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Birth Preparation and Complication Readiness among Antenatal Care Attendants in Bule Hora Governmental Health Facilities in Oromia Region, Ethiopia, in 2019

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ABSTRACT

Background & aim: Childbirth preparation has been globally supported as an important part of safe maternity program. Birth preparedness and complication readiness (BP and CR) aimed to reduce delays in seeking care, arrival, and care during childbirth and immediate postpartum period. The aim of this study was to assess the knowledge and practice of BP and CR, as well as its associated factors, among antenatal care attendants in Bule Hora town in the Oromia region in Ethiopia.

Methods: This facility-based cross-sectional study was conducted within February to June 2019. A total of 272 women were selected using systematic sampling and interviewed by previously tested structured questionnaires. Data analyzed using Epi Info (version 6.4) and SPSS software (version 25) with binary logistic regression and multiple logistic regression analyses.

Results: Out of 272 mothers, 46.3% practiced four or more BP and CR steps. Attendance in secondary school (OR=2.42; 95% CI: 1.73-5.48) and college or university (OR=4.12; 95% CI: 1.61-7.87), maternal occupation (OR=4.12; 95% CI: 2.64-9.69), having 1-3 (OR=1.49; 95% CI: 1.08-6.96) and higher than or equal to 4 prenatal visits (OR=3.54; 95% CI: 1.72-9.03), knowledge of main warning signs during pregnancy (OR=6.68, 95% CI: 4.80-11.77) and also during labor and childbirth (OR=4.54; 95% CI: 2.20-10.28), were independent predictors associated with BP and CR practice.

Conclusion: The level of BP and CR among women in the study area was low. In general, policymakers and planners should improve BP and CR in women and provide pregnant women, their families, and communities with associated information.

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Introduction

Globally, maternal mortality remains a challenge for general well-being (1). Every day in 2017, approximately 810 women died of preventable causes related to pregnancy and childbirth. During 2000 and 2017, the maternal mortality rate (MMR) reduced by around 38% worldwide. In addition, about 94 maternal mortalities have occurred in low- and middle-income countries (2).

Birth preparedness and complication readiness (BP and CR) are the important elements of focused antepartum care that involves preparing for normal childbirth and taking preventive actions in an emergency (3). The BP and CR include several parts, together with the pregnancy record, knowledge of danger signs, plan of a place to give birth, plan of a skillful birth, preparation for transport, delivery partner, and identification of compatible blood donors only in case of emergency (4).

In Ethiopia, maternal mortality remains one of the most serious challenges for the health sector. Regardless of whether the government of the Federal Democratic Republic of Ethiopia works to increase institutional deliveries, access to healthcare facilities in rural areas is more

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difficult than in urban areas due to the distance, inaccessibility, and lack of facilities. Although institutional delivery was promoted, there were 73 home deliveries in Ethiopia in 2016 (5).

Several studies have been identified according to which home birth was associated with young maternal age, low education, rural residence, low socioeconomic status, high birth order, no antenatal care (ANC) services, distance to health centers, and complications during childbirth (6). Although the MMR in the Federal Democratic Republic of Ethiopia remains high, the level has shown a gradual decline from 1,250 in 1990 to 353 in 2015 (7). According to the Sustainable Development Goals, the aim is to reduce the global MRR to 70 per 100,000 live births by 2030 without any country having an MMR higher than 140 per 100,000 live births (8).

Maternal mortalities have direct and indirect causes. About 80% of maternal mortalities are due to causes directly related to pregnancy and childbirth, unsafe abortions, and obstetric problems, such as severe bleeding, infection, hypertensive disorders, and obstructed labor, among pregnant women who have not visited a care provider and received inadequate medical treatment or care (9).

Many countries, mainly in Sub-Saharan Africa and South/Southeast Asia, still have unsatisfactory levels of four or more recommended prenatal care visits (10). The common reasons for maternal mortality in Ethiopia are demographic, behavioral, nutritional, and health-related factors. To date, the key elements attributed to the loss of mothers' lives are associated with the low deliveries of facilities, poor competence of providers, lack of emergency obstetric services in facilities, and inefficient bypass facilities for obstetric emergencies (11).

