Journal of the Postgraduate Institute of Medicine 2019; 6 (1): E84 1-12
http://doi.org/10.4038/jpgim.8194

Original Article

Birth preparedness, complication readiness and associated factors among pregnant women seeking antenatal care at a Medical Officer of Health (MOH) area in Sri Lanka

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Keywords: Obstetric emergencies, birth plan, antenatal care

Abstract

Background
Obstetric emergencies need prior preparation. 'Birth Preparedness and Complication Readiness' (BPCR) is a concept that promotes timely maternal care (WHO 2006).

Objectives
This study assessed BPCR and associated factors among pregnant women attending antenatal clinics in MOH area Padukka.

Methods
This descriptive cross-sectional study was conducted among a sample of 280 pregnant women in the year 2014 in MOH area Padukka. Pregnant women in the third trimester were randomly selected from the Expected Date of Deliveries register available with the Public Health Midwives. Data were collected using a pre-tested interviewer administered questionnaire. Data collected included assessment of BPCR using 8 components; (i) choosing the desired place of birth, ii) identifying the closest care facility, (iii) saving funds for birth-related expenses, (iv) saving funds for emergency expenses, (v) arranging a person to accompany the pregnant woman, (vi) arrangements to look after the home and other children while the woman is away, (vii) arranging transport to the desired place of birth and viii) arranging transport for an obstetric emergency. Assessment of associated factors included details of pregnancy and antenatal care, discussing BPCR plan with healthcare provider, discussing BPCR plan with spouse and attitudes and perceptions on BPCR. Satisfactory BPCR was defined as 'accomplished a sore of 75% or more in the BPCR plan'.

Results
Response rate was 95.9% (n=269). Satisfactory BPCR was seen among 86.2% (n=232) participants. More than 75.0% (n=207) of participants had favourable attitudes towards BPCR, while 68.6% n=185) had favourable perceptions on available BPCR services. A satisfactory BPCR was significantly associated with planned pregnancy ($p<0.0001$), registration ≤8 weeks ($p<0.002$), ≥5 ANCs ($p<0.01$), ≥1 antenatal classes ($p<0.0001$), discussing with healthcare provider ($P<0.0001$), spouse attending antenatal classes ($p<0.0001$) and having favourable attitudes/perceptions ($P< 0.0001$).

Conclusion
A high proportion of pregnant women had satisfactory BPCR but attitudes and perceptions on BPCR services need to be improved.

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Received: September 2018, Accepted revised version: January 2019, Published: March 2019
Competing Interests: Authors have declared that no competing interests exist

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Introduction

Pregnancy and childbirth related complications lead to significant maternal morbidity and mortality in low-resource settings [1]. Although majority of these events are preventable, delays during an obstetric emergency can significantly worsen the outcome of a pregnancy. Delays could occur while seeking and reaching for care by pregnant women or while treating patients by healthcare providers [2]. Poor preparation is a main contributor to delay in 'seeking' and 'reaching' for medical care by pregnant women and is a barrier to improving maternal and neonatal outcomes in a country.

Many women find difficulty in making critical decisions due to the lack of a previously laid down plan. Birth preparedness and complication readiness (BPCR) is an important concept for reducing delays in 'seeking' and 'reaching' for medical care. The World Health Organization (WHO) standards for maternal and neonatal care recommends having a written plan for birth related activities and emergencies. BPCR plan as outlined by the WHO includes "1) the desired place of birth; 2) the preferred birth attendant; 3) the location of the closest facility for birth and in case of complications; 4) funds for any expenses related to birth and in case of complications; supplies and materials necessary to bring to the facility; 5) an identified labor and birth companion; 6) an identified support to look after the home and other children while the woman is away; 7) transport to a facility for birth or in the case of a complication; and 8) identification of compatible blood donors in case of complications." [3].

