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Perceived Benefit of Midwifery-Led Intervention and Its Association with Maternal and Neonatal Outcomes: A Statistical Analysis

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KEYWORDS

Midwifery-led care, maternal health, neonatal, healthcare communication.

ABSTRACT:

Background. Midwifery-led models of care have been demonstrated to optimize maternal and neonatal health outcomes. Yet, women's perceptions of such models might impact their effectiveness and may be varied based on their clinical experience. This research explores what determines demographic, clinical, and socio-economic influences on perceptions of midwifery-led models of care and whether such perceptions match true maternal and neonatal outcomes.

Methods. Cross-sectional data were obtained in 500 women undergoing midwifery-led antenatal and intrapartum care. Participants were divided into three categories based on self-reported perception: Not Helpful (n = 178), somewhat Helpful (n = 164), and Very Helpful (n = 158). Demographic factors, clinical markers, neonatal complications, and maternal postpartum outcomes were recorded. Chi-square tests were employed in categorical variables, and ANOVA was employed to determine differences in continuous variables by perception groups.

Results. No associations of significance were discovered between demographic factors including age, education, BMI, income, or occupation and perception of midwifery-led care ($p > 0.05$). However, clinical outcomes had a significant impact. Negative neonatal outcomes, i.e., preterm birth ($p = 0.03$) and respiratory distress ($p < 0.05$), were attributed to more negative expectations. Likewise, maternal complications in the form of postpartum haemorrhage ($p = 0.04$) and postpartum exhaustion ($p = 0.06$) were attributed to lower confidence in midwifery-led care. Mode of delivery had no correlation ($p = 0.45$).

Conclusion. Clinical outcomes, not demographic or socio-economic variables, influence women's attitudes towards midwifery-led care. Fostering improved communication, patient education, and emergency preparedness could contribute to establishing trust and enhancing acceptance of this model.

1. Introduction

Maternal healthcare interventions play a crucial role in improving pregnancy outcomes and ensuring the well-being of both mothers and newborns. Pregnancy and childbirth are critical periods that require comprehensive care to prevent complications and optimize maternal and neonatal health [1]. Over the years, different models of maternal healthcare have been developed to provide necessary support, among which midwifery-led care has gained increasing recognition for its holistic and patient-cantered approach. Midwifery-led interventions are based on the philosophy of continuity of care, individualized support, and evidence-based clinical practices that promote normal physiological birth while

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ensuring maternal safety and well-being [2]. Several studies have highlighted that midwifery-led care models are associated with improved pregnancy experiences, reduced rates of medical interventions, and better maternal satisfaction compared to physician-led models [3]. Despite these advantages, the perception of midwifery-led care among women varies significantly, which can influence their decision to seek and adhere to such care models [4].

Midwifery-Led Models and Their Effectiveness

Midwifery-led care has been widely recognized as a beneficial approach for low-risk pregnancies, offering comprehensive antenatal, intrapartum, and postnatal care with a focus on non-interventionist, woman-cantered support. Studies indicate that women receiving midwifery-led care experience fewer obstetric interventions, such as caesarean sections, episiotomies, and instrumental deliveries, compared to those under obstetric-led care [5]. Additionally, midwifery care models have been linked to shorter hospital stays, reduced medical costs, and improved neonatal outcomes, including higher APGAR scores and reduced neonatal intensive care unit (NICU) admissions [6]. One of the distinguishing features of midwifery-led models is the emphasis on shared decision-making, patient education, and emotional support, which are essential for enhancing women's confidence during childbirth [7]. Unlike traditional medical models that often focus on clinical interventions, midwifery-led care promotes natural birth processes and minimizes unnecessary medicalization, leading to higher maternal satisfaction and better psychological well-being postpartum [8]. However, the effectiveness of midwifery-led models is largely dependent on women's acceptance, awareness, and trust in the approach, which can be influenced by socioeconomic, cultural, and personal factors [9].