The results of a study conducted in Mekele, Ethiopia, in a similar area indicated that 66% and 19% of the participants mentioned at least one and two key danger signs during pregnancy, respectively (12). Likewise, a study carried out in Guraghe and Wolayta Zone, Ethiopia, on BP/ and CR indicated that 18.3% and 37% of the respondents were prepared for childbirth and its complications, respectively (13 14).

According to studies performed in different parts of the world, the promotion of BP and CR improves preventive behaviors, as well as mothers' perception of warning signs, and leads to better attention-seeking behaviors during an obstetric emergency. The present study provided background data on the topic that can help healthcare professionals and policymakers implement and expand the maternity programs in an effort to reduce the highest MMR and neonatal mortality rate in Ethiopia. No formal study has been carried out in West Guji, Ethiopia, on this topic; therefore, a basic study is required to determine the knowledge and practice of BP and CR.

Materials and Methods

This facility-based cross-sectional study was conducted in Bule Hora town in southern Ethiopia within February to June 2019. The town has an estimated population of 264,489 with 133,730 men and 130,759 women and two governmental health facilities. The study included pregnant women who had attended one or more ANC visits and met the inclusion criteria during the data collection period, and the excluded subjects were mothers who could not be mentally and physically interviewed, as well as pregnant women with emergency conditions.

The sample size was determined using a single population proportion based on the 95% CI and 5% margin of error with a prevalence of 29.9% related to a previous study conducted in Goba Woreda, Ethiopia and 10% of the no response rate. In 2018, 806 mothers were pregnant mothers who had ANC visits in governmental health facilities located in Bule Hora town (15).

The systematic sampling was applied to select study subjects from the study populations among antennal care attendants in governmental health facilities in Bule hora town. The study participants were chosen based on a sampling frame from the list of ANC records for both the health center and hospital across a range of three. The first subject of the study was selected using the lottery method.

In this study, the data collection tool included five components. Sociodemographic factors, obstetric factors, knowledge of respondents on danger signs in pregnancy, delivery and the postnatal period, as well as knowledge and practice of BP and CR. The BP and CR have seven

components. The respondent has good knowledge if she/he answers at least four items/components of BP and CR, and the respondent has poor knowledge if she/he answers three or fewer components. Moreover, the respondent has good practices if she/he practiced at least four components, and the respondent has poor practices if she/he practiced three or fewer components of BR and CR.

The translation into Afan Oromoo (i.e., the local language) and preliminary test of the research tool were carried out to ensure the quality of the data. The completeness of data was daily checked, and feedback was given to data collectors the next morning. Before data analysis, the data were entered and cleaned using Epi Info software (version 6.4). Furthermore, the completeness and inconsistencies were checked, and the data were entered into SPSS software (version 25.0). In addition to the descriptive statistics, binary logistic regression and multiple logistic regression analyses were performed to assess the strength of the statistical association of BP and CR with determining variables. The strength of the statistical association was measured by adjusted odds ratios and 95% CI. P-value less than 0.05 was considered statistically significant.

Ethical approval was obtained from the Research Unit of Bule Hora University. A letter of permission was obtained from the College of Health and Medical Sciences, and verbal consent was obtained from each study subject. The confidentiality of the participant information was ensured by omitting the names of the study subjects in the questionnaire, and an effort was made to preserve the privacy of the interviewees during the interview moments

Results

Out of 273 respondents, 272 (99.6%) subjects gave complete responses. The mean age of the respondents was 24.9±4.5 years. A total of 101 (37.1%) respondents were within the age range of 25-29 years. More than half (n=156; 57.4%) of the participants' monthly income was less than 2,000 Ethiopian birrs. The minimum and maximum monthly incomes of the subjects were 100 and 9000 birrs, with an average of 2,380.9±1,745.8 birrs, respectively (Table 1).

