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Effect of Community-Based Intervention (Pregnant Women's Conference) on Institutional Delivery in Ethiopia

Melash Belachew Asresie and Gizachew Worku Dagne

Abstract

Institutional delivery is the foundation for diminishing maternal mortality. Evidence showed that community-based behavioral change interventions are increasing institutional delivery in developing countries. By understanding this, the government of Ethiopia launched a community-based intervention called “pregnant women's conferences” to improve institutional delivery. This study was conducted to assess its effectiveness on institutional delivery among 871 women who gave birth within the last 12 months (435: pregnant women's conference attendants and 436: pregnant women's conference non-attendants) in 2017. It was a community-based comparative cross-sectional study and participants were selected using a multi-stage-simple random sampling technique. A structured interviewer-administered questionnaire was used for data collection. The result showed that institutional delivery among women who attended pregnant women's conferences was 54.3% (95%CI: 49.9–59.1), higher compared with 39.9% (95%CI: 35.3%– 44.7%) of women who did not attend the conference. Likewise, the level of well-preparedness for birth was higher among women who attended the conference ($P = 38.9\%$, 95%CI: 33.8–43.7), compared with their counterparts ($P = 25.7\%$, 95% CI: 22.2–29.4). Similarly, women's knowledge of obstetric danger signs was higher among women who attended the conference. Therefore, encouraging pregnant women to attend the conference should be strengthened.

Keywords: Pregnant women's conference, effect, pregnant, institutional delivery, Northwest, Ethiopia

1. Introduction

Birth assisted with skilled personnel is the foundation for reducing maternal Mortality. However, it is low in low and middle-income countries [1, 2]. Behavioral changing community-based interventions are globally recommended to increase institutional delivery by increasing obstetric danger signs and birth preparedness knowledge among women and the community [3, 4]. Low and middle-income countries have recently worked on behavior change interventions and mobilization of the community to increase institutional delivery and other maternal service utilization [5–7].

To improve institutional delivery the public authority of Ethiopia has strived by introducing innovative practices like community participation such as the establishment of health development army at the village level, the adaptation of cultural practices at the health facility level such as preparation of “maternal waiting home”, making the service free of charge and provision of charge-free transport service for pregnant women during labor and delivery. In this manner, acquires incredible changes in the use of maternal and childcare [8–11], however, still lagging behind the target. To overcome this challenge, the Ethiopian minister of health also launched recently a community-based intervention called “pregnant women’s conference” (PWC) to enhance obstetric danger sign awareness and institutional skilled maternal health service utilization. The goal of PWC is to increase skilled maternal health care service, by reducing two delays (delay in deciding to seek care and delay to reach a health facility) through enhancing obstetric danger signs knowledge that may occur during pregnancy, childbirth, and postpartum period and inspire the women to prepare to childbirth and against the occurrence of any obstetric complication ahead of time.

The assigned Nurse/Midwifery provides education about Obstetric danger signs, antenatal care, institutional delivery, postnatal care, child care, child feeding, and immunizations. Each woman is expected to attend at least three conferences during each pregnancy. The service is delivering at their kebele level/the smallest administrative in Ethiopia/monthly and coordinated by community health workers called health Extension workers. As far as the authors are aware no study evaluated PWC intervention effectiveness on institutional delivery. Hence, this study was tried to evaluate the effect of PWC on institutional delivery by compared the prevalence of institutional delivery among women who attended PWC and women who did not attend the PWC during their last pregnancy in rural Northwest, Ethiopia.

2. Main body

2.1 Material and methods

2.1.1 Study area and period

The study was conducted in rural Libo Kemkem District Northwest Ethiopia from February 15 to March 26, 2017. It is 645 km away from Addis Ababa’s capital city of Ethiopia. The district has 29 rural Kebeles & 5 urban Kebeles [12].

2.1.2 Study design, study population, and sample size

A comparative community-based cross-sectional study was carried out in women who gave birth within the last 12 months before the survey. For each group, the sample size was calculated using the two-sample comparisons of proportion formula using Epi-Info V.7, by considering the following assumptions: confidence level 95%, power 80, and the prevalence of institutional delivery in the intervention and the controlled group was 56% and 36%, respectively from the Burkina Faso study, as there is no similar study done in the study area [11]. Adding of 5% non-response rate and multiplied by 2 since we used the multistage sampling technique, the final minimum sample size calculated for each group was 450.

