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Preferences and Perspectives on Vaginal Breech Delivery in Ghana

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Keywords

Breech delivery; Ghana; Low- and middle-income countries; Obstetric training; Vaginal breech delivery

Synopsis

A survey of Obstetricians/Gynecologists and midwives in Ghana demonstrates that comfort performing vaginal breech deliveries is dependent on perceived adequacy of training.

Abstract

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Objective: To evaluate Obstetrician/Gynecologist and midwife perspectives and experiences with vaginal breech deliveries in Ghana.

Methods: Respondents completed a survey on their experiences, training, comfort levels, and decision-making about vaginal breech deliveries. Comparisons were made across Obstetricians/Gynecologists and midwives. Multiple logistic regression explored predictors of comfort performing vaginal breech deliveries.

Results: Respondents were 93 (36.5%) Obstetricians/Gynecologists and 162 (63.5%) midwives. Most believe some breech fetuses should be delivered vaginally, with higher agreement from Obstetricians/Gynecologists than midwives (97.7% vs 80.8%, $p=0.001$). Midwives were more likely to strongly agree that training was adequate for Obstetricians/Gynecologists (55.6% vs 9.8%, $p<0.001$) and midwives (49.6% vs 7.4%, $p<0.001$). Most (94%) respondents wanted more experience and/or training. Despite most providers performing only 1-5 breech vaginal deliveries yearly, 77.4% were comfortable performing and 79.5% were comfortable supervising them. Significant predictors of comfort performing vaginal breech delivery were perceived adequacy of training (OR 8.74) and belief that vaginal breech deliveries should be performed (OR 4.28).

Conclusion: Respondents were more likely to feel comfortable performing breech vaginal deliveries if they felt their training was adequate. Vaginal breech deliveries can only be offered as safe alternatives to cesarean delivery if training and experience is maintained in low-resource settings.

1 Introduction

Breech presentation complicates 3-4% of term deliveries [1]. After the Term Breech Trial demonstrated decreased neonatal morbidity and mortality with cesarean delivery compared with vaginal delivery for term breech fetuses [2], most high-income countries moved toward scheduled cesarean delivery for singleton breech presentations [3]. Currently, the incidence of vaginal breech delivery has decreased globally [4-6]. However, rates of cesarean delivery for malpresentation remain relatively low across low- and middle-income countries (LMICs), with only 27% of cases in Africa delivered via cesarean section [3].

Importantly, LMICs face unique challenges that may influence decision-making regarding whether to deliver breech fetuses vaginally or with cesarean section. Providers in LMICs may have more skills and experience with breech vaginal delivery than their high-resource counterparts, and rates of cesarean-associated

maternal morbidity may be higher in low-resource settings [7-9]. Access to safe surgical facilities, anesthesia, and perioperative care may be limited.

Maintaining skills and training for vaginal delivery for breech fetuses is an important consideration in LMICs. However, the preferences, perspectives, and experiences of providers in LMICs regarding breech vaginal delivery is unknown. Using a mixed-methods design, the current study fills this gap, evaluating Ghanaian Obstetrician/Gynecologists' (OBGYN) and midwives' beliefs regarding vaginal breech delivery practices in one such LMIC setting. Ghana has a cadre of trained midwives, who perform the majority of uncomplicated vaginal deliveries in Ghana, and OBGYNs, who often are involved in the decision-making and route of delivery of breech fetuses. Gaining perspectives from both types of providers provides a comprehensive view of provider experiences with breech deliveries in this setting. Results from the present study have the potential to inform training and practice protocols on vaginal breech delivery in LMICs.