Table 1. Sociodemographic characteristics of respondents in assessment of knowledge and practice of birth preparedness and complication readiness among antenatal care attendants in Bule hora governmental health facilities in Bule hora town, Ethiopia, in 2019

Sociodemographic characteristics	Frequency (%)
Age (years) (n= 272)	
15-19	27(9.9)
20-24	92(33.8)
25-29	101(37.1)
30-34	43(15.8)
35-39	9(3.3)
Marital status (n=272)	
Single	6(2.2)
Married	257(94.5)
Widowed	9(3.3)
Educational status (n=272)	
Cannot read and write	54(19.9)
Primary school	123(45.2)
Secondary school	51(18.8)
College and university	44(16.2)
Maternal occupation (n=272)	
Housewife	121(44.5)
Organizational employee	59(21.7)
Farmer	13(4.8)
Private employee	40(14.7)
Merchant	38(14.0)
Others	1(.4)
Religion (n=272)	
Orthodox	78(28.7)
Muslim	41(15.1)
Catholic	7(2.6)
Protestant	146(53.7)
Residence (n=272)	
Urban	216(79.4)
Rural	56(20.6)
Family size (n=272)	
Less than 3 members	131(48.2)
3-6 members	106(39.0)
Larger than 6 members	35(12.9)
Monthly income (n=272)	
≤2,000 Ethiopian birrs	156(57.4)
2,001-3,000 Ethiopian birrs	56(20.6)
3,001-4,000 Ethiopian birrs	17(6.3)
≥4,001 Ethiopian birrs	43(15.8)

Almost more than half of the mothers (n=179; 65.8%) were aware of some serious health problems that can occur during pregnancy and endanger the lives of pregnant women and fetuses. They listed at least four warning signs during pregnancy. Most women responded to a

minimum of four warning signs during labor and delivery. About 190 (69.9%) respondents had knowledge of health problems that can occur during labor and delivery.

Table 2. Distributions of knowledge on key danger signs during pregnancy, labor and delivery, and postnatal period among antenatal care attendants in Bule hora governmental health facilities in Bule hora town, Ethiopia, in 2019

Variable	Frequency (%)
During pregnancy	
Vaginal bleeding	123(68.7)
Severe headache	119(66.5)
Blurred vision	128(71.5)
Convulsion	113(63.1)
Swollen hand and face	110(61.5)
High fever	76(42.5)
Severe abdominal pain	49(27.4)
During labor and delivery	
Severe vaginal bleeding	159(83.7)
Severe headache	133(70)
Convulsion	150(78.9)
Loss of consciousness	115(60.5)
High fever	119(62.6)
Labor lasting>24 h	101(53.2)
Retained placenta more than 30 min	98(51.6)
During postpartum period	
Vaginal bleeding	109(74.7)
Severe headache	42(28.8)
Blurred vision	39(26.7)
Convulsion	15(10.3)
Swollen face and hand	19(13)
High fever	10(6.8)
Severe abdominal pain	39(26.7)

The common complications were severe vaginal bleeding, severe headache, seizure, and unconsciousness. As for complications during the postpartum period, 146 (53.7%) women had good knowledge and responded to a minimum of four warning signs during the postpartum period. Some of the listed complications were vaginal bleeding, severe headache, blurred vision, convulsions, swelling of the face and hands, as well as high fever (Table 2). Most of the women (n=184; 67.6%) had good knowledge of the complications associated with newborn babies (Figure 1).

