



Effect of Midwife-Led Family-Accompanied Delivery Room Care on the Delivery Mode of Primiparas

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Abstract: **Objective:** To investigate the effect of midwife-led, family-accompanied delivery room care on delivery mode, labor duration, and pain intensity in primiparas. **Methods:** A total of 180 primiparas scheduled for vaginal delivery were enrolled and divided into an accompaniment group (n=86) and a routine care group (n=94) based on preference. The routine group received standard delivery care. The accompaniment group received midwife-led, one-to-one care in a dedicated, home-like delivery room with a family member present throughout labor and delivery. Delivery mode, durations of the first, second, and third stages of labor, pain intensity (assessed by Visual Analogue Scale, VAS), and adverse pregnancy outcomes were compared between the two groups. **Results:** The vaginal delivery rate in the accompaniment group (96.51%) was significantly higher than that in the routine group (76.60%, $P < 0.05$). The durations of the first and second stages of labor were significantly shorter in the accompaniment group (8.28 ± 0.75 h; 52.07 ± 16.83 min) compared to the routine group (10.86 ± 1.04 h; 63.73 ± 22.96 min, both $P < 0.05$). The VAS pain score during delivery was significantly lower in the accompaniment group (7.14 ± 0.53) than in the routine group (8.22 ± 0.72 , $P < 0.05$). The incidence of adverse pregnancy outcomes in the accompaniment group (5.81%) was significantly lower than that in the routine group (15.96%, $P < 0.05$). **Conclusion:** For primiparas, implementing midwife-led, family-accompanied delivery room care can effectively increase the rate of vaginal delivery, shorten the duration of the first and second stages of labor, alleviate pain during delivery, and improve pregnancy outcomes.

Key words: Family-Accompanied ; Care; Primipara; Delivery mode; Stages of labor; Pain level

Introduction

Childbirth is an inevitable physiological process for women with reproductive needs. During this process, prolonged pain stimulation and hormonal fluctuations may induce emotional changes in parturients, thereby influencing their mode and course of delivery [1], [2]. Such emotional fluctuations—particularly tension, fear, and anxiety—are more pronounced in primiparas who lack childbirth experience. Creating a family-like environment and allowing family members to accompany the parturient are effective measures to alleviate psychological pressure and promote a smooth delivery. In recent years, with changes in healthcare models, family-accompanied childbirth has gained popularity among pregnant women; however, the effectiveness of this model still requires further validation. Therefore, this study selected primiparas scheduled for vaginal delivery to investigate the effect of midwife-led, family-accompanied delivery room care on delivery mode, labor duration, and pain intensity. The findings are reported as follows.

1. Data and Methods

1.1 Clinical Data

A total of 180 primiparas scheduled for vaginal delivery at our hospital from January 2023 to March 2024 were enrolled. Based on their preferences, they were divided into the accompaniment group (86 cases) and the routine group (94 cases). No statistically significant differences were observed in the baseline characteristics between groups ($P > 0.05$), indicating comparability. This study was approved by the institutional medical ethics committee.

1.2 Inclusion and Exclusion Criteria

Inclusion criteria: primiparas; singleton pregnancy confirmed by prenatal ultrasound; indication for vaginal delivery with gestational age ≥ 37 weeks; both the parturient and family members fully understood and consented to the study, and signed informed consent forms for delivery and nursing models.

Exclusion criteria: communication barriers or mental disorders; comorbidities such as gestational diabetes or gestational hypertensive disorders; conception via artificial insemination, prolonged labor, or precipitous labor. The exclusion criteria for this study were specifically defined as follows: 1) Communication barriers or clinically diagnosed mental disorders that would prevent cooperation with the study intervention and assessments; 2) Comorbidities definitively influencing the labor process and outcomes, such as gestational diabetes or gestational hypertensive disorders; 3) Conception achieved via assisted reproductive technology; 4) Abnormal labor duration, defined as total labor exceeding 24 hours (prolonged labor) or lasting less than 3 hours (precipitous labor).