2 Materials and methods

Respondents were OBGYNs and midwives whose primary site of clinical work was in Ghana. OBGYNs were residents, fellows, or consultants (i.e., attending physicians). Midwives were certified midwives. Survey respondents were recruited using WhatsApp groups for relevant professional organizations and hospitals in Ghana. WhatsApp (Facebook, Inc.) groups are electronic message boards, with OBGYN groups that include SOGOG (Society of Obstetricians and Gynaecologists of Ghana) and residency groups at all training sites (Korle Bu Teaching Hospital, Komfo Anokye Teaching Hospital, Cape Coast Teaching Hospital, and Ridge Hospital). Midwives were contacted using groups for Korle Bu Teaching Hospital and Komfo Anokye Teaching Hospital. Respondents were offered the opportunity to be entered into a raffle for a tablet device as an incentive for participation. Institutional review board approval was granted by the Komfo Anokye Teaching Hospital (KATH-IRB/PA/012/20) and the University of Michigan (HUM00174974). Respondents provided consent electronically, prior to completing the survey.

A survey was generated using REDCap (Version 9.1.0, Vanderbilt University 2019) and electronically distributed between April 17th and May 1st, 2020. Questions were asked in English, the official language of medical education in Ghana.

Respondents indicated their age, gender, number of years of practice, clinical role (OBGYN vs midwife), and characteristics of the hospital in which they practice (geographic region, urban vs rural location, type of hospital).

Respondents reported how many total vaginal deliveries and breech vaginal deliveries they performed per year, using multiple choice questions. Categorical responses were combined such that respondents fell into one of two groups: ≤ 50 or > 50 total vaginal deliveries, and ≤ 10 or > 10 breech vaginal deliveries.

Respondents were asked if some breech fetuses should be delivered vaginally (yes, no, I don't know). In addition, they were prompted to complete a free response short answer explaining why they selected their response. They then responded to six statements about their comfort performing a vaginal breech delivery, comfort supervising a vaginal breech delivery, adequacy of their personal training on vaginal breech deliveries, perceived adequacy of training of OBGYNs on vaginal breech delivery, perceived adequacy of training of midwives on vaginal breech delivery, and whether they desire additional experience and/or training on vaginal breech delivery. Responses were on a four-point Likert scale, ranging from "strongly disagree" to "strongly agree."

Respondents rated the importance of nine clinical factors in their decision to deliver a breech fetus vaginally, including parity, fetal size, prior uterine incisions, type of breech, single vs multiple gestation, gestational age, fetal anomalies, maternal health conditions, and patient preference. Responses were on a four-point Likert scale ranging from "not important at all" to "very important."

Age and number of years of practice were collected and analyzed as continuous variables. Gender, geographic region, urban vs rural location, type of hospital, and clinical role were asked as multiple choice questions and analyzed as categorical variables. Answer choices for statements on comfort and training were presented as a four-point Likert scale. For logistic regression analysis, responses were collapsed into two response categories: agree vs disagree.

STATA (Version 16.0, StataCorp. 2019) was used for analysis. Our primary outcome was defined as respondents' reported comfort performing a vaginal breech delivery (agree, yes/no). Demographics, clinical experience, and attitude variables were calculated for the total population using means and proportions. Chi-squared and Student's *t*-test were conducted to compare OBGYNs and midwives. Bivariate logistic regression models evaluated predictors of respondents' comfort performing

vaginal breech delivery (agree, disagree). Factors that were significantly associated with the outcome in bivariate analysis were then included in a final adjusted logistic regression model, along with factors the study team deemed important to control for. The final model was adjusted for age, gender, type of healthcare facility, and number of total annual vaginal deliveries. Simple and adjusted odds ratios with 95% confidence intervals (CI) were calculated. All *p*-values were two-sided and a *p*-value <0.05 was considered statistically significant. Responses from short answer questions were analyzed qualitatively. Using an incremental and iterative process, keyword phrases were identified and a codebook was created. Once the list of generated codes achieved stability, the coding process was repeated for all responses. Each response could be assigned multiple codes.