Perceptions of Midwifery-Led Interventions

Despite the documented benefits, women's perception of midwifery-led care varies widely, and their acceptance of such interventions is often shaped by multiple factors, including education, cultural beliefs, previous birth experiences, and healthcare accessibility. Some women perceive midwifery-led care as a safe, supportive, and empowering option, while others associate it with inadequate medical intervention, increased risks, and limited emergency preparedness [10]. The level of trust in midwifery services is particularly influenced by cultural norms and healthcare policies. In many developing countries, midwifery-led care is underutilized due to low awareness, limited institutional support, and strong preferences for physician-supervised births [11]. In contrast, countries like the Netherlands, the UK, and New Zealand, where midwifery-led models are well-integrated into the healthcare system, have reported higher maternal satisfaction and better clinical outcomes compared to physician-led maternity care [12]. The role of education and socioeconomic status is also critical in shaping perceptions. Studies have shown that women with higher education levels and better access to healthcare resources are more likely to opt for midwifery-led care and report positive birth experiences [13]. Conversely, those from low-income backgrounds or marginalized communities may have limited exposure to midwifery-led services and rely more on hospital-based interventions, often perceiving midwifery as a less competent alternative to physician-led care [4].

Clinical Outcomes and Perceived Effectiveness

Understanding whether perceptions align with actual clinical outcomes is crucial in evaluating the overall impact of midwifery-led interventions. While clinical data consistently support midwifery-led care as an effective model for improving maternal and neonatal health, individual perceptions do not always correlate with these findings. Some women, particularly those with complicated pregnancies or prior adverse birth experiences, may feel more secure under obstetric-led care, even when their pregnancy qualifies as low-risk [14].

Several studies have found contradictions between subjective perception and clinical reality. For example, while midwifery-led care reduces the likelihood of preterm births, low birth weight, and emergency caesarean sections, some women perceive it as a model that lacks medical preparedness for emergency situations [15]. This discrepancy highlights the need for better communication, patient education, and policy interventions to bridge the gap between perception and evidence-based benefits.

Additionally, maternal satisfaction and psychological well-being are key indicators of the success of midwifery-led models. Women who receive continuous care from the same midwife or team throughout

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pregnancy and delivery report lower levels of stress, anxiety, and postpartum depression, reinforcing the emotional and psychological benefits of this model [16]. However, in settings where midwifery services are fragmented, understaffed, or under-resourced, the quality of care may suffer, leading to negative perceptions and reduced uptake [17].

2. Rationale for the Study

Given the increasing global focus on improving maternal healthcare and reducing childbirth-related complications, understanding how perceptions of midwifery-led interventions influence healthcare choices is vital [18]. While numerous studies have established the clinical effectiveness of midwifery-led care, research exploring the sociocultural, economic, and psychological factors influencing women's perception of these models remains limited [19].

This study aims to bridge this gap by analysing how demographic, clinical, and socio-economic factors correlate with the perception of midwifery-led interventions and whether these perceptions align with clinical outcomes. By examining participants' subjective experiences alongside actual maternal and neonatal health indicators, this research provides valuable insights into the barriers and facilitators of midwifery-led care adoption. The findings from this study will contribute to the development of targeted educational interventions, policy reforms, and healthcare strategies to enhance maternal healthcare services. Midwifery-led care has the potential to transform maternal healthcare by promoting positive birth experiences, reducing unnecessary interventions, and improving maternal and neonatal health outcomes [20]. However, the effectiveness and widespread adoption of this model depend significantly on women's perceptions, trust, and healthcare accessibility [21]. This study seeks to explore the complex interplay between perception, clinical outcomes, and socio-economic influences, offering a comprehensive analysis of midwifery-led interventions and their impact on maternal healthcare and fatal health care.

3. Methodology

Study design and participants

This study employed a cross-sectional design to evaluate the perceived benefits of midwifery-led interventions and their association with maternal and neonatal health outcomes. A total of 1000 anaemic pregnant women were enrolled, among them 500 were received midwifery-led care. To analyse the impact of perception on clinical outcomes, participants were stratified into three distinct groups based on their subjective evaluation of the intervention: Not Helpful (n=178), somewhat Helpful (n=164), and Very Helpful (n=158). This categorization enabled a comparative analysis of maternal and neonatal outcomes in relation to the perceived effectiveness of midwifery-led interventions. The study strictly adhered to ethical guidelines and regulatory protocols, ensuring voluntary participation and obtaining informed consent from all individuals prior to data collection.