2.1.3 Sampling technique, data collection tool, process, and analysis

We used a multistage sampling technique to select 450 women for each group and each selected kebele. The first Seven rural kebele were selected using the lottery

method of simple random sampling technique. Then women who gave birth in the last year prior to the survey at each selected kebele were grouped into two: pregnant women conference “attendants” and “non-attendants” using their family matrix book found from health post. After proportional allocation was done for each kebele computer generating simple random sampling technique was used to select study participants. A structured and pre-tested interviewer-administered questionnaire was used for data collection. The data was collected by trained data collectors using the local language Amharic. The tool was first developed in the English language then translated to the Amharic language. The collected data were coded and entered into EPI-Info version 7 and export to SPSS version 23 for analysis. Both descriptive and regression analyses were performed using binary logistic regression model. In the bivariate analysis variables with a P-value ≤ 0.20 were kept in the multivariable analysis to control the effect of confounders. Before doing independent logistic regression analysis for PWC attendants and non-attendants, a significant difference between the two groups was confirmed. Chi-square testing was done to see if there was a difference in institutional delivery utilization between the two groups (PWC attendants VS non-attendants) and a statistically significant difference was observed between the two groups ($\chi^2 = 17.98$, $df = 1$, $p = <0.001$), suggesting separate analysis. Odds ratios (AOR) with their 95% CI was calculated to measure the strength of association, and P-value ≤ 0.05 was considered as statistically significant.

2.2 Results

2.2.1 Socio-demographic and other characteristics of the respondents

About 96.7% of questionnaires distributed for PWC attendants and 96.9% of questionnaires distributed for PWC non-attendants were filled and analyzed. The mean age of women who attended the conference and did not attend the conference was 30.9 ± 5.5 years and 31.6 ± 5.1 years, respectively. Three-fourth (75.8%) of women who attended PWC and 60.9% of women who did not attend the PWC their age was 25–34 years. Above half (56.8%) and 45% of women who attended PWC and did not attend PWC were living within 1 hr. of walking from the nearest health facility. The majority of women, 92.2% of women who attended the PWC and 78.0% of women who did not attend the PWC were had at least one ANC visit during their last pregnancy. Three-fourth (72.6%) of women who attended the PWC and 55% of women who did not attend the PWC had discussed the place of delivery. Half of the women who attended the PWC and 56.4% of women who did not attend the PWC gave birth at a health institution before the index birth. About 1.4% of women who attended PWC and 3.4% of women who did not attend the PWC had experienced stillbirth (**Table 1**).

2.2.2 Awareness of obstetric danger signs

Each woman was asked to mention the key danger signs that can happen during pregnancy, childbirth, and the postpartum period. Accordingly, about 99.8% and 95.4% of women who attended and did not attend the PWC were committed to mention at least one obstetric key danger sign that may occur during pregnancy, childbirth, or postpartum periods. About 62% and 40% of women who attended and did not attend the PWC were mentioned severe vaginal bleeding as a dangerous sign during pregnancy, respectively (**Table 2**).

2.2.3 Obstetric danger signs knowledge

In this study, a mother was considered as *knowledgeable on pregnancy danger signs* if she mentioned at least two of the three key danger signs (severe vaginal bleeding,

Variable	Variable Categories	PWC non-attendants (n = 436)	PWC attendants (n = 435)
		n (%)	n (%)
Age of women (years)	19–24	62(14.2)	41(9.4)
	25–34	252(75.8)	265(60.9)
	> = 35	122(28)	129(29.7)
Educational status	Unable to read and write	379(86.9)	401(92.2)
	Can read and write	0(0.0)	2(0.5)
	Grade 1–8	51(11.7)	32(7.4)
	Secondary and above	6(1.4)	0(0.0)
Occupation	Housewife	417(95.6)	430(98.9)
	Farmer	11(2.5)	5(1.1)
	Governmental employee	8(1.8)	0(0.0)
Marital status	Divorce	9(2.1)	5(1.1)
	Widowed	2(0.5)	1(0.2)
	Married	425(97.5)	429(98.6)
Family size	≤4	113(25.9)	125(28.7)
	> = 5	323(74.1)	310(71.3)
Husbands' education	Unable to read and write	271(67.8)	263(61.3)
	Can read and write	102(24.0)	118(27.5)
	Grade 1–8	35(8.24)	40(9.3)
	Secondary and above	17(4)	8(1.9)
Husbands' Occupation	Farmer	407(95.8)	419(95.6)
	Governmental employee	18(4.24)	10(2.3)