3 Results

The survey was distributed to 814 potential respondents (384 OBGYNs and 430 midwives) and 350 surveys were returned, for a response rate of 43%. Surveys were excluded if greater than 50% of responses were missing. Ninety-one surveys were excluded for missingness, leaving a total of 259 surveys for analysis. Of respondents who answered the question regarding their role, 93 (36.5%) respondents were OBGYNs and 162 (63.5%) were midwives. The majority of respondents are employed at district or teaching hospitals and work in urban areas. All 16 regions in Ghana were represented, with half of respondents from the Greater Accra or Ashanti regions, where Ghana's capital city and second largest city are located. See Table 1 for additional demographic characteristics of the sample.

First, comparisons were made between OBGYN and midwife demographics, experience, training, and clinical decision-making on vaginal breech deliveries. Midwives were younger, more likely to be female, and more often worked in rural locations than OBGYNs. In addition, midwives reported fewer years in practice since completing their education relative to OBGYNs. Most OBGYNs and midwives perform ≥ 76 vaginal deliveries and 1-5 breech vaginal deliveries each year (Figure 1). The majority of respondents believe some breech fetuses should be delivered vaginally, with a higher rate of agreement from OBGYNs than from midwives (97.7% vs 80.8%, $p=0.001$) (Table 2). Most OBGYNs and midwives feel comfortable performing a vaginal breech delivery ($n=199$, 77.4%) and supervising or teaching a vaginal breech delivery ($n=202$, 79.5%). Compared to OBGYNs, midwives were

more likely to strongly agree that training on vaginal breech delivery was adequate for OBGYNs (55.6% vs 9.8%, $p < 0.001$) and midwives (49.6% vs 7.4%, $p < 0.001$). Ninety-four percent agreed with the statement “I want more experience/training on vaginal breech delivery.” The majority of respondents felt that all provided clinical factors were very important in making their decision on mode of delivery for a breech fetus (Figure 2).

Next, factors associated with respondents' comfort performing vaginal breech deliveries were evaluated. Age, gender, years in clinical practice, clinical role, type of hospital, number of annual total vaginal deliveries and breech vaginal deliveries, perceived adequacy of training, and belief that vaginal breech deliveries should be performed emerged as being significantly associated and were subsequently included in a final adjusted logistic regression model. Region of practice and urban vs rural location were not significant in the bivariate model. Of note, clinical role (OBGYN vs midwife) was not significantly associated with comfort performing vaginal breech deliveries in the final model; thus, providers were collapsed in a single model. After adjusting for age, gender, type of hospital, and number of annual vaginal deliveries performed, perceived adequacy of training (OR 8.74, 95% CI 3.39-22.52, $p < 0.001$) and the belief that vaginal breech deliveries should be performed (OR 4.28, 95% CI 1.33-13.72, $p = 0.02$) remained significantly associated with respondents' comfort performing vaginal breech delivery (Table 3).

Finally, providers gave descriptions of their clinical decision-making, which were analyzed qualitatively (Table 4). Of respondents who believed that some breech fetuses should be delivered vaginally, the three most common responses were the avoidance of a cesarean delivery and its associated morbidity in current and future pregnancies, the belief that vaginal breech deliveries are safe if performed by a skilled provider, and the belief that vaginal breech deliveries are safe if clinical criteria are met. For their counterparts who believed that no breech fetuses should be delivered vaginally, the three most common responses were poor neonatal outcomes and need for resuscitation, lack of provider skill, and maternal lacerations.

4 Discussion

The present study provides novel data on the perspectives of obstetric providers in Ghana regarding vaginal breech deliveries. The vast majority of respondents believed some breech fetuses should be delivered vaginally. Despite most

respondents performing only 1-5 breech vaginal deliveries each year, comfort levels were overall high, with 77% agreeing they feel comfortable performing a vaginal breech delivery and 80% agreeing they feel comfortable supervising or teaching a vaginal breech delivery. Respondents were nine times more likely to report feeling comfortable performing breech vaginal deliveries if they felt that their training was adequate.