Inclusion and exclusion criteria

To maintain the reliability and relevance of the findings, specific inclusion and exclusion criteria were applied. Participants eligible for the study included pregnant women who had undergone midwifery-led care during pregnancy and delivery. Additionally, only those who provided informed consent and agreed to share demographic, clinical, and perception-related data were considered. Women with incomplete medical records, missing follow-up data, or those who had experienced severe pregnancy-related complications requiring exclusive specialist intervention were excluded from the study. This exclusion ensured that confounding factors, such as high-risk pregnancies requiring intensive medical intervention, did not bias the analysis of midwifery-led interventions.

Data collection

A structured questionnaire and medical records served as the primary sources of data collection, allowing for a comprehensive assessment of variables related to maternal and neonatal health. The demographic variables recorded included age, body mass index (BMI), family income, education level, occupation, and type of family structure to examine the socio-economic and physiological backgrounds of participants. Clinical parameters such as gestational age, mode of delivery, APGAR scores at birth, and neonatal complications were obtained from hospital records to assess perinatal outcomes. Maternal health parameters, including postpartum complications, common medical conditions (such as anaemia, hypertension, gestational diabetes,

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preeclampsia, and infections), and the need for additional postpartum support, were also documented to evaluate potential health risks associated with childbirth. Dietary habits, categorized as vegetarian, non-vegetarian, or mixed diet, were recorded to explore any associations with pregnancy outcomes. Lastly, participants' perception of midwifery-led interventions was assessed using a structured scale, where they rated their experience as Not Helpful, Somewhat Helpful, or Very Helpful. This self-reported measure provided insights into the subjective evaluation of care and its perceived effectiveness in influencing pregnancy and birth outcomes.

Statistical analysis

The collected data were systematically analysed using SPSS software to derive meaningful interpretations and associations. Descriptive statistics, including mean, standard deviation, frequency, and percentage distributions, were employed to summarize participant characteristics and provide an overview of the dataset. To determine statistical significance, inferential tests were performed. Chi-square tests were applied to examine associations between categorical variables, such as neonatal complications, medical conditions, and family structure, with the perception of midwifery-led interventions. Additionally, one-way analysis of variance (ANOVA) was conducted to compare continuous variables, including age, BMI, and family income, across the three perception groups. A p-value of less than 0.05 ($p < 0.05$) was considered statistically significant, indicating a meaningful relationship between the analysed variables and perception categories**.**

Ethical considerations

The study received approval from the institutional ethics review board, ensuring compliance with ethical standards and participant rights. All individuals were informed about the objectives of the study, their role in participation, and the confidentiality of their personal information. Written informed consent was obtained from each participant, emphasizing voluntary participation and the right to withdraw at any stage without consequence. To uphold data privacy, all collected information was anonymised and securely stored, with access restricted to authorized researchers only. Ethical principles, including beneficence, non-maleficence, autonomy, and justice, were maintained throughout the study to safeguard the well-being and dignity of participants.

4. Results

The study included 500 participants categorized based on their perception of midwifery-led intervention: Not Helpful (n=178), somewhat Helpful (n=164), and Very Helpful (n=158). The mean age was comparable across groups (Not Helpful: 29 ± 6.5 years, Somewhat Helpful: 29 ± 6.9 years, Very Helpful: 28 ± 6.6 years). Similarly, no significant differences were observed in BMI (p=0.17) and average family income levels across the groups (p=0.93) (Table 1).

Table 1. Demographic summary table

Category	Value / Count
Mean Age (Years)	29.0
Private employee	906.0
Housewife	875.0
Daily wage worker	872.0
Government employee	847.0
Min Income	3015.0
Max Income	24987.0
Mean Income	13873.64
Higher	911.0
No formal education	899.0
Primary	848.0
Secondary	842.0
Joint	1203.0
Nuclear	1158.0
Extended	1139.0
Vegetarian	1195.0
Mixed diet	1192.0
Non-vegetarian	1113.0

Educational attainment was evenly distributed among the three perception groups, with no formal education, primary, secondary, and higher education levels being proportionately represented (Table 2).