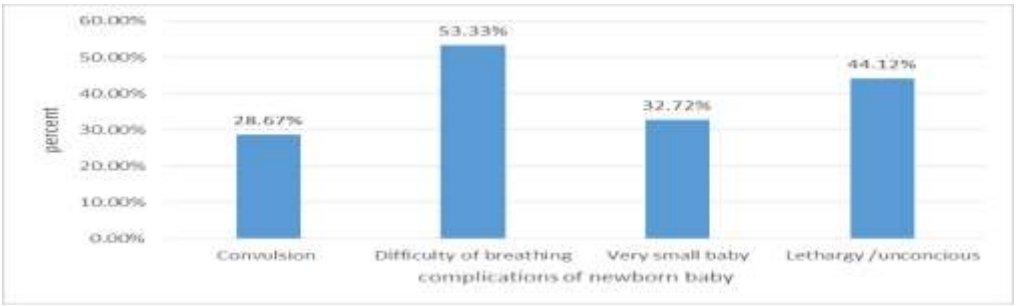

Figure 1. Complications of newborns mentioned by mothers' antenatal care attendants in Bule hora governmental health facilities in Bule hora town, Ethiopia, in 2019

Regarding the knowledge of BP and CR, 221 (81.3%) mothers heard of BP and CR during pregnancy, and the main sources of information were mainly health professionals (n=110; 49.8%) followed by neighbors (n=76; 34.4%) (Figure 2).

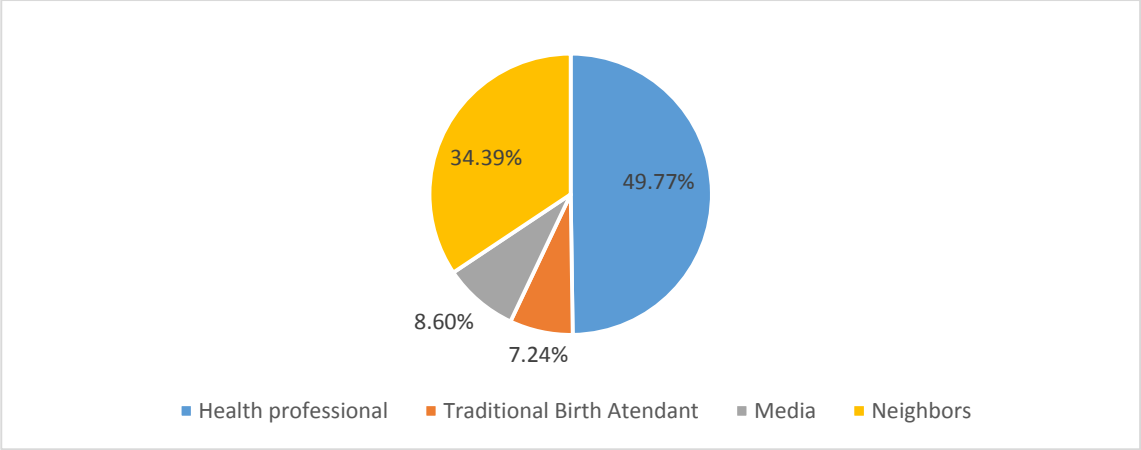

Figure 2. Distributions of information sources about birth preparedness and complication readiness mentioned by mothers' antenatal care attendants in Bule hora governmental health facilities in Bule hora town, Ethiopia, in 2019

In general, 144 (53%) women in this study were considered to have good knowledge of BP and CR, and the rest of them had little knowledge. As for BP and CR practices, over half of the subjects (n=191; 70.2%) saved money, 162 (59.6%) cases prepared essential items for a clean birth and postnatal period, and 153 (56.3%) women prepared the means of transportation (Figure 3).