Table 1.
Socio-demographic characteristics of women who gave birth in the last 12 months, in the context of attending PWC, Northwest Ethiopia, 2017.

Variables	Categories	PWC non-attendants' n (%)	PWC attendants' n (%)
Danger signs			
During pregnancy	Severe vaginal bleeding	176 (40.4)	269 (61.8)
	Swollen of hands and face	151 (34.6)	214 (49.2)
	Blurred vision	92 (21.1)	110 (25.3)
During childbirth	Sever vaginal bleeding	118 (27.1)	182 (41.8)
	Prolonged labor (>12 hrs)	129 (29.6)	174 (40)
	Convulsion	35 (8.0)	68 (15.6)
	Retained placenta	287 (67.4)	309 (71.2)
During postpartum	Severe Vaginal bleeding	182 (42.7)	267 (61.5)
	Foul-smelling vaginal discharge	79 (18.5)	166 (38.2)
	High fever	11 (2.6)	53 (12.2)

Table 2.
Awareness of obstetric danger signs among women who gave birth in the last 12 months, in the context of attending PWC, Northwest Ethiopia, 2017.

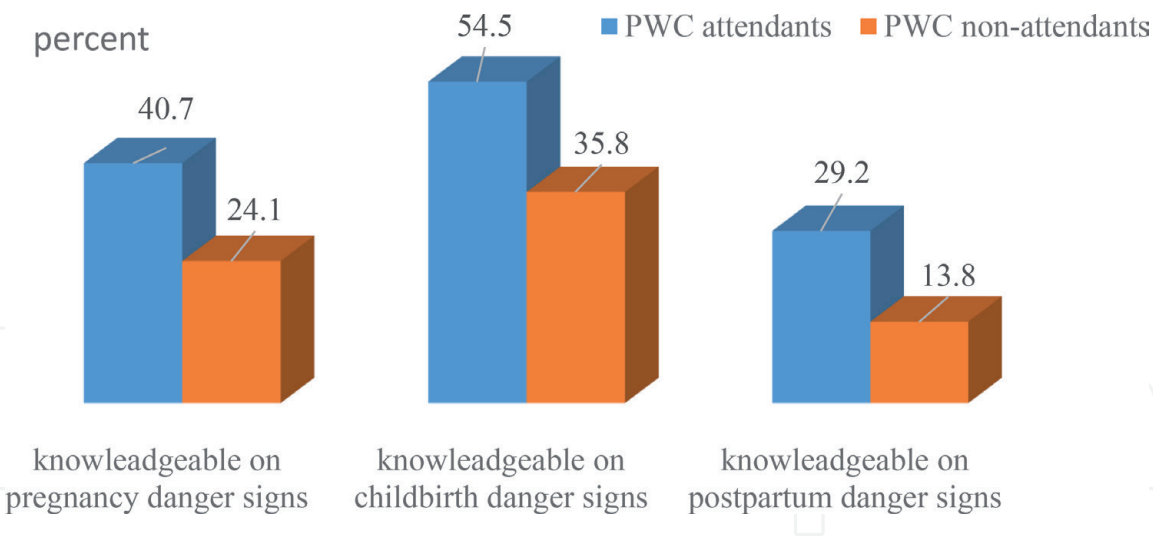


Figure 1.
Knowledge of obstetric danger signs among women who gave birth in the last 12 months, in the context of attending PWC, Northwest Ethiopia, 2017.

swollen hands/face, and blurred vision) that may occur during pregnancy, *knowledgeable on childbirth danger signs* if she mentioned at least two of the four key danger signs (severe vaginal bleeding, prolonged labor (>12 hours), convulsion, and placenta retained) may happen during labor, and *knowledgeable on postpartum danger signs* if she mentioned at least two of the three key danger signs (severe vaginal bleeding, foul-smelling vaginal discharge, and high fever) may happen during the postpartum period. According to this definition, about 41% and 24% of women who attended and did not attend PWC were knowledgeable (mentioned at least two danger signs) on pregnancy danger signs, respectively (**Figure 1**).