A BPCR plan promotes timely, skilled care for mothers and newborns during unexpected danger situations. By preparing a BPCR plan, a pregnant woman and her family actively participates in the decision-making process and this enables them to be responsible stakeholders in the events surrounding child birth. However, it has been shown that pregnant women who wish to make plans for child birth could face significant constraints within the social network they live in [4].

Sri Lanka claims great achievements in maternal health compared to other developing countries. By the end of 2013 the maternal mortality ratio in Sri Lanka had dropped to 32.5 per 100 000 live births [5]. However, recently, the maternal mortality ratio has shown only a slow decline when compared to previous years. Analysis of the maternal mortality data for 2012 in Sri Lanka, by the Family Health Bureau, revealed that 75(56%) of the 134 confirmed maternal deaths were preventable and 95(71%) women did not seek care on time [5].

Delays in seeking and reaching for care by pregnant women could be prevented by preparing pregnant women, their spouses and their families to face birth and related emergencies. The Family Health Bureau, Ministry of Health, Sri Lanka has recently introduced a 'birth and emergency preparedness plan' to the antenatal record. In this background, this study was conducted with the aim of describing BPCR level among Sri Lankan pregnant women and associated factors.

Methods

A descriptive cross-sectional study was conducted in the Medical Officer of Health (MOH) area Padukka of the Colombo District, Sri Lanka. The study population comprised pregnant women attending antenatal clinics who were in the third trimester. The estimated sample size was 280 [6]. Since there were no published data on BPCR among Sri Lankan pregnant women at the time of the study, the estimate of the proportion was considered as 50% and precision was taken as 0.06. Data were collected from May to October 2014.

The total sample of 280 was divided proportionate to the population size of the 12 public health midwife (PHM) areas of MOH area, Padukka. Pregnant women in the third trimester were listed out from each public health midwife's 'register of expected dates of deliveries'. Pregnant women were chosen by simple random sampling using this list and were invited to participate in the study during the next clinic visit. Pregnant women in the third trimester were selected for the study because BPCR is likely to depend on the period of gestation and is expected to be highest in the third trimester. Data was collected by trained data collectors using a pre-tested interviewer administered questionnaire during the waiting period at the antenatal clinics. The data collectors were graduates and were not employed with the Ministry of Health. Those who were eligible and willing but could not participate were interviewed at the next clinic visit or at home. Informed written consent was obtained prior to data collection.

The primary outcome variable, BPCR, was measured using a scoring system. The scoring system was adopted from the 'birth and emergency preparedness plan' published by the WHO [3] and consisted of eight components. The original 'birth and emergency preparedness plan' was modified to suit the Sri Lankan context by removing two original components and dividing two of the remaining components into two. The two components from the ‘birth and emergency preparedness plan' published by the WHO which were considered not relevant to the Sri Lankan setting were; 2) the preferred birth attendant; and 8) identification of compatible blood donors in case of complications.” Component 2 was considered not relevant because in Sri Lanka 99.9% deliveries take place in healthcare institutions and are assisted by skilled birth attendants [5]. Component 8 was considered not relevant because Sri Lanka has a very efficient blood transfusion service. Hence these BPCR components were removed in the scoring system used in our study and were replaced by dividing two other elements into two; 4) funds for any expenses related to birth and in case of complications; supplies and materials necessary to bring to the facility into iii) saving funds for birth-related expenses and iv) saving funds for emergency expenses and 7) transport to a facility for birth or in the case of a complication into vii) arranging transport to the desired place of birth and viii) arranging transport for an obstetric emergency.

Hence the final scoring system of this study was composed of the following eight components; i) choosing the desired place of birth, ii) identifying the closest care facility, iii) saving funds for birth-related expenses, iv) saving funds for emergency expenses, v)

arranging a person to accompany the pregnant woman, vi) arrangements to look after the home and other children while the woman is away, vii) arranging transport to the desired place of birth and viii) arranging transport for an obstetric emergency. The validity of these modifications were assessed and approved by a panel of experts involved in the national program for maternal and child health at the Family Health Bureau, Ministry of Health. The participants answered 'arranged' or 'not arranged' for each component depending on whether they have accomplished that BPCR component or not.