Regarding training on vaginal breech delivery, 81% agreed they personally got adequate training. Interestingly, when asked about training in general, only 59% agreed that OBGYN residents get adequate training and 64% agreed that midwives get adequate training. Compared to midwives, fewer OBGYNs agreed that training is adequate. Importantly, the vast majority (94%) reported wanting more experience and/or training on vaginal breech delivery.

This study highlights the complexity of decision-making surrounding vaginal breech deliveries in LMICs. Of the nine clinical factors provided, the majority of respondents felt that each of them was “very important” in their decision on mode of delivery for a breech fetus. When prompted to provide additional clinical factors they consider, the list was long and varied, and included clinical, provider, facility, and systems considerations. Importantly, patient preference was only cited by 2.5% of participants. This highlights the importance of incorporating patient counseling and informed patient consent into training protocols on vaginal breech deliveries [10].

Availability of equipment and personnel for rapid operative deliveries and neonatal care were cited as important in promoting safe management of labor and attempted vaginal deliveries for breech fetuses. However, access to these services can be challenging in LMICs. In some situations, the inability to provide a safe cesarean delivery necessitates a vaginal breech delivery. This underscores the importance of quality training for obstetric providers, particularly those who will practice in lower-resource, rural areas.

Limitations of this study include the response rate, which could contribute to response bias. Healthcare providers other than OBGYNs and midwives were not included in this survey. Although the majority of deliveries in Ghana are performed or supervised by an OBGYN or midwife, future research may consider perspectives of other provider types. Although the method of survey distribution reached the vast majority of all OBGYNs practicing throughout the country, midwives were limited to those practicing at or affiliated with the two largest teaching hospitals in Ghana—

potentially causing us to miss a unique perspective of midwives in northern Ghana. Despite these limitations, diversity of respondents was reflected in responses from all sixteen regions of Ghana, both rural and urban areas, and levels of facility ranging from tertiary teaching hospitals to maternity homes. The average length of time in practice was 8.3 years; thus, a recall bias may exist regarding training questions, as providers are recalling training that occurred many years ago. However, as the breadth of respondent experience was important for exploring the presented research questions, we did not limit the survey to individuals who had recently completed their training. Additionally, providers who are more comfortable with their current skill delivering breech fetuses may recall their training more favorably. This study was conducted in a single country, which may limit generalizability to other LMICs. However, Ghana is an ideal location for this study given its strong in-country postgraduate training of OBGYNs [11-13], which results in capacity for both cesarean delivery and skilled vaginal breech delivery.

Consistent with the literature [3], our study demonstrated that the vast majority of obstetric providers in LMICs perform vaginal breech deliveries. Many respondents felt that vaginal breech delivery is an important method for decreasing maternal morbidity associated with cesarean delivery. The literature on this is mixed, with the PREMODA study demonstrating no significant difference in neonatal outcomes when an appropriate candidate underwent a vaginal breech delivery vs a cesarean delivery [14], but the Term Breech Trial demonstrating decreased neonatal morbidity and mortality with cesarean delivery compared with vaginal delivery for term breech fetuses [2]. Consistent with the views of participants in our study, subsequent commentary on the Term Breech Trial raises concerns over the morbidity of cesarean section for breech fetuses, in current and subsequent pregnancies [15]. Respondents felt that multiple clinical factors were important in determining the mode of delivery for breech fetuses. In Ghana, many providers use the Zatuchni-Andros criteria, which takes into account gestational age, parity, estimated weight, prior breech delivery, dilation, and station to determine if a patient is an appropriate candidate for a vaginal breech delivery [16].