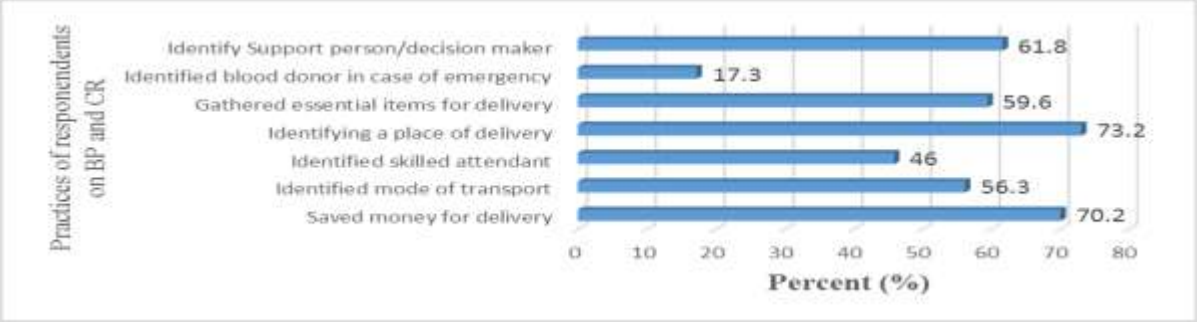

Figure 3. Characteristics of respondents with regard to practices of birth preparedness and complication readiness among antenatal care attendants in Bule hora governmental health facilities in Bule hora town, Ethiopia, in 2019

In addition, 126 (46.3%) mothers practiced four or more components of BP and CR, and most of the women in this study were considered less prepared for childbirth and associated complications.

Associated factors with birth preparedness and complication readiness

Factors influencing BP and CR were identified by binary logistic regression, and variables with p-value less than 0.25 were considered candidates for multiple logistic regression.

Table 3. Characteristics of respondents with regard to knowledge of birth preparedness and complication readiness among antenatal care attendants in Bule hora governmental health facilities in Bule hora town, Ethiopia, in 2019

No.	Knowledge of birth preparedness and complication readiness	Frequency (%)
1	Saved money for delivery	189 (69.5)
2	Identification of mode of transport	167(61.4)
3	Identification of skilled attendant	110(40.4)
4	Identification of a place of delivery	198(72.8)
5	Provision of essential items for delivery	121(44.5)
6	Identification of blood donor in case of emergency	98(36)
7	Identification of support person/decision-maker	123(45.2)

Table 4. Binary logistic regression and corresponding p-values for associations between practice of birth preparedness and complication readiness, as well as independent variables of mothers' antenatal care attendants, in Bule hora governmental health facilities in Bule hora town, Ethiopia, in 2019

Variable	Practice of BP and CR		P-value	COR (95% CI)
	Not prepared	Well prepared		
Age (years)				
<20	35	21	0.178	0.76 (0.36-3.68)
20- 24	38	25	0.021	2.65 (2.21-6.04)
25-29	44	57	0.013	2.01 (1.23-5.46)
≥30	38	14	1	
Marital status				
Married	151	106	0.52	0.4 (0.34-2.92)
Others	10	5	1	
Educational status (n=272)				
Cannot read and write	35	19	1	
Primary school	65	58	0.01	3.34 (2.91-6.70)
Secondary school	22	29	0.05	6.87 (3.67-11.84)
College and university	18	26	0.04	8.12 (4.21-9.54)
Maternal occupation (n=272)				
Housewife	73	48	0.48	0.68 (0.83-3.67)
Organizational Employee	21	38	0.000	3.12 (2.53-5.70)
Merchant	14	15	0.44	0.74 (0.55-8.43)
Farmer	8	5	0.01	1.89 (1.31-9.87)
Private employee	23	17	1	
ANC visits (n=272)				
1 visit	26	15	1	
2-3 visits	66	56	0.030	2.61 (2.20-8.84)
≥4 visits	41	68	0.002	4.12 (2.16-9.71)
Knowledge of danger signs during pregnancy				
Good knowledge	61	118	0.04	3.00 (3.81-9.13)
Poor knowledge	33	64	1	
Knowledge of danger signs during labor				
Good knowledge	65	125	0.02	1.72 (1.20-8.28)
Poor knowledge	28	54	1	
Knowledge of danger signs during postnatal period				
Good knowledge	50	96	0.08	1.38 (0.97-2.32)
Poor knowledge	44	86	1	
Knowledge of BP and CR				
Good knowledge	28	89	0.001	5.79 (8.10-10.12)
Poor knowledge	118	37	1	

BP and CR: Birth preparedness and complication readiness, ANC: Antenatal care

Therefore, the variables associated with BP and CR were maternal age, marital status, maternal educational status, maternal occupation, ANC visits, knowledge of the danger signs during pregnancy, knowledge of warning signs during childbirth, knowledge of warning signs during the postpartum period, as well as knowledge of preparation for delivery and complications (Table 4).