Socio-economic-demographic factors (education level, monthly family income, occupation etc.), obstetric history related factors (parity, past obstetric complications, planning of pregnancy etc.), family factors (number of living children) and service factors (registering with the PHM before 8 weeks, attending antenatal clinics, attending antenatal classes, discussing the birth preparedness plan with the healthcare worker, receiving heath education via media on BPCR etc.) which were considered to be associated with BPCR were collected using the interviewer administered questionnaire. Attitudes and perceptions on BPCR and available services were assessed using a Likert scale. Face validity and content validity of the final study instrument was assessed by a panel of experts consisting of Consultants in Community Medicine and Obstetrics and Gynecology.

Data were analyzed using SPSS 17 software. Each BPCR component, if accomplished, was given an un-weighted mark and a composite score was calculated per participant. Participants were considered to have satisfactory BPCR if they had accomplished ≥ 75% of the total score and the cutoff point was decided based on the median score. Attitudes and perceptions on BPCR were categorized as favourable and unfavourable based on a mean attitude and perception score. Chi square test was used to evaluate associated factors ($p>0.05$).

Administrative clearance was obtained from the Provincial Director of Health Services, Western Province and ethics clearance was obtained from the Ethics Review Committee of the Faculty of Medicine, Colombo.

Results

The response rate was 95.9% (n=269). Age of pregnant women ranged from 17 years to 43 years with a median of 29 years (IQR; 25-32 years). Table 1 outlines their socio-demographic characteristics.

Of the pregnant women, 35.4% (n=95) were in their first pregnancy while 255(57.6%) had at least one living child. Only 4.5% (n=12) of the women reported a past history of still birth while 23(8.6%) had faced at least one obstetric complication in their previous pregnancies. Thirteen (4.8%) had been diagnosed with a medical condition before this pregnancy and eight (3.0%) had been diagnosed with a medical condition during this pregnancy**.** Of them 226(84.0%) had planned the current pregnancy.

Table 1: Distribution by socio-demographic characteristics (n=269)

Characteristics	N (%)
Age distribution (years)	
15-24	57(21.2)
25-34	175(65.1)
35-44	37(13.8)
Ethnicity	
Sinhala	267(99.3)
Other	2(0.8)
Religion	
Buddhism	267(99.3)
Other	2(0.8)
Highest level of education	
Never attended school	2(0.7)
Grade one to five	8(3.0)
Up to G. C. E. Ordinary level	167(62.1)
Passed G. C. E. Advanced level	61(22.7)
Diploma and above	31(11.5)
Employment Status	
Employed	66(24.5)
Unemployed	203(75.5)
Monthly Family Income (Rupees)	
<10000.00	44(16.4)
=>10000.00	225(83.6)

Table 2 describes the antenatal care received by the pregnant women. Majority of the women 218(81%) had registered with the PHM by the 8th week of pregnancy while 157(58.4%) of them had participated in at least 5 antenatal clinics. At least one of the three antenatal classes was attended by 219(81.5%) of the women.

Table 2: Information on antenatal care (n=269)

Characteristics	N(%)
Registered with the PHM	
at POA≤ 8 weeks	218(81.0)
at POA> 8 weeks	51(18.9)
Number of MOH clinic visits	
<5 visits	112 (41.6)
≥5 visits	157(58.4)
Number of PHM home visits	
<2 visits	101(37.5)
≥2 visits	168(62.5)
Antenatal class attendance	
None	50 (18.6)
≥ one class	219(81.5)
Spouse participation in antenatal classes	
Participated	198(73.6)
Not participated	71(26.4)

Of the pregnant women 232(86.2%) scored 75% and above for BPCR practices (Table 3).

