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Application of Structured Nursing Pathway Based on Key Time Nodes in Perioperative Care of Patients Undergoing Painless Induced Abortion

Yanan Ni, Jing Wu, Liqing Shi, Lei Wu*

Affiliated Women's Hospital of Jiangnan University, Wuxi 214002, Jiangsu, China

Author to whom correspondence should be addressed.

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Abstract: *Objective:* To explore the application effect of a structured nursing path based on key time nodes in the perioperative period of patients receiving painless abortion. *Methods:* A total of 116 patients who planned to have painless abortion in the family-planning department from March 2024 to March 2025 were selected. They were divided into two groups by simple random sampling, with 58 cases in each group. The control group received routine perioperative nursing care, while the intervention group received structured nursing care based on key time nodes. The two groups were compared in terms of psychological status, incidence of postoperative complications, nursing satisfaction and rehabilitation progress. *Results:* On the 3rd day after surgery, the SAS and SDS scores of the observation group were lower than those of the control group ($P<0.05$). The total incidence of postoperative complications in the observation group was 5.17%, obviously lower than 20.69% in the control group ($P<0.05$). The total nursing satisfaction rate of the observation group was 98.28%, significantly higher than 86.21% in the control group ($P<0.05$). Besides, the duration of postoperative vaginal bleeding, abdominal pain and uterine recovery time in the observation group were better than those in the control group ($P<0.05$). *Conclusion:* The structured nursing path based on key time nodes can effectively improve the psychological state of patients undergoing painless abortion, reduce complications, speed up rehabilitation and raise nursing satisfaction.

Keywords: Key time nodes; Structured nursing path; Painless abortion; Perioperative nursing; Rehabilitation effect

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1. Introduction

Painless abortion is a common minimally-invasive operation to end early pregnancy in clinical practice, and it is the first choice for most women with unintended pregnancy. Still, this operation is an invasive procedure.

Its trauma will affect women's reproductive health and mental state. During the perioperative period, patients tend to feel anxious and fearful because they know little about the operation process and worry about the influence on fertility. Meanwhile, risks of postoperative complications such as bleeding, infection and intrauterine adhesion will interfere with rehabilitation and quality of life[1]. Routine perioperative nursing mostly depends on clinical experience. Its nursing content is scattered without clear time points. It can hardly meet patients' physical and psychological needs before and after surgery fully, which leads to uneven nursing effects[2]. The structured nursing path sets standardized and unified nursing procedures according to disease features and patients' needs along the time axis. It makes clear nursing priorities in each stage, avoids missing nursing work and improves the consistency of nursing service[3]. On this basis, this study aims to discuss the effect of this nursing model in perioperative nursing for patients with painless abortion.

2. Materials and methods

2.1. General information

116 patients preparing for painless abortion in the family-planning department from March 2024 to March 2025 were chosen as research subjects. They were split into the control group and the observation group by simple random sampling, with 58 patients in each group.

Inclusion criteria: (1) Intrauterine pregnancy confirmed by ultrasound, gestational age from 6 to 12 weeks; (2) Age from 18 to 40 years old; (3) No contraindications for painless abortion; (4) Willing to undergo surgery and nursing intervention, and signed informed consent; (5) No history of mental illness, able to complete scale assessment and follow-up.

Exclusion criteria: (1) Patients with severe organic diseases; (2) Patients with ≥ 2 abortions or cesarean sections; patients with gestational complications such as hypertension and diabetes during pregnancy; (3) Patients unable to finish follow-up after surgery or dropping out of the research halfway.

Baseline data: In the control group, the average age was (28.61 ± 4.32) years old, ranging from 19 to 40 years old; the average gestational age was (10.13 ± 0.69) weeks. In the observation group, the average age was (29.12 ± 4.57) years old, ranging from 18 to 40 years old; the average gestational age was (9.94 ± 1.03) weeks. There was no obvious difference in baseline data between the two groups ($P > 0.05$), so they could be compared in the study.