The skillset required for vaginal breech delivery continues to be relied upon in LMICs. As demonstrated by this study, comfort level performing vaginal breech delivery is dependent on perceived adequacy of training. Although comfort levels were high overall, the majority of respondents perform only 1-5 vaginal breech

deliveries each year. Building capacity for adequate training on vaginal breech deliveries is important. Although there is limited data on simulation training in LMICs, low-cost simulation on vaginal breech deliveries may help maintain the appropriate skills to offer safe vaginal breech deliveries [17-19]. Of note, there are no national guidelines in Ghana on management of breech vaginal deliveries and training protocols for OBGYNs and midwives. In addition, little is known about protocols and provider comfort with performing external cephalic versions in LMIC. This study highlights the importance of developing these protocols and guidelines in LMIC settings.

This study lays the groundwork to explore issues of training, experience, and competency in vaginal breech deliveries in LMIC settings. As cesarean delivery rates increase in LMICs, thoughtful protocols are important to avoid perioperative morbidity in current pregnancies and complications of invasive placentation in subsequent pregnancies. However, vaginal deliveries for breech fetuses can only be offered as safe alternatives to cesarean delivery if training and experience is maintained in low-resource settings. Importantly, self-reported comfort level performing vaginal breech deliveries, and its association with adequacy of training, does not equate to objective skill level. Additional research is needed to explore the relationship between provider training, facility-level factors, and neonatal or maternal outcomes for breech vaginal deliveries in LMIC settings.

Author contributions

Conception of research was by ERL and AAK. Planning and carrying out the research was completed by ERL, SGB, TOK, AT, and AAK. Analysis was done by ERL and SC. Writing of the manuscript was done by ERL, SGB, TOK, AT, SC, and AAK.

Conflicts of interest

The authors report no conflicts of interest.

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FIGURE LEGENDS

Figure 1. Average annual total of vaginal deliveries and breech vaginal deliveries

Figure 2. Importance of clinical factors in making the decision on mode of delivery for a breech fetus

TABLE 1 Demographic, hospital, and clinical practice characteristics

Characteristic	All respondents (N=259 ^a)	OBGYNs (n=93 ^a)	Midwives (n=162 ^a)	p-value ^b
Age, years	34.8 ± 7.4	38.9 ± 7.7	32.4 ± 6.1	< 0.0001 ^b

Gender				< 0.001 ^b
Male	84 (32.7)	78 (83.9)	6 (3.7)	
Female	173 (67.3)	15 (16.1)	156 (96.3)	
Type of hospital				< 0.001 ^b
District hospital	107 (41.8)	29 (31.2)	78 (48.5)	
Regional hospital	24 (9.4)	7 (7.5)	16 (10.0)	
Teaching hospital	85 (33.2)	54 (58.1)	30 (18.6)	
Private hospital	18 (7.0)	3 (3.2)	15 (9.3)	
Health centre/Maternity home/CHPS ^c	18 (7.0)	0 (0.0)	18 (11.2)	
Other	4 (1.6)	0 (0.0)	4 (2.5)	
Type of hospital location				0.005 ^b
Urban	186 (73.2)	79 (85.0)	105 (66.0)	
Rural	55 (21.7)	11 (11.8)	44 (27.7)	
Not sure	13 (5.1)	3 (3.2)	10 (6.3)	
Years in Practice ^d	8.3 ± 6.2	12.3 ± 7.3	5.9 ± 3.9	<0.0001 ^b

Data presented as n (%) or mean ± SD

^aOf total respondents, 4 did not answer the question regarding their role, so OBGYNs and Midwives do not total 259

^bSignificance at $p < 0.05$, comparison between OBGYNs and Midwives, using chi-squared and *t*-tests

^cGhana Health Service Community-Based Health Planning and Service

^dYears since completing medical or midwifery school

Table 2 Experiences, attitudes, and training

Characteristic	All respondents (N=259 ^a)	OBGYNs (n=93 ^a)	Midwives (n=162 ^a)	<i>p</i> -value ^b
I feel comfortable performing a vaginal breech delivery				0.001 ^b