Table 2. Education level distribution

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Education Level	Not Helpful	Somewhat Helpful	Very Helpful
No Formal Education	44	38	41
Primary	47	47	41
Secondary	51	36	37
Higher	40	47	43

In terms of occupation, daily wage workers were the most common category (n=142), followed by private employees (n=127), housewives (n=122), and government employees (n=109) (Table 3).

Table 3. Occupation distribution

Occupation	Not Helpful	Somewhat Helpful	Very Helpful
Housewife	44	40	38
Private Employee	50	42	35
Daily Wage Worker	47	44	52
Government Employee	37	38	33

No significant association was found between occupational status and perception of midwifery-led intervention ($p>0.05$). Mode of delivery varied slightly across groups, with a higher proportion of cesarean deliveries in the "Not Helpful" group (67 cases) compared to the "Very Helpful" group (49 cases). Normal vaginal deliveries were relatively balanced across the groups (Table 4).

Table 4. Mode of delivery comparison

Mode of Delivery	Not Helpful	Somewhat Helpful	Very Helpful
Normal Vaginal	60	51	57
Assisted Vaginal	51	55	52
Cesarean	67	58	49

However, statistical significance was not observed in delivery mode distribution ($p=0.45$). A significant association was found between neonatal complications and the perception of midwifery-led intervention ($p=0.03$). The "Not Helpful" group had a higher occurrence of preterm birth (41 cases) and respiratory distress (48 cases), while the "Very Helpful" group exhibited comparatively lower frequencies of these complications (Table 5).

Table 5. Neonatal Complications Distribution

Neonatal Complication	Not Helpful	Somewhat Helpful	Very Helpful
None	45	35	41
Preterm Birth	41	29	36
Respiratory Distress	48	53	40
Jaundice	44	48	41

Postpartum complications, particularly postpartum haemorrhage, were more frequently reported in the "not helpful" group (45 cases) compared to the other groups. Fatigue was the most common complication across all groups, affecting 140 participants. Infections were reported in 115 cases, with no significant variation across perception groups (Table 6).

Table 6. Maternal Postpartum Complications

Complication	Not Helpful	Somewhat Helpful	Very Helpful
None	44	43	39
Fatigue	56	42	42
Infection	42	41	32
Postpartum Hemorrhage	36	38	46

A total of 203 newborns had APGAR scores <5, with the highest proportion in the "Not Helpful" group (74 cases).

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Scores of 5-7 and >7 were relatively similar across groups, indicating that the perception of midwifery-led care did not significantly impact overall new-born health status at birth (Table 7).

Table 7. APGAR score at Birth Distribution

APGAR Score	Not Helpful	Somewhat Helpful	Very Helpful
Score < 5	92	85	73
Score 5-7	50	44	49
Score > 7	57	51	53

Among the study participants, 252 individuals expressed the need for additional postpartum support, with nearly equal distribution across groups (p>0.05) (Table 8).

Table 8. Additional Support Needed

Additional Support	Not Helpful	Somewhat Helpful	Very Helpful
Yes	87	85	80
No	91	79	78

The distribution of maternal medical complications was examined, with anaemia (n=90), hypertension (n=84), and preeclampsia (n=78) being the most common. The presence of complications was not significantly different between groups (p=0.06). Thyroid disorders were observed in equal proportions across groups (Table 9).

Table 9. Medical Complications Distribution

Medical Complication	Not Helpful	Somewhat Helpful	Very Helpful
No Complications	23	16	16
Hypertension	16	16	12
Preeclampsia	16	21	15
Thyroid Disorders	24	24	24

Preterm births (<37 weeks) were recorded in 201 cases, with the "Not Helpful" and "Somewhat Helpful" groups having a higher proportion of preterm births (69 cases each) compared to the "Very Helpful" group (63 cases). The majority of deliveries occurred at term (37-39 weeks), with 279 cases in total (Table 10).

Table 10. Birth Weight Comparison Across Groups

Birth Weight (kg)	Not Helpful (Mean ± SD)	Somewhat Helpful (Mean ± SD)	Very Helpful (Mean ± SD)
Mean Birth Weight	2.8	2.8	2.8
Min Birth Weight	1.81	1.8	1.8
Max Birth Weight	3.99	4	3.9

Joint families were the most common household structure, followed by nuclear and extended families. No significant association was found between family structure and perception of midwifery-led care (Table 11).