1.3 Methods

1.3.1 Routine Group

Routine delivery care was provided. After admission, the responsible nurse introduced the ward environment. On the day of admission, the midwife conducted a comprehensive assessment of the primipara, particularly the feasibility of vaginal delivery, and provided detailed explanations regarding the delivery process, cooperation methods, precautions, and postpartum care, thereby alleviating antenatal anxiety. When entering the active phase, the primipara was transferred to the delivery room. The midwife provided routine monitoring, closely observing blood pressure, heart rate, fetal heart rate, and oxygen saturation, assisted with maintaining a comfortable position, and performed appropriate interventions according to pain levels. Delivery proceeded according to standard procedures after full cervical dilation.

1.3.2 Accompaniment Group

Midwife-led, family-accompanied delivery room care was implemented, as follows:

- ① Preparation for family-accompanied delivery. Midwives received training in the family-accompanied delivery model and were allowed to participate only after passing assessments. Perinatal health education was provided prenatally to families willing to participate.
- ② Establishment of a family-accompanied delivery room. A separate delivery room was arranged to simulate a home-like environment. Throughout the entire process, from admission to completion of delivery, transfer was unnecessary. One-to-one midwife care was provided, covering labor, delivery, and postpartum recovery.
- ③ Care during delivery. Prenatal assessment and education were identical to those in the routine group. After examinations and assessments, individualized care plans were developed according to the parturient's condition and needs. The midwife communicated patiently with the primipara and her family, providing targeted psychological support to address negative emotions. During the second stage of labor, vital signs, uterine contractions, cervical dilation, and pain levels were closely monitored. The primipara was assisted with dietary and fluid intake, comfortable positioning, and guided in rhythmic breathing. During the third stage of labor, the primipara was instructed to use abdominal pressure correctly to facilitate rapid fetal expulsion.

1.4 Observation Indicators and Evaluation Criteria

- ① The delivery mode of both groups was recorded.
- ② The durations of the first, second, and third stages of labor were recorded.
- ③ Pain levels were assessed using the Visual Analogue Scale (VAS; 0–10 points), with higher scores indicating more severe pain.
- ④ Adverse pregnancy outcomes were recorded.

1.5 Statistical Analysis

SPSS 27.0 statistical software was used for data analysis. Measurement data were expressed as mean \pm standard deviation (\pm s) and analyzed using the t-test. Categorical data were expressed as n (%) and analyzed using the χ^2 test. A value of $P < 0.05$ indicated statistical significance.

2 Results

2.1 Comparison of delivery modes between the two groups

The rate of vaginal delivery in the accompaniment group was higher than that in the routine group, while the rates of forceps-assisted delivery and cesarean section were both lower than those in the routine group ($P < 0.05$). See Table 1.

Table 1 Comparison of delivery modes between the two groups of primiparas [n (%)]

Group	n	Vaginal delivery	Forceps-assisted delivery	Cesarean section
Routine group	94	72 (76.60)	15 (15.96)	7 (7.45)
Accompaniment group	86	83 (96.51) ^a	2 (2.33) ^a	1 (1.16) ^a
χ^2		14.895	9.758	4.176
P		0	0.002	0.041

Note: compared with the routine group, ^a $P < 0.05$.

2.2 Comparison of labor duration and pain intensity between the two groups

The durations of the first and second stages of labor were shorter in the accompaniment group than in the routine group, and the VAS score during delivery was lower in the accompaniment group ($P < 0.05$). There was no statistically significant difference between the two groups in the duration of the third stage of labor ($P > 0.05$). See Table 2.

Table 2 Comparison of labor duration and pain intensity between the two groups of primiparas (\pm s)

Group	n	First stage (h)	Second stage (min)	Third stage (min)	VAS score (points)
Routine group	94	10.86 \pm 1.04	63.73 \pm 22.96	7.92 \pm 1.03	8.22 \pm 0.72
Accompaniment group	86	8.28 \pm 0.75 ^a	52.07 \pm 16.83 ^a	7.67 \pm 0.73	7.14 \pm 0.53 ^a
t		18.936	3.856	1.863	11.373
P		0	0	0.064	0

Note: compared with the routine group, ^a $P < 0.05$.