Table 5. Multiple logistic regression and corresponding p-values for associations between practice of birth preparedness and complication readiness, as well as independent variables of mothers' antenatal care attendants, in Bule hora governmental health facilities in Bule hora town, Ethiopia, in 2019

Variable	Practice of BP and CR		P-value	AOR (95% CI)
	Not prepared	Well prepared		
Educational status				
Cannot read and write	35	19		1
Primary school	65	58	0.18	1.8 (0.63-4.50)
Secondary school	22	29	0.05	2.42 (1.73-5.48)
College and university	18	26	0.02	4.12 (1.61-7.87)
Maternal occupation				
Housewife	73	48	0.88	0.68 (0.83-3.67)
Governmental Employee	21	38	0.000	4.12 (2.64-9.69)
Farmer	8	5	0.43	0.8 (0.31-5.87)
Private employee	23	17		1
ANC Visit				
1 visit	26	15		1
2-3 visits	66	56	0.044	1.49 (1.08-6.96)
≥4 visits	41	68	0.001	3.54 (1.72-9.03)
Knowledge of danger signs during pregnancy				
Good knowledge	61	118	0.034	6.6 (4.80-11.77)
Poor knowledge	33	64		1
Knowledge of danger signs during labor				
Good knowledge	65	125	0.021	4.54(2.20-10.28)
Poor knowledge	28	54		1
Knowledge of BP and CR				
Good knowledge	28	89	0.029	3.69(2.67-13.16)
Poor knowledge	118	37		1

BP and CR: Birth preparedness and complication readiness **ANC:** Antenatal care

Among the sociodemographic and economic characteristics, it was observed that the educational status and occupations of mothers had statistically significant associations with the practice of BP and CR. The mothers who attended secondary school and college or university were 2.42 (OR=2.42; 95% CI: 1.73-5.48) and 4.12 (OR=4.12; 95% CI: 1.61-7.87) times well prepared for BP and CR, compared to those who could not read and write, respectively. The women who were organizational employees were 4.12 (OR=4.12; 95% CI: 2.64-9.69) times more likely to be prepared than women who were private employees.

Among the factors related to obstetrics, the frequency of ANC visits, knowledge of the main warning signs during pregnancy, knowledge of the main warning signs during labor and delivery, and knowledge of BP and CR had significant associations with the practice of BP and CR. The ANC visits were also among the strong predictors of BP and CR practice. The mothers who had 1-3 visits and higher than or equal to 4 visits were 1.49 (OR=1.49; 95% CI: 1.08-6.96) and 3.54 (OR=3.54; 95% CI: 1, 72-9.03) times more likely to be prepared for BP and CR, compared to those who attended ANC visits once, respectively.

The women who were aware of four main warning signs during pregnancy were 6.68 (OR=6.68; 95% CI: 4.80-11.77) times more likely to be prepared for BP and CR than those who had poor knowledge in this regard. The subjects who were aware of four main warning signs during labor and delivery were 4.54 (OR=4.54; 95% CI: 2.20-10.28) times more likely to be prepared for BP and CR than those with poor knowledge of danger signs during labor and delivery. Similarly, there was a very significant association between mothers with good knowledge of BP and CR components with the practice of BP and CR. The mothers who had good knowledge were 3.69 (OR=3.69; 95% CI: 2.06-16.19) times more likely to increase the practice of BP and CR than those who had poor knowledge of BP and CR (Table 5).

Discussion

This cross-sectional study aimed to assess the knowledge and practice of BP and CR among ANC attendants mothers in the government health care facilities of Bule hora town. According to the obtained results, it was observed that the frequency of women who were well-prepared for BP and CR was 46.3%. This finding is relatively consistent with studies conducted in Dire Dawa, Ethiopia (54.7%) (16), Southwest Nigeria (40.3%) (17), and Gurage, Ethiopia (37%) (13). This figure is higher than those reported in studies conducted in Wolaita, Ethiopia (18.3%) (14), Goba, Ethiopia (29.9%) (15), and Nepal (34.2%) (18).