2.2.4 Birth and its complication readiness practice during their last pregnancy

All women were asked what they prepared before the onset of labor during their last pregnancy. Almost three-fourth (73.3%) of women who attended the PWC and half (54.4%) of women who did not attend the PWC, reported that they were planned health facilities for delivery. About 42% of PWC attendants and 29% of PWC non-attendants were saved money for an emergency before the onset of labor (**Figure 2**).

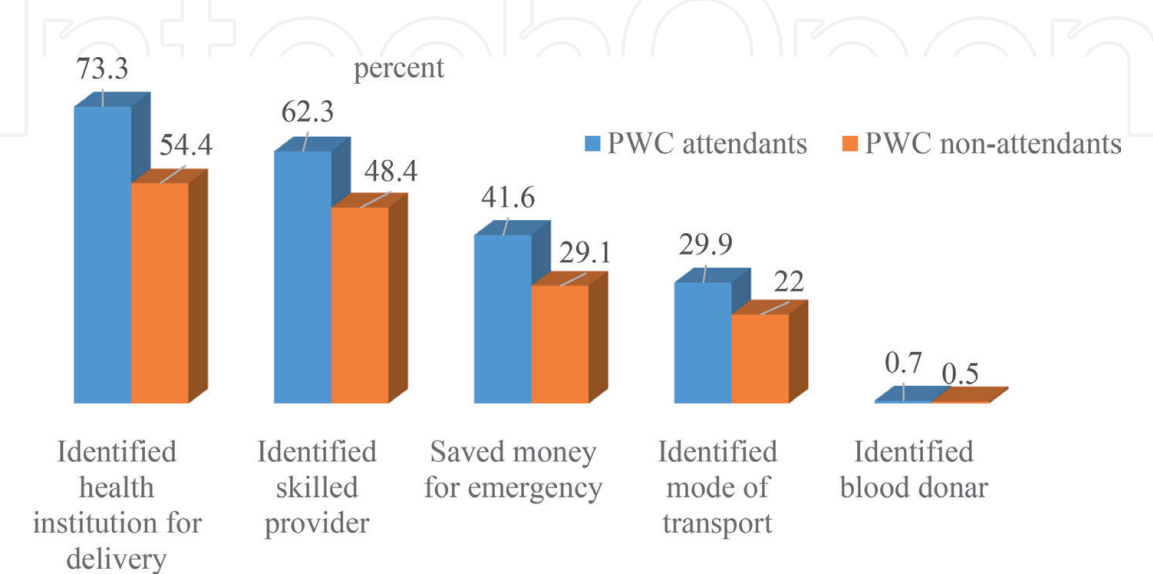


Figure 2.
Birth preparedness and complication readiness practice among women who gave birth in the last 12 months, in the context of attending PWC, Northwest Ethiopia, 2017.