Table 3: BPCR practices among pregnant women

	BPCR Practice	Yes N(%)	No N(%)
1	Decided on a facility to give birth	263(97.3)	6(2.2)
2	Planned a mode of transport to reach the desired place of child birth	258(95.9)	11(4.1)
3	Saved / planned to get the average expenditure for child birth	251(93.3)	18(6.7)
4	Identified the closest care facility to go in an emergency	140(52.0)	129(48.0)
5	Planned a mode of transport for an emergency	246(91.4)	23(8.6)
6	Saved/made the necessary arrangements for funds/finances in case of an emergency	249(92.6)	20(7.4)
7	Arranged for someone accompany the pregnant woman	253(94.1)	16(5.9)
8	Arranged for someone to look after the home and children while the pregnant woman is away	141(88.6)	18(11.4)

More than 75.0% (n=207) of the pregnant women had favourable attitudes towards BPCR, while more than two thirds (68.6% n=185) had favourable perceptions on available BPCR services (Table 4).

Over 80.0% (n=217) had heard, read or seen information about BPCR on the media during the past six months. Of the pregnant women 75.8% (n=204) had discussed their BPCR plan with a health care provider (PHM 84.0%, MOH/AMOH 23.4%, Specialist 21.9%, GP/family practitioner 7.1%) while 69.5% (n=187) had discussed their BPCR plan with their spouse.

Table 4: Attitudes on BPCR and perceptions on available BPCR services

	Attitude/Perception	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
		N (%)	N (%)	N (%)	N (%)	N (%)
1	A woman should plan ahead of time where she will give birth to her baby	149 (55.4)	116 (43.1)	2 (0.7)	2 (0.7)	0 (0.7)
2	A woman need not plan ahead of time how she will get to the place where she will give birth	0 (0)	2 (0.7)	3 (1.1)	127 (47.2)	137 (50.9)
3	It is not necessary for a husband/partner to accompany his wife to antenatal classes	29 (10.8)	50 (18.6)	23 (8.6)	124 (46.1)	43 (16.0)
4	It is not necessary for a husband/partner to accompany his wife when she is giving birth	26 (9.7)	53 (19.7)	36 (13.4)	126 (46.8)	28 (10.4)
5	Giving birth is mostly a woman's matter and that spouse has little to contribute	14 (5.2)	22 (8.2)	30 (11.2)	134 (49.8)	69 (25.7)
6	Complication readiness is only for high risk mothers.	17 (6.3)	47 (17.5)	19 (7.1)	157 (58.4)	29 (10.8)
7	Women do not prepare for childbirth and complications mainly because health care providers don't encourage them.	7 (2.6)	19 (7.1)	27 (10.0)	178 (66.2)	38 (14.1)
8	Women can give birth even in a small health facility if there is a labour room with trained birth attendants	19 (7.1)	163 (60.6)	34 (12.6)	41 (15.2)	12 (4.5)
9	Most women with post-partum complications are taken to health care facilities if they become very serious only.	18 (6.7)	86 (32.0)	30 (11.2)	120 (44.6)	15 (5.6)
10	In this area healthcare providers know what kind of preparedness is needed during pregnancy, child birth and post-partum period	103 (38.2)	141 (52.4)	6 (2.2)	12 (4.5)	7 (2.6)
11	Most of the time healthcare workers do not take prompt action in emergencies	19 (7.1)	39 (14.5)	32 (11.9)	143 (53.2)	36 (13.4)
12	Private care institutions provide better delivery and emergency care than government institutions.	14 (5.2)	36 (13.4)	68 (25.3)	127 (47.2)	24 (8.9)

Table 5 outlines the factors associated with satisfactory BPCR. Satisfactory BPCR was significantly associated with planned pregnancy (p<0.0001), registration at ≤8 weeks of POA (p<0.002), attending ≥5 antenatal clinic visits (p<0.01), attending ≥1 antenatal classes (p<0.0001), discussing BPCR with a healthcare provider (P<0.0001), spouse attending antenatal classes (p<0.0001) and having favourable attitudes/perceptions towards BPCR (p< 0.0001).