2.2. Methods

2.2.1. Control group

The control group received routine perioperative nursing. The detailed contents were as follows. Before surgery: After admission, nurses told patients the operation time and preoperative notes, briefly introduced the operation process and anesthesia methods, and answered patients' questions. Nurses helped finish preoperative examinations and got patients ready for surgery. During surgery: Operating-room nurses assisted with the operation, monitored patients' vital signs, and sent patients back to the ward after surgery. After surgery: Nurses told patients how to deal with common symptoms such as postoperative bleeding and abdominal pain. They gave guidance on diet, rest, activity, and personal hygiene. Medicines were given as ordered. Nurses observed vaginal bleeding volume and abdominal pain degree. Patients could leave the hospital when their vital signs were stable and they felt no obvious discomfort.

2.2.2. Observation group

The observation group received a structured nursing path based on key time nodes. Starting from admission after diagnosis and ending on the 7th day after discharge, four key time nodes were divided to make standard nursing path sheets, combined with personalized intervention and health management. Specific measures are shown below:

(1) From admission after diagnosis to one day before surgery: Adopt "one-on-one communication plus situational health education". According to patients' education level, explain the process of painless abortion and the safety of anesthesia in plain language. Simple picture brochures were used to show the operation position and key cooperation points, avoiding hard professional terms. Personalized health brochures were handed out, marking rehabilitation focuses and warning signs of potential complications matching patients' gestational age and age. Mental assessment was carried out at the same time. The short version of the Self-Rating Anxiety Scale (SAS) was used for quick screening of emotional state. For patients with anxiety and fear, besides sharing similar recovery cases, guidance on mindfulness breathing exercises was provided. Nurses listened patiently and provided emotional support to ease bad feelings and build confidence in treatment. Personalized nursing plans were made based on examination results. For example, special diet lists were given for patients with mild anemia, clarifying the timing of iron supplements and intake of high-quality protein. One day before surgery, nurses informed patients of fasting and water-prohibiting time and surgery schedule. Patients were told not to stay up late or catch a cold. They were taught deep-breathing relaxation skills and simulated preoperative cooperation practice to reduce nervousness during surgery. All preoperative preparations were checked to make sure everything was ready.

(2) From returning to the ward after surgery to discharge: Carry out "precise monitoring plus step-by-step rehabilitation" intervention. After patients came back to the ward, duty nurses immediately checked consciousness and vital signs, examined vaginal bleeding and abdominal pain, helped patients take a knee-bending position, and told patients the surgery went well to relieve postoperative nervousness. Within 2 hours after surgery, vital signs, bleeding and abdominal pain were assessed every 30 minutes. Numeric Rating Scale (NRS) was used to record abdominal pain. Multi-frequency pulse therapy was given when NRS score ≤3 points. Doctors would be informed for symptomatic treatment when score>3 points. Assessment frequency changed to every 2 hours when vital signs became stable. When patients fully woke up without nausea or vomiting, they could drink a small amount of warm water first. Warm and easy-to-digest food could be taken if no discomfort occurred. Short-term diet plans were made based on personal taste, listing specific cold, greasy, and blood-activating foods that should be avoided. Step-by-step activity guidance was given according to physical condition. Patients were guided to turn over in bed within 1-2 hours after surgery. They could get out of bed for proper activities 2 hours later. Activity amount increased little by little to boost uterine contraction. Staff stayed with patients during activities to prevent sudden position changes and observe their complexion and dizziness for safety. Patients were guided to change underwear and perineal pads in time to keep the vulva clean. When giving medicines according to the doctor's advice, nurses marked the time taken, dosage, and points for observing side effects. Conditions such as fever and increased bleeding were closely watched. Any abnormal situation would be handled in time.

(3) On the day of discharge: Implement "full assessment plus personalized health prescription" intervention.

Physical recovery and nursing compliance were fully assessed. Targeted discharge guidance was provided. Clear requirements about diet, rest, no tub bath and no sex within one month after surgery were explained. Reasonable rest suggestions were offered combined with patients' jobs. Emergency contact information and re-examination time were provided. Contraception guide brochures were handed out. Suitable contraceptive methods were recommended according to patients' age and fertility needs. Nurses showed the correct use of condoms on site and explained notes for taking short-term oral contraceptives, to strengthen contraception awareness and lower the risk of repeated abortion. Rehabilitation follow-up brochures were given. Patients were told to record vaginal bleeding and abdominal pain for accurate feedback in follow-up.