Table 11. Gestational Age (Weeks) Distribution**.** A summary of gestational age across the three perception groups. Helps understand whether preterm births or full-term deliveries impact perception.

Gestational Age (weeks)	Not Helpful	Somewhat Helpful	Very Helpful
< 37 (Preterm)	69	69	63
37-39 (Term)	98	88	93
> 40 (Post-term)	11	7	2
Total	178	164	158

Regarding dietary habits, vegetarian, non-vegetarian, and mixed diets were evenly distributed across groups (Table 12).

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Table 12. Type of family distribution

Assesses whether joint/nuclear family systems influence perceived benefit.

Helps explore socio-cultural dynamics in healthcare perception.

Type of Family	Not Helpful	Somewhat Helpful	Very Helpful
Nuclear	60	47	54
Joint	65	88	56
Extended	55	46	50

Among the participants, 239 individuals recommended midwifery-led intervention, while 261 did not. A higher proportion of the "Not Helpful" group (90 cases) opposed the intervention compared to the "Very Helpful" group (71 cases) (Table 13).

Table 13. Dietary habits across groups

Understanding whether vegetarian/non-vegetarian diets impact perception. Could be linked to anaemia, nutritional deficiencies, and intervention effectiveness.

Dietary Habit	Not Helpful	Somewhat Helpful	Very Helpful
Vegetarian	57	59	55
Non-Vegetarian	58	53	58
Mixed Diet	63	59	45

Participants with lower income levels (<Rs.10,000/month) were more likely to be in the "Not Helpful" group (61 cases). The highest proportion of individuals in the "Very Helpful" category belonged to the Rs.10,000-20,000 income range (74 cases), but no significant correlation was found between income levels and perception ($p>0.05$) (Table 14)

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Table 14. Recommendation for Midwifery-Led Intervention Understanding if participants recommend midwifery-led care despite their perception. Can show the overall acceptability of the intervention.

Recommendation Given	Not Helpful	Somewhat Helpful	Very Helpful
Yes	88	80	71
No	90	84	87

5. Discussion

The findings of this study suggest that demographic and clinical factors do not significantly influence the perceived benefit of midwifery-led interventions. However, neonatal complications and maternal postpartum complications appear to play a pivotal role in shaping women's perceptions of midwifery-led care [4]. This highlights the importance of patient education, healthcare communication, and policy-driven interventions to improve awareness, trust, and confidence in midwifery-led models. Our results align with previous research that has explored the relationship between maternal healthcare perceptions and clinical outcomes, further underscoring the complex interplay between sociocultural, economic, and health-related factors in shaping maternal care choices.

Influence of demographic and socioeconomic factors on perception

In our study, age, BMI, family income, education level, and occupational status did not show a significant association with participants' perception of midwifery-led interventions (Table 1, Table 2, Table 3). These findings contrast with those reported by [22], who found that higher educational attainment and socioeconomic status positively influenced women's trust and preference for midwifery-led care. In contrast, our data indicate that women across all educational and income levels had similar perceptions, suggesting that awareness and trust in midwifery-led care may be independent of socioeconomic background in our study setting [23]. Another study by [24] reported that women from lower-income groups were more likely to view midwifery-led care as inferior to physician-led care, primarily due to limited access to quality midwifery services and a lack of

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exposure to positive birth experiences under midwifery-led care. While our study did not identify a direct association between income and perception, it is possible that healthcare accessibility, institutional trust, and prior healthcare experiences play a more significant role than income itself.

Mode of delivery and perception of midwifery-led interventions

A key finding of this study was that the mode of delivery did not significantly impact participants' perception of midwifery-led care (Table 4). Although some studies suggest that women who undergo normal vaginal delivery tend to have a more positive perception of midwifery-led care due to the emphasis on natural birthing processes, our results did not support this association [25] reported that midwifery-led models were associated with a lower likelihood of cesarean section and instrumental delivery, contributing to higher maternal satisfaction. However, our data show that women who underwent cesarean delivery, assisted vaginal delivery, or normal vaginal delivery had comparable views regarding the helpfulness of midwifery-led care. One possible explanation is that the perception of midwifery-led interventions may not be influenced solely by the mode of delivery but rather by the overall birth experience, including pain management, emotional support, and perceived safety. A study by [26] found that midwifery-led care resulted in higher satisfaction rates when women received continuous support and were actively involved in birth decisions, regardless of the mode of delivery. This suggests that interventions aimed at improving patient-centered care and communication may be more effective in shaping positive perceptions than focusing solely on delivery methods.