Table 5: Associations between selected factors and BPCR

Characteristic	Satisfactory BPCR (n=232) N(%)	Unsatisfactory BPCR (n=37) N(%)	Total (n=269 N(%))	Significance
Planning of pregnancy				
Planned	204(87.9)	22(59.5)	22 (84.0)	X^2= 19.261 df=1 P<0.0001
Not planned	28(12.1)	15(40.5)	43(16.0)	
Registration with PHM				
=<8 weeks	195 (84.1)	23 (62.3)	218 (81.0)	X^2= 9.952 df=1 p= 0.002
>8 weeks	37 (15.9)	14 (43.7)	51(19.0)	
Clinic attendance				
< 5 clinics	89(38.4)	23(62.2)	112(41.6)	X^2= 6.498 df=1 P= 0.01
=>5 clinics	142(61.6)	15(37.8)	157(58.4)	
Antenatal classes				
Attended at least one	199(85.7)	20(54.1)	219(81.4)	X^2=21.220 df=1 P<0.0001
Never attended	33(14.3)	17(45.9)	50(18.6)	
Overall attitude				
Favourable	196(84.5)	11(29.70	207(76.8)	X2= 53.938 df=1 P<0.0001
Unfavourable	36(15.5)	26(70.3)	62(23.2)	
Overall perception				
Favourable	173(74.6)	12(32.4)	185(68.6)	X2=26.382 df=1 P<0.0001
Unfavourable	59(25.4)	25(67.6)	84(31.4)	
Discussed with healthcare provider				
Yes	194(83.6)	10(27.0)	204(75.8)	X^2= 55.774 df=1 P < 0.0001
No	38(16.4)	27(73.0)	65(24.2)	
Spouse attendance for antenatal classes				
Attended at least one	209(86.0)	7(36.8)	216(80.3)	X^2=51.827 df=1 P < 0.0001
Never attended	34(14.0)	19(63.2)	53(19.7)	

Discussion

Birth preparedness has been mostly studied in low resource settings. A study from Uganda has shown birth preparedness to be 35% among pregnant women [7], while Ekabua *et al*., in their study in Nigeria, found that less than half of pregnant women are adequately prepared for birth and related complications [8]. Even in neighboring South Asian countries like India, Nepal etc. BPCR has been found to be comparatively low. For example, in a study from Nepal, the level of birth preparedness was only 65% [9].

The different rates of BPCR seen in developing countries can be explained by differences in their economic development, literacy rate and health infra-structure. Results from our study shows that BPCR in Sri Lanka (86.2% n=232) is high when compared to other developing countries. This finding is in agreement with the fact that Sri Lanka has better maternal and child health indicators compared to most other low- and middle-income countries. In most developing countries a substantial proportion of deliveries take place at home, compared to Sri Lanka where 99.9% of deliveries take place in health institutions and are attended by skilled birth attendants [5]. Sri Lanka has a well-functioning national blood transfusion service. Hence, 'identifying a blood donor' and 'identifying a skilled birth attendant' which are components in the WHO BPCR plan were not assessed as BPCR components in this study. However, in studies from other developing countries these components have also been assessed [7,8,9].

Implementation of a BPCR package in Siraha, Nepal in 2003 – 2004 led to an increase in the level of preparedness from 33% to 54% among antenatal women [9]. Studies have demonstrated that implementation of 'BPCR packages' improves care-seeking during obstetric emergencies. In a study conducted in Afghanistan, in addition to the nature and severity of symptoms, access to social networks, receipt of antenatal care and having a birth plan reduced the delay in seeking care in an obstetric emergency [10].