The difference could be due to the fact that the present study was performed in an urban area on populations with better access and knowledge of health information, including the knowledge of BP and CR. On the other hand, the results of studies conducted in West Bengal, India, (57%) (19) and Sokoto in Nigeria (92.0%) (20) showed that they practiced BP and CR more frequently than those reported in the present study. The discrepancy could be due to better access to health information and healthcare services with qualified health professionals.

The obtained results of this study showed that maternal educational status had a statistically significant association with the practice of BP and CR. Therefore, mothers who attended secondary school and college or university were two and four times better prepared for BP and CR, compared to those who could not read and write, respectively. This finding is consistent with the results of studies conducted in Dire Dawa, Oromia, Ethiopia (16), Goba, Ethiopia (15), Nepal (18), and Dere Teyera Harari, Ethiopia (21). Educated women can predict the possible outcome of BP and CR and understand the importance of planning birth and adherence to the provided advice in ANC visits. As educational levels of women increase their practice of birth preparedness and complication readiness will rises.

Regarding the occupation of women, women who were organizational employees were four times more likely to be prepared for BP and CR practice than women who were private employees. In addition, ANC visits were also among the strong predictors of BP and CR practice. Women who had 1-3 visits and higher than or equal to 4 visits were 1.49 and 3.54 times more likely for BP and CR practice, compared to those who attended ANC visits once and lower than that, respectively. This finding is similar to the results of studies conducted in Wolaita (14), Goba, Ethiopia (15), Nepal (18) and Dere Teyera Harari, Oromia, Ethiopia (21). The possible justifications for its similarity are ANC visits that provide an opportunity to inform pregnant women and help plan for the important components of BP and CR.

The results of the present study also revealed that the knowledge of the main danger signs during pregnancy, as well as during labor, delivery, and the postpartum period, had a statistically significant association with the practice of BP and CR. Some mentioned danger signs included vaginal bleeding (68.7%), severe headache (66.5%), blurred vision (71.5%), convulsions (63.1%), and swollen hands and face (61.5%). This finding is relatively consistent with the results of studies conducted in Gurage, Ethiopia (13), Wolaita, Ethiopia (14), Dire Dawa, Ethiopia (16), Goba (15), Nepal (18), and Dere Teyera Harari (21).

The awareness of the danger signs of obstetric complications is the first step in the correct and timely rearrangement of essential obstetric care. This may be due to advice on pregnancy risks and importance of BP and CR

administered during ANC visits. Health education during the ANC visits also increases the knowledge of main warning signs and develops a favorable attitude that improves BP and CR.

There was a strong association between good knowledge of the components of BP and CR with the practice of BP and CR. The mothers who had good knowledge were 3.69 times more likely to increase BP and CR practice than those who had poor knowledge of BP and CR. It is important to enhance knowledge to be prepared for childbirth and emergencies. In this regard, efforts are required to identify obstacles for the use of healthcare facilities and qualified birth attendants, and BP and CR can be used as a reference link while assisting women in healthcare facilities during pregnancy. The limitations of this study could be the response bias and social desirability bias. In addition, the study did not include an in-depth interview.

Conclusion

The rate of BP and CR practice among women in the study area was low. Although more than half of the mothers (65.8%, 69.9%, and 53.7%) had good knowledge of the health problems and complications that can occur during pregnancy, childbirth, and postnatal period, respectively, there is still a high frequency of women who were not ready for childbirth and associated complications.

The frequency of mothers who responded to at least four BP and CR items was 53%, and the rest had poor knowledge in this regard. Out of the seven components of BP and CR practices, the frequency of the women who practiced four or more parameters was 46.3%. The educational status of the mother, maternal employment, ANC visits, knowledge of the main warning signs during pregnancy, labor, and childbirth, as well as knowledge of the components of BP and CR, were independent predictors associated with BP and CR practice.

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Conflicts of interest

Authors declared no conflicts of interest.

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