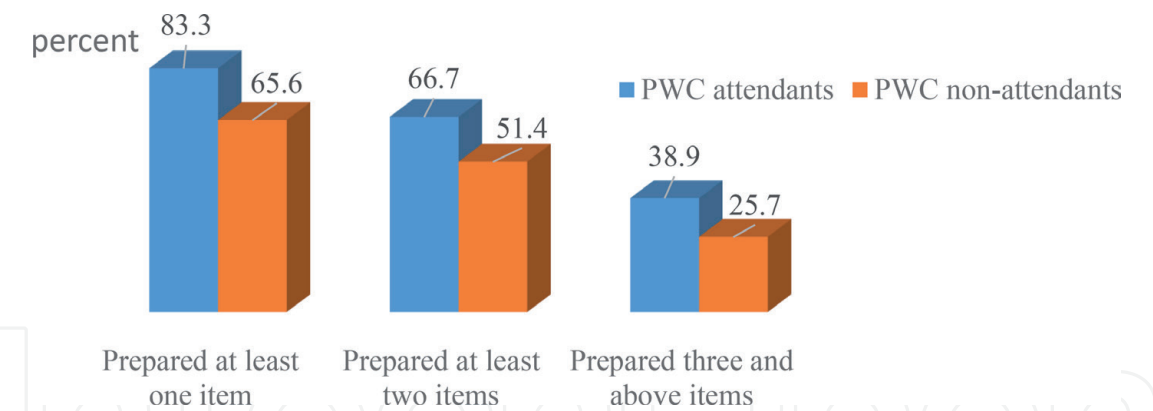


Figure 3. Well-preparedness during their last pregnancy among women who gave birth in the last 12 month, in the context of attending PWC, Northwest Ethiopia, 2017.

2.2.5 Well-preparedness practice during their last pregnancy

A mother was considered as “well-prepared for institutional delivery” if she prepared at least three items from the four key items (identified the skilled provider, saved money, planned health facility for delivery, and identified the mode of transportation) during her last pregnancy before the onset of labor. According, to the total, 38.9% of women who attended the PWC (95%CI: 33.8-43.7), and 25.7% of women who didn’t attend the PWC (95% CI: 22.2-29.4) were “well-prepared” for birth and its complication during their last pregnancy before the onset of labor (**Figure 3**).

2.2.6 Place of planned for delivery and delivery

Every woman was expected to choose a health institution for delivery, however, about 73.3% of PWC attendants and 54.4% of PWC non-attendant women only were planned health institutions to birth. Close attention from their families or relatives was the most frequently mentioned reason why they preferred home for birth (**Table 3**).

Variables	PWC non-attendants n1 (%)	PWC attendants n2 (%)
A planned place for the birth		
health institution	237(54.4)	319(73.3)
home	199(45.6)	116(26.7)
Why planned home for delivery (n1 = 199, n2 = 116)		
They feel more comfortable giving birth at home	121(60.8)	65 (56.0)
Close attention from their families and relatives	98(49.2)	54 (46.6)
Their usual practice	39(19.6)	19 (16.4)
They did not like the service provided in health facilities	29(14.6)	13 (11.2)
They had a bad experience giving birth at a health facility	4 (2.0)	2(1.7)
Their family’s preference	16(8.0)	3(2.6)
The unwelcoming approach of health care workers	5 (2.5)	2(1.7)

Table 3. The planned place for delivery and reasons to plan among women who gave birth in the last 12 months, in the context of attending PWC, Northwest Ethiopia, 2017.

Variables	PWC non-attendants n (%)	PWC attendants n (%)
Place of delivery		
At the health center	139(31.9)	206(47.4)
At hospital	35(8.0)	30(6.9)
Home	262(60.1)	199(45.7)
Why delivered at home after planned health institution (n1 = 88,n2 = 81)		
Labor was urgent to reach a health facility	28(31.8)	32(39.5)
Labor was coming at night and wait till dawn	32 (36.4)	47(58.0)
Lack of transport	25(28.4)	18(22.2)
Lack of person look after home and care children	15(17.0)	18(22.1)
Family members prefer to deliver at home	17(19.3)	8(9.9)
The birth outcome of the current delivery		
Alive	428(98.2)	432(99.3)
Stillbirth	8(1.8)	3(0.7)
Postnatal care in the current delivery		
At least 1 visit	141(32.3)	229(52.6)
At least 2 visits	59(13.5)	97(22.3)
3 and above visits	10(2.3)	23(5.3)
No visit	295(67.7)	206(47.4)

Table 4.
Institutional delivery among women who gave birth in the last 12 months, in the context of attending PWC, Northwest Ethiopia, 2017.

2.2.7 Institutional delivery

Overall institutional delivery was 47.1%(95%CI:43.4–50.9). It was 54.3% (95%CI: 49.9–59.1) among women who attended the PWC and 39.9% (95%CI: 35.3%-44.7%) among women who did not attend the PWC. Regarding postnatal follow up visits, only 22.3% of PWC attendants and 13.5% of PWC non-attendant were had two or more visits during the index birth (**Table 4**).