Neonatal complications and maternal perceptions

Our results indicate that neonatal complications significantly influenced participants' perception of midwifery-led care (Table 5). Women whose newborns experienced preterm birth, respiratory distress, or jaundice were more likely to rate midwifery-led interventions as less helpful. This aligns with the findings of [27], who reported that neonatal complications often lead to heightened maternal anxiety and a greater reliance on physician-led interventions. When adverse neonatal outcomes occur, women may perceive midwifery-led care as inadequate, even when clinical protocols have been appropriately followed. In contrast, women whose newborns had no complications were more likely to perceive midwifery-led interventions as beneficial. This suggests that positive neonatal outcomes reinforce trust in midwifery-led care, whereas complications may lead to skepticism, regardless of whether these complications were preventable. Similar findings have been reported in studies from high-income settings, where neonatal morbidity influences maternal decision-making in future pregnancies [28].

Maternal postpartum complications and perception

Postpartum complications, particularly postpartum hemorrhage and fatigue, were associated with a lower perceived benefit of midwifery-led interventions in this study (Table 6). Women who experienced postpartum hemorrhage were more likely to report midwifery-led care as less helpful, likely due to concerns over emergency preparedness and medical intervention availability. A study by [29] similarly found that postpartum hemorrhage was associated with lower confidence in midwifery-led care models, especially when rapid medical intervention was required. On the other hand, women who had uncomplicated postpartum recoveries tended to rate midwifery-led care more positively. This highlights the importance of providing clear communication and reassurance about midwifery-led emergency management strategies. [30] emphasized that structured postpartum follow-up and enhanced midwifery training in emergency response could help mitigate negative perceptions arising from postpartum complications.

The role of patient education and healthcare communication

Our findings reinforce the need for patient education and tailored healthcare communication to improve perceptions of midwifery-led care. Many of the negative perceptions associated with midwifery-led care appear to stem from a lack of awareness or misconceptions about its scope and capabilities. Studies have shown that providing women with accurate information about midwifery-led care, including its benefits, limitations, and emergency preparedness measures, significantly improves trust and acceptance [31].

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In many settings, women receive limited prenatal education regarding their birth options, which can lead to uncertainty and fear when complications arise. [31] suggested that structured prenatal education programs, combined with continuity of care, are essential for increasing maternal confidence in midwifery-led models. Future research should explore how different educational interventions, such as antenatal classes, digital health resources, and peer support groups, influence maternal perceptions of midwifery-led care.

Comparison with global findings and policy implications

While this study provides valuable insights into maternal perceptions of midwifery-led interventions, it is important to compare our findings with those from other healthcare systems. In high-income countries like the United Kingdom and the Netherlands, midwifery-led care is well-integrated into national healthcare systems, with strong institutional support and high maternal satisfaction rates [32]. In contrast, in many low- and middle-income countries, midwifery-led care remains underutilized due to regulatory barriers, limited resources, and societal preferences for physician-led care [33]. Our study's findings suggest that policies aimed at expanding access to midwifery-led care, improving emergency preparedness, and increasing public awareness could help bridge perception gaps. Evidence from [34] highlights that investing in midwifery workforce training, increasing midwife autonomy, and promoting collaborative care models can lead to improved maternal satisfaction and better clinical outcomes.

6. Conclusion

This study demonstrates that while demographic factors such as education and income do not significantly impact perceptions of midwifery-led care, maternal and neonatal complications play a crucial role in shaping women's views. Negative birth experiences, including neonatal morbidity and postpartum complications, are associated with lower confidence in midwifery-led interventions. Improving maternal perceptions requires targeted educational strategies, clear communication, and policy reforms that strengthen midwifery-led care integration within the broader healthcare system. Future research should further explore the impact of specific interventions, such as digital health education, midwife-patient communication strategies, and policy frameworks supporting midwifery-led care models.

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