Strongly agree	86 (33.5)	45 (48.4)	1 (25.6)	
Somewhat agree	113 (44.0)	37 (39.8)	73 (45.6)	
Somewhat disagree	39 (15.2)	8 (8.6)	31 (19.4)	
Strongly disagree	19 (7.4)	3 (3.2)	15 (9.4)	
I feel comfortable supervising/teaching vaginal breech delivery				0.2
Strongly agree	98 (38.6)	43 (46.2)	55 (35.0)	
Somewhat agree	104 (41.0)	37 (39.8)	64 (40.8)	
Somewhat disagree	34 (13.4)	9 (9.7)	25 (15.9)	
Strongly disagree	18 (7.1)	4 (4.3)	13 (8.3)	
I got adequate training performing a vaginal breech delivery				0.5
Strongly agree	110 (43.0)	36 (38.7)	74 (46.5)	
Somewhat agree	97 (37.9)	40 (43.0)	54 (34.0)	
Somewhat disagree	33 (12.9)	11 (11.8)	22 (13.8)	
Strongly disagree	16 (6.3)	6 (6.5)	9 (5.7)	
I think OBGYN residents receive adequate training on vaginal breech delivery				<0.001 ^b
Strongly agree	73 (36.1)	8 (9.8)	65 (55.6)	
Somewhat agree	63 (31.2)	28 (34.2)	35 (29.9)	
Somewhat disagree	48 (23.8)	37 (45.1)	9 (7.7)	
Strongly disagree	18 (8.9)	9 (11.0)	8 (6.8)	
I think midwives receive adequate training on vaginal breech delivery				<0.001 ^b
Strongly agree	66 (32.2)	6 (7.4)	60 (49.6)	
Somewhat agree	65 (31.7)	29 (35.8)	35 (28.9)	
Somewhat disagree	56 (27.3)	37 (45.7)	18 (14.9)	
Strongly disagree	18 (8.8)	9 (11.1)	8 (6.6)	
I want more experience/training on vaginal breech delivery				<0.001 ^b
Strongly agree	159 (77.6)	51 (62.2)	105 (87.5)	

Somewhat agree	33 (16.1)	20 (24.4)	13 (10.8)	
Somewhat disagree	5 (2.4)	4 (4.9)	1 (0.9)	
Strongly disagree	8 (3.9)	7 (8.6)	1 (0.9)	

Data presented as n (%)

^an=232 combined OBGYNs/Midwives due to missingness of responses on individual questions

^bSignificance at $p < 0.05$, comparison between OBGYNs and Midwives, using chi-squared

TABLE 3 Predictors of comfort performing vaginal breech deliveries (adjusted logistic regression model)

Characteristic	Bivariate analysis		Multivariate analysis	
	Unadjusted OR	<i>p</i> -value	Adjusted OR (95% CI)	<i>p</i> -value
Age of healthcare provider	1.05	0.02 ^a	0.92 (0.82-1.04)	0.19
Gender of healthcare provider				
Female	0.33	0.005 ^a	0.51 (0.11-2.34)	0.39
Years in clinical practice	1.14	0.001 ^a	1.18 (0.99-1.40)	0.07
Clinical role				
OBGYN	REF	REF	REF	REF
Midwife	0.33	0.003 ^a	0.61 (0.13-2.90)	0.54
Type of hospital				
District hospital	1.45	0.23	0.86 (0.22-3.41)	0.83
Regional hospital	0.34	0.10	0.20 (0.02-1.82)	0.15
Teaching hospital	1.43	0.28	0.37 (0.08-1.83)	0.22
Private hospital ^b	0.43	0.10	–	–
Health centre/Maternity home/CHPS ^c	0.34	0.03 ^a	0.49 (0.76-3.14)	0.45

Number of annual <i>total</i> vaginal deliveries				
>50	1.95	0.03 ^a	0.85 (0.33-2.19)	0.74
Number of annual <i>breech</i> vaginal deliveries				
>10	3.51	0.001 ^a	1.25 (0.44-3.55)	0.42
Training perceived as adequate				
Agree	9.27	<0.001 ^a	8.74 (3.39-22.52)	<0.001 ^d
Belief that vaginal breech deliveries should be performed				
Yes	10.75	<0.001 ^a	4.28 (1.33-13.72)	0.02 ^d

^aSignificant at $p < 0.05$ in bivariate model

^bPrivate hospital category not included in multivariate model due to missingness

^cGhana Health Service Community-Based Health Planning and Service

^dSignificant at $p < 0.05$ in bivariate model

TABLE 4 Answers^a and comments^b to “Should some breech fetuses be delivered vaginally?”