2.2.8 Factors associated with institutional delivery

Both bivariate and multivariable analyses were performed. As **Table 5** showed that during multivariable analysis variables such as knowledge on childbirth and postpartum danger signs, traveling time to reach the nearest health facility, well prepared for birth and its complication, and discussion with partners/families about the place of birth were significantly associated with institutional delivery in women who attended the PWC. Whereas among women who did not attend the conference knowledge on pregnancy danger signs, traveling time to reach the nearest health facility, and well prepared for birth and its complication were significantly associated with institutional delivery. Among women who attended the PWC those who were knowledgeable on childbirth danger signs were 1.7 times more likely to deliver at health institutions compared to women who were not knowledgeable on childbirth danger signs (AOR = 1.7, 95%CI: 1.2, 2.8).

Variables	PWC attendants				PWC non-attendants			
	I. delivery		COR	AOR	I. delivery		COR	AOR
	Yes	No			Yes	No		
Travel time to a nearby health facility								
<=1 hour on foot	181	66	6.6(4.3,10.1)	4.4(2.4,8.1) *	131	65	9.2(5.9,14.4)	7.8(4.4,13.7*)
>1 hour on foot	55	133	1	1	43	65	1	1
Discussed with partner/family about the place of birth								
No	15	104	1	1	46	149	1	
Yes	221	95	16.1(8.9,29.0)	7.7(3.6,16.4) *	128	113	3.7(2.4,5.6)	=====
Knowledge of at least two danger signs of pregnancy								
No	92	166	1		89	242	1	1
Yes	144	33	7.9(5.0,12.4)	=====	85	20	11.6(6.7,19.9)	3.6(1.6,8.1) *
Knowledge of at least two danger signs of childbirth								
No	64	134	1	1	85	159	1	
Yes	172	65	5.5(3.7,8.4)	1.7(1.2,2.8) *	89	67	3.0(2.0,4.6)	=====
Knowledge of at least two danger signs of postpartum								
No	113	195	1	1	115	261	1	
Yes	123	4	53.1(19.1,147.5)	14.0(4.6,40.0) *	59	1	133.9(18.3,978.3)	=====
Well prepared								
No	77	189	1	1	88	236	1	1
Yes	159	10	39.0(19.5,77.9)	8.8(3.9,19.8) *	86	26	8.9(5.4,14.7)	3.3(1.6,7.0) *
Key I. delivery=institutional delivery *=statically significant associated at p-value ≤ 0.05								

Key I. delivery=institutional delivery *=statically significant associated at $p\text{-value} \leq 0.05$

Table 5.

Factors associated with institutional delivery among women who gave birth in the last 12 months, in the context of attending PWC, Northwest Ethiopia, 2017.

Whereas, in women who did not attend PWC the Odds of institutional delivery among women who were knowledgeable on pregnancy danger signs were 3.6 times higher compared with their counterparts (AOR = 3.6, 95%CI: 1.6, 8.1) (**Table 5**).

2.3 Discussion

This study intended to assess the effectiveness of a community-based intervention called PWC on institutional delivery in the Northwest part of Ethiopia. Accordingly, institution delivery was higher among women who attended the PWC was 54.3% (95%CI: 49.9–59.1) compared to 39.9% (95%CI: 35.3%– 44.7%) in women who did not attend the PWC. Other previous studies supported this finding, Burkina Faso (56% VS 36%), Eritrea (46.8% VS 51.2), and Guatemala (54.7% VS 31.2%) [11–13], authors agreed that women who involved in the conference were informed about danger signs that may occur during delivery, which enable them to prefer health institution for delivery [14]. On the contrary of this finding, studies were done in Kenya (28% VS 37%), Bangladesh (10.5% VS 12.5%), and India (22.5% VS 21.8%) showed that the community-based interventions were not made difference on institutional delivery as compared to their counterpart [15, 16].