(4) On the 3rd and 7th day after discharge: Conduct "hierarchical follow-up plus dynamic guidance". Telephone follow-up was done on the 3rd day after discharge. Nurses focused on rehabilitation and implementation of nursing measures and answered questions about diet and medicine. For patients with poor compliance, key points were stressed and intervention plans were adjusted. Re-examination was arranged on the 7th day. Nurses helped patients complete an ultrasound to evaluate uterine recovery. Rehabilitation guidance would be adjusted according to test results. For instance, guidance on more abdominal massage and diet adjustment was given for patients with slow uterine recovery. Mental state would be assessed again. Extra psychological counseling would be offered when necessary to guarantee rehabilitation outcomes.

2.3. Observation indicators

(1) Psychological state: Self-Rating Anxiety Scale (SAS) and Self-Rating Depression Scale (SDS) were used to evaluate patients' mental state one day before surgery and on the 3rd day after surgery. Both scales contained 20 items with 4-level scoring (1-4 points). Total scores ranged from 20 to 80. Higher scores meant more serious anxiety and depression.

(2) Incidence of postoperative complications: The occurrence of infection, intrauterine hematoma, worsened abdominal pain, and prolonged vaginal bleeding within one month after surgery in the two groups was counted.

(3) Nursing satisfaction: A self-made nursing satisfaction scale was used to assess satisfaction on the 3rd day after surgery. Results were divided into four levels: very satisfied, satisfied, basically satisfied and dissatisfied. The total score of the scale was 25-100 points. Total satisfaction rate=(cases of very satisfied + satisfied + basically satisfied)/total cases ×100%.

(4) Postoperative rehabilitation progress: Record the duration of postoperative vaginal bleeding, abdominal pain and uterine recovery time of patients in two groups.

2.4. Statistical methods

Data in this study included enumeration data and measurement data. Enumeration data such as complication rate and nursing satisfaction were expressed as numbers (percentages) and tested by the Chi-square test. Measurement data such as psychological state and rehabilitation indexes were expressed as mean ± standard deviation (SD) and tested by the t-test. SPSS 26.0 software was used for statistical analysis. $P < 0.05$ meant the difference had statistical significance.

3. Results

3.1. Psychological state

One day before surgery, there was no obvious difference in SAS and SDS scores between the two groups ($P > 0.05$). On the 3rd day after surgery, scores of both groups dropped compared with pre-operation. The scores of the observation group were much lower than those of the control group ($P < 0.05$). See **Table 1**.

Table 1. Comparison of psychological state scores before and after surgery between two groups (mean ± SD, score)

Group	SAS score 1 day before surgery	SAS score 3 days after surgery	SDS score 1 day before surgery	SDS score 3 days after surgery
Control group	56.32 ± 4.89	42.15 ± 3.67*	55.78 ± 5.12	41.83 ± 4.05*
Observation group	55.97 ± 5.03	35.62 ± 3.21*	55.41 ± 4.98	34.98 ± 3.56*
t value	0.516	4.331	0.598	4.506
P value	> 0.05	< 0.05	> 0.05	< 0.05

Note: * stands for obvious intra-group difference between pre-operation and post-operation, $P < 0.05$.

3.2. Incidence of postoperative complications

Within one month after surgery, the total complication rate of the observation group was 5.17%, obviously lower than 20.69% in the control group ($P < 0.05$). See **Table 2**.

Table 2. Comparison of postoperative complication incidence between two groups [n,(%)]

Group	Infection	Intrauterine hematoma	Worsened abdominal pain	Prolonged vaginal bleeding	Total incidence
Control group (n=58)	3(5.17)	4(6.90)	2(3.45)	3(5.17)	12(20.69)
Observation group (n=58)	1(1.72)	1(1.72)	0(0.00)	1(1.72)	3(5.17)
χ^2 value	-	-	-	-	6.743
P value	-	-	-	-	< 0.05

3.3. Nursing satisfaction

The total satisfaction rate of the observation group was 98.28%, higher than 86.21% of the control group ($P < 0.05$). Its average satisfaction score was also higher ($P < 0.05$). See **Table 3**.