Answers and Comments	n (%) ^c
Yes	207 (87.0)
<i>Please explain why you think some breech fetuses should be delivered vaginally (n=197^d)</i>	
Safe if clinical criteria are met	167 (84.8)
Avoid cesarean delivery and its morbidity in current and future pregnancies	24 (12.2)
Safe if performed by a skilled provider	24 (12.2)
Safe if resources are available for surgical intervention and neonatal care	12 (6.1)
Patient presents in advanced stage of labor	11 (5.6)

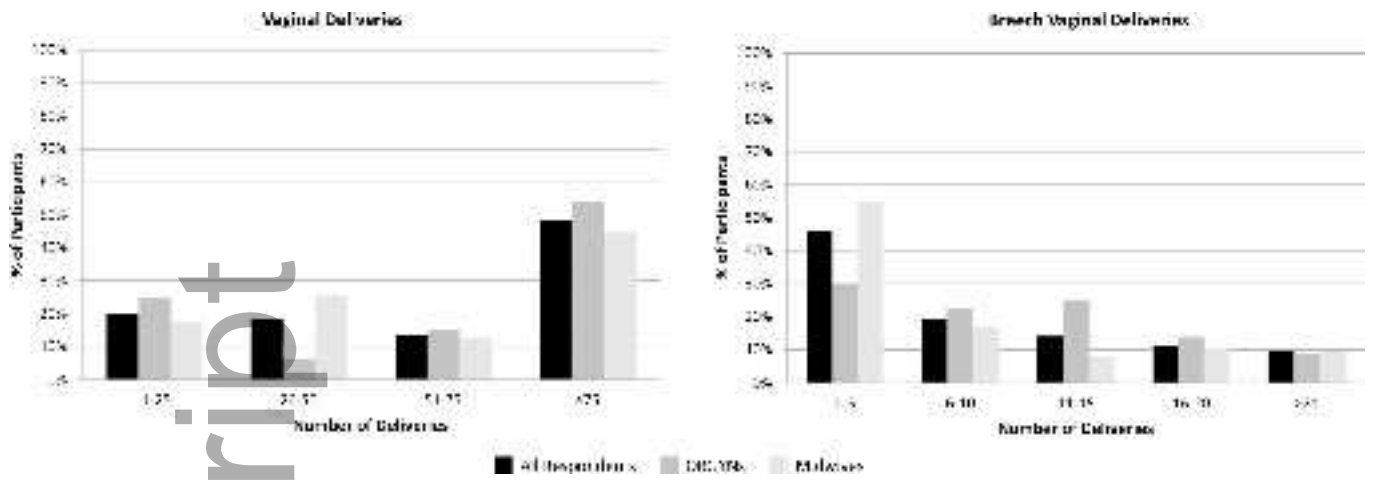
Patient preference	5 (2.5)
Maintain skill set of providers	2 (1.2)
No	25 (10.5)
<i>Please explain why you do not think any breech fetuses should be delivered vaginally (n=22^d)</i>	
Poor neonatal outcomes/need for neonatal resuscitation	15 (68.2)
Lack of attendant skill	6 (27.2)
Maternal complications (e.g., cervical laceration)	3 (13.6)