2.3 Comparison of adverse pregnancy outcomes between the two groups

The incidence of adverse pregnancy outcomes in the accompaniment group was 5.81% (5/86), which was lower than that in the routine group at 15.96% (15/94). The difference was statistically significant ($\chi^2 = 4.679$, $P = 0.031 < 0.05$).

3 Discussion

The birth canal, uterine forces, maternal condition, and fetal size are the four major factors influencing delivery outcomes. Among these, maternal condition and uterine forces are variable factors that greatly affect delivery outcomes [3]–[5]. Primiparas often experience more intense pain during labor, which increases physical exhaustion and affects uterine forces and labor progress [6]–[8]. Under routine delivery models, midwives primarily focus on monitoring the parturient, the newborn, and the progress of labor. The study by Yang Jianmin et al. [9] showed that family participation in the delivery process can shorten the second stage of labor and improve delivery outcomes. Zeng Wanting [10] established a family delivery room, and the results were consistent with those of Yang Jianmin et al., showing that the second stage of labor was significantly shortened and delivery outcomes were clearly improved in the observation group.

In the present study, the family-accompanied delivery room was a single room arranged to create a home-like atmosphere, enabling primiparas to better understand childbirth as a natural physiological process. Compared with the routine delivery model, the entire delivery process was accompanied by continuous, one-to-one care from a dedicated midwife, along with the presence of a family member, providing psychological support to the parturient. In addition, the parturient did not need to be transferred from the ward to the delivery room, thereby protecting privacy. The results of this study showed that the vaginal delivery rate in the accompaniment group was significantly higher than that in the routine group. The durations of the first and second stages of labor were shorter, and the VAS pain score during delivery was lower in the accompaniment group, with statistically significant differences ($P < 0.05$). This suggests that the family-accompanied delivery model can shorten labor duration and increase the rate of vaginal delivery. The study further compared delivery outcomes between the two groups and found that the incidence of adverse pregnancy outcomes was lower in the accompaniment group than in the routine group, with a statistically significant difference ($P < 0.05$).

This study has several limitations. First, group allocation was based on participant preference rather than randomization, which may introduce selection bias despite the lack of significant differences in baseline characteristics. Future studies employing a randomized controlled design would provide stronger evidence. Second, the outcome assessors (e.g., midwives recording labor duration and determining delivery mode) were not blinded to the group allocation, which introduces a potential for measurement bias, although objective indicators were used. Finally, as a single-center study with a limited sample size, the generalizability of the findings may be constrained. Future multi-center, large-sample randomized controlled trials are warranted to further validate these results.

In conclusion, the findings of this study indicate that the implementation of midwife-led, family-accompanied delivery room care represents a beneficial and feasible model for improving childbirth experiences and outcomes among primiparas. The intervention was associated with a statistically significant increase in the rate of vaginal delivery, a reduction in the durations of the first and second stages of labor, decreased subjective pain intensity, and a lower incidence of adverse pregnancy outcomes compared to routine delivery care. These results suggest that the provision of continuous, one-to-one midwifery support within a family-oriented, home-like environment effectively addresses the psychological and physical challenges of labor, thereby promoting physiological birth processes. While the study's non-randomized design warrants cautious interpretation, the outcomes align with the growing body of evidence supporting person-centered, holistic maternity care models. Therefore, the integration of this family-accompanied delivery approach into standard obstetric practice is recommended to enhance maternal satisfaction, optimize delivery outcomes, and support the well-being of both mother and child. Future research utilizing randomized controlled designs with blinded outcome assessment is encouraged to further establish causal efficacy and explore the long-term impacts of such care on postpartum recovery and neonatal health.

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