Table 3. Comparison of nursing satisfaction between two groups

Group	Very satisfied [n,(%)]	Satisfied [n,(%)]	Basically satisfied [n,(%)]	Dissatisfied [n,(%)]	Total satisfaction rate [n,(%)]	Average score (point)
Control group (n=58)	22(37.93)	20(34.48)	8(13.79)	8(13.79)	50(86.21)	82.35 ± 6.78
Observation group (n=58)	38(65.52)	16(27.59)	3(5.17)	1(1.72)	57(98.28)	93.67 ± 4.21
t/χ^2 value	-	-	-	-	5.921	5.314
P value	-	-	-	-	< 0.05	< 0.05

3.4. Postoperative rehabilitation progress

The duration of vaginal bleeding, abdominal pain and uterine recovery time in the observation group were shorter than those in the control group ($P < 0.05$). See **Table 4**.

Table 4. Comparison of postoperative rehabilitation indexes between two groups (mean ± SD)

Group	Duration of vaginal bleeding (d)	Duration of abdominal pain (h)	Uterine recovery time (d)
Control group	7.23 ± 1.56	4.87 ± 1.02	18.56 ± 2.34
Observation group	4.58 ± 1.21	1.92 ± 0.27	13.24 ± 1.89
t value	6.891	3.107	7.953
P value	< 0.05	< 0.05	< 0.05

4. Discussion

Patients receiving painless abortion tend to suffer anxiety and depression due to surgical trauma and worries about reproductive health. A poor mental state may affect uterine contraction, increase postoperative discomfort, and cause a bad cycle for recovery. Therefore, perioperative nursing should include both physical care and psychological support [4]. This study compared routine perioperative nursing with a structured nursing path based on key time nodes for painless-abortion patients. Results showed that this structured nursing path could greatly improve patients' perioperative outcomes.

In terms of improving mental state, SAS and SDS scores of the observation group were lower on the 3rd postoperative day. This proved that the structured nursing path worked better for mental intervention than traditional perioperative nursing. Psychological guidance in routine nursing usually gave general suggestions without targeted help [5]. In the structured nursing path, one-on-one communication started right after diagnosis. Popular-science explanations matched patients' education background. Sharing similar recovery cases relieved anxiety. Relaxation training was taught before surgery. Patients were told about good operation results right after surgery. Full-cycle mental support was provided to prevent bad feelings from disturbing recovery.

The observation group had a lower complication rate and better rehabilitation indexes. This suggested that a structured nursing path was effective for physical intervention. This nursing model divided care into four stages according to time sequence. Personalized preoperative preparation guaranteed operation safety. Close monitoring, positioning care, diet, and activity guidance after surgery helped detect bleeding and infection in time. Standard vulva care and medication management lowered complication risks. It also promoted uterine contraction, shortened bleeding time, abdominal pain duration and uterine recovery cycle [6]. On the contrary, postoperative guidance in routine nursing lacked continuous follow-up. Patients might have slow recovery or get complications because of insufficient knowledge.

As for nursing satisfaction, the total satisfaction rate of the observation group reached 98.28%, higher than the control group. The reason was that the structured nursing path put patients at the center. Measures including one-on-one talk, personalized guidance and post-discharge follow-up met patients' physical and mental demands in different stages. Patients gained more trust and recognition toward nursing service [7]. Routine nursing mainly finished basic work and paid little attention to individual differences, so it could not fully satisfy patients' psychological needs [8].

5. Conclusion

To sum up, the structured nursing path based on key time nodes standardizes perioperative nursing procedures and accurately meets patients' needs in each stage. It can ease negative feelings, cut down complication risks, speed up recovery and improve nursing satisfaction for patients with painless abortion. This nursing mode fits the perioperative needs of such patients, so it is worth clinical promotion.

Disclosure statement

The authors declare no conflict of interest.

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