^aN=232 due to missingness of responses on individual questions

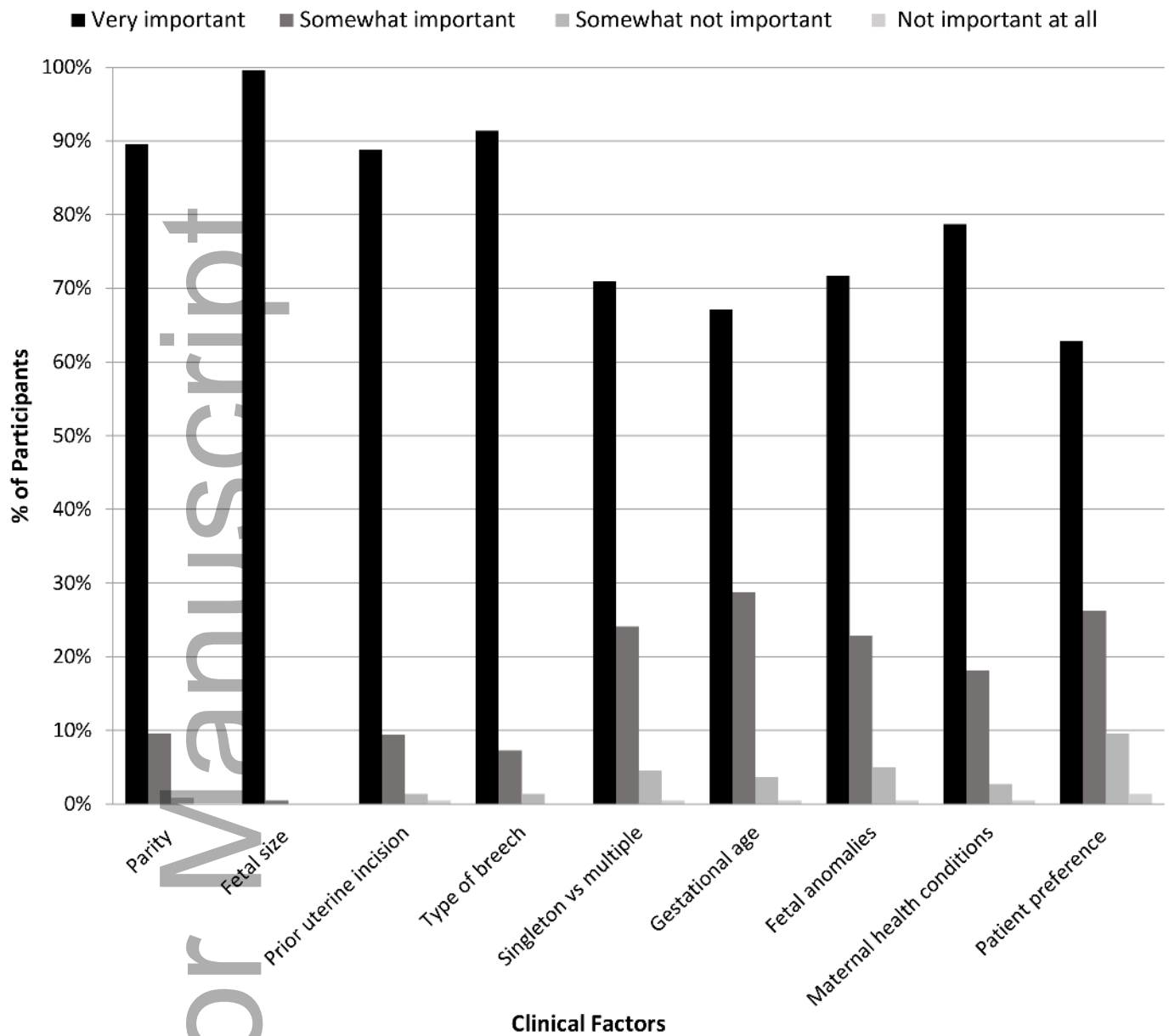
^bComments included if reported by at least 2 respondents

^cPercentages do not equal 100%; some comments were coded with multiple responses

^dNumber of respondents who provided comments



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