The new maternal care package of Sri Lanka introduced the concept of 'developing a birth and emergency plan' for field health services in the year 2012 [11]. The new comprehensive pregnancy record requires the PHM to fill a 'Birth and Emergency Preparedness Plan' after discussing with the pregnant woman and her spouse. According to the new package, antenatal classes are conducted for pregnant women and their spouses with the aim of providing knowledge and guidance necessary to face child birth safely and successfully. These recent developments in maternal care services in Sri Lanka may have contributed to the high BPCR seen in this study.

Our findings in relation to factors associated with BPCR are supported by studies around the world. Early initiation of antenatal care is known to facilitate better birth preparedness [4] as was demonstrated in our study. Similarly, in a study from Ethiopia, BPCR was shown to be eight times greater among women who had antenatal clinic follow up compared with women who did not (AOR = 8.07, 95% CI = 2.41,27.00) [12]. Having favourable attitudes was found to be significantly associated with a satisfactory level of BPCR in this study ($p<0.0001$). Similarly, a study among pregnant women in Ethiopia, showed that

favorable attitudes increase BPCR among pregnant women [13]. Discussing the BPCR plan with the healthcare provider was significantly associated with satisfactory BPCR in our study (X^2= 55.774, Df=1, P < 0.0001). Similarly, a study from north Ethiopia showed that women who were exposed to birth preparedness advice had better BPCR (OR 2.5, 95% CI 1.62, 3.88) [14].

In the present study, out of the pregnant women who had discussed their BPCR plan with a health care provider, 84% (n=226) had done so with the PHM. This highlights the role of the PHM in preparing pregnant women for birth and emergencies.

A majority of this study population was ethnically and culturally homogenous. As Sri Lanka is a multi-ethnic, multi-religion country, this study may not reflect variations in BPCR practices in various ethnic and religious sub entities living in other geographic areas. The descriptive cross-sectional nature of this study gives only a snap shot of the existing situation. The questionnaire needs to be validated for Sri Lanka. Social-desirability response bias: recall bias etc. could have had some influence on the data despite measures to minimize them.

Conclusion and Recommendations

A high proportion of pregnant women in the third trimester, seeking antenatal care at the MOH Padukka had satisfactory BPCR. However, one fourth of the pregnant women did not have favourable attitudes towards the concept and one third of the women did not have favourable perceptions on the services available in their area. Antenatal clinics and antenatal classes are important preparatory sessions for the pregnant women as shown by the significant association between adequate BPCR and attendance at antenatal clinics and classes. This study further shows that spouse participation at antenatal classes helps women to prepare for child birth better.

Discussing the birth preparedness plan with the healthcare worker has increased BPCR. The PHM has acted as the main healthcare worker who conveyed messages and mediated the preparation of the birth preparedness plan. PHMs should be empowered and used as change agents to create a behavioral and attitudinal change among those with unsatisfactory BPCR practices.

BPCR levels as well as reasons for high or low levels need to be explored as appropriate to the local context. Thus, we recommend that future research on BPCR should be conducted in other parts of the country as well. This will help the government to prioritize, allocate resources and plan programs.

Public health implications of the study

- Preparedness for birth and related emergencies is important to prevent adverse maternal and neonatal outcomes
- Birth preparedness and complication readiness (BPCR) of pregnant women in the given Medical Officer of Health area is satisfactory
- A significant proportion of pregnant women do not have favourable perceptions towards the BPCR services locally available to them
- BPCR level of pregnant women is significantly associated with attending antenatal classes, having satisfactory knowledge on pregnancy related danger signs and discussing the BPCR plan with the healthcare provider and the spouse

Ethics approval

Ethics clearance was obtained from the Ethics Review Committee Faculty of Medicine, Colombo. (Reference Number: EC-14-137)

Funding

This study did not use any external funds.

Acknowledgements

The authors wish to acknowledge the support given by national program manager maternal and child health, Family Health Bureau, Ministry of Health, Sri Lanka and the Board of Study in Community Medicine, Postgraduate Institute of Medicine, University of Colombo.

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