Similarly, knowledge of obstetric danger signs that may occur during pregnancy, labor, and postpartum was higher among women who attended the PWC compared to those women who did not attend the PWC. This finding was in line with the studies done in Eritrea, and Bangladesh [12, 16]. Conversely, this finding was contradicted with the studies done in Nepal and Bangladesh, which showed that obstetric danger signs knowledge of women who were involved in the intervention were similar or lower compared to women not participating in the interventions [17, 18].

About 39% of women who attended the PWC were well prepared for birth and its complication higher as compared to 28% of women who did not attend the PWC before the onset of labor, was supported with previous studies done in Burkina Faso, Eritrea, Nepal, and Tanzania the higher level of well-preparedness for birth and its complication was made among women who participated in the interventions [6, 12, 19, 20]. The explanation may be women who are involved in the intervention might be informed about obstetric danger signs and birth preparedness items which elicit them to be ready to give birth at a health institution.

The odds of institutional delivery among PWC attendant women who were knowledgeable about childbirth and postpartum danger signs were higher as compared to their counterparts. Then again, among PWC non-attendant women who were knowledgeable on pregnancy danger signs were more likely to institutional delivery compared to their counterparts. It was supported by the previous studies done in Ethiopia, Pakistan, and Tanzania [14, 21, 22]. The possible clarification may be realizing obstetric threat signs may impact women's perceptions about their susceptibility to and earnestness of the complications. This may motivate women to give birth at wellbeing offices [23].

The odds of institutional delivery among both groups of women who well-prepared for birth and its complication were higher as compared not prepared. The explanation may be women who were solid and steady for birth and its complexity may be proficient about obstetric danger signs that may happen before, during, and after birth; decidedly impact to delivery at a health facility.

Voyaging time from the closest health facility was essentially connected with institutional delivery in both women who joined in and did not go to the PWC. In both groups, women who lived within 1 h of strolling from the closest health facility

were more likely to institutional delivery contrasted with their counterparts. This finding was in line with other previous studies [14, 23–25]. The explanation may be an absence of methods for transportation to wellbeing offices. Secondly, fear of financial expense for transport may be contrarily affected to choose institutional delivery.

The odds of institutional delivery among PWC attendant women who had a conversation with partners/families about the place of birth were higher as compared to women who did not discuss. This may empower women to have self-rule in the decision of birthplace jointly or self alone. Women with the highest level of autonomy are most likely to seek institutional delivery [21, 26–28]. Also, this may set out a better opportunity for families to include in orchestrating transport, set aside cash, and assist mothers to choose a place of delivery.

2.4 Limitation of this study

The two group participants (PWC attendants and non-attendants) live at the same resident/kebele, there might be information contamination between attendants and non-attendants.

2.5 Conclusion

The proportion of institutional delivery was higher among women who attended the conference. Similarly, women's knowledge of obstetric danger signs and preparation for birth and its complication were higher among women who attended the conference. Knowledge on childbirth and postpartum danger signs, discussed with their partners/families about the place of delivery were associated with institutional delivery in Pregnant women's conference attendants. Distance from the nearest health facility and well preparedness for birth and its complication were associated with institutional delivery in both groups. Besides, knowledge of pregnancy danger signs was associated with institutional delivery in pregnant women's conference non-attendants.

Therefore, strengthening women to attend pregnant women's conferences may improve institutional delivery by increasing women's obstetric danger signs and birth preparedness knowledge. Furthermore, encouraging women to discuss with their families about the place of delivery should be strengthened.

For researchers, the authors recommended doing a further follow-up cluster-based study by considering a non-selected zone (buffer zone) between intervention and control groups to prevent information contamination, thereby, understanding the net effect of the intervention in the institutional delivery.

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Competing interests

The authors declare that they have no competing interests.

Ethical approval and consent to participate

Ethical clearance was obtained from the IRB committee of Bahir Dar University. Permission letter also received from the region, zonal department, and district health office. Written consent was obtained from each study participant. To ensure confidentiality identification such as name was not recorded. The purpose of the study was explained to each participant.

Author details

Melash Belachew Asresie* and Gizachew Worku Dagneu
Department of Reproductive Health and Population Studies, School of Public Health, College of Medicine and Health Sciences, Bahir Dar University, Bahir Dar, Ethiopia

*Address all correspondence to: kalleab1@gmail.com

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