

# KNOWLEDGE, ATTITUDES AND PRACTICES (KAP) OF BIRTH PREPAREDNESS AND COMPLICATION READINESS IN RELATION TO SKILLED BIRTH ATTENDANT AMONG DELIVERED WOMEN IN SVAY RIENG PROVINCE, CAMBODIA

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## ABSTRACT:

**Background:** Birth preparedness and complication readiness (BP/CR) is the strategy to enhance timely use of skilled care in childbirth. Delivery assisted by Skilled Birth Attendant (SBA) is the single most important intervention to prevent maternal mortality. Cambodia is one of the success countries to reduce maternal mortality ratio (MMR), but further reduction is required to achieve Sustainable Development Goals (SDGs) by 2030. Since little is known about BP/CR in Cambodia, this study aimed to assess the level of knowledge, attitudes and BP/CR and the associations between knowledge, attitudes and BP/CR.

**Methods:** A community-based cross-sectional study was conducted among women who have delivered within last 12 months prior to the survey in March to April 2016 at Svay Chrum district, Svay Ring province, Cambodia. Face-to-face interviews were conducted using a structured questionnaire by the Maternal Neonatal Program of Johns Hopkins Bloomberg School of Public Health. Pearson correlation and one way ANOVA were performed.

**Results:** Among 250 respondents, 98% of women had delivery at health facility assisted by SBA while only one woman gave birth at home and four on the way to facility assisted by unskilled attendants. Almost 92% of women were classified into low level of knowledge on BP/CR. Severe vaginal bleeding was the most common danger sign, whereas saving money was the most positively associated with birth preparedness. About 70% of respondents were classified into neutral level of attitude towards BP/CR. Sixty percent of women were classified into moderate level of birth preparedness and complication readiness. Positive associations between occupation, family wealth, knowledge on danger signs, number of ANC visit, history of abortion, beneficiaries of health financing schemes and negative associations between parity and BP/CR were found. Family wealth tended to be the most important variable for BP/CR, followed by parity, knowledge on danger signs and history of abortion.

**Conclusion:** This study found low level of knowledge, neutral level of attitude and moderate level of BP/CR. Knowledge, parity and number of ANC visit were significantly related to BP/CR. There were significant differences of BP/CR between those with and without occupation, among rich and poor and those with and without poorest certificate. In order to improve knowledge on BP/CR, it is important to strengthen health education through ANC and community with special focused on the poor and those who lesser parity. Programs and policies need to be focused on poor women to fulfill the new global priority.

**Keywords:** Birth preparedness and complication readiness, Skilled birth attendant, Maternal mortality, Cambodia

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## INTRODUCTION

Obstetric complications are the leading causes of maternal death. Globally, it is estimated nearly

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830 women die every day due to preventable causes during pregnancy and childbirth and 99% of all deaths occur in low-income counties [1]. The reduction of maternal mortality has long been a global health priority and was a target of United Nation Millennium Development Goals (MDGs) until 2015 and Sustainable Development Goals (SDGs) with 70 per 100,000 live births by 2030.

Cambodia is one of the success countries to reduce Maternal Mortality Ratio (MMR). MMR in Cambodia has significantly reduced from 1,200 per 100,000 live births in 1990 to 170 per 100,000 live births in 2014 [2]. The successful reduction of MMR in Cambodia is associated with fertility declines, socio-economic and educational improvements, rapid increase in facility-based delivery and SBA, increase the number of facilities which are able to provide Basic Emergency Obstetric and Newborn Care (BEmONC), monetary incentive for midwives, and an expanding health equity funds scheme and so on. Better road condition has also contributed to considerable improvement of accessibility [3]. Receiving cares from Skilled Birth Attendant (SBA) is the single most important intervention to prevent maternal mortality.

Birth Preparedness and Complication Readiness (BP/CR) is a strategy to promote timely use of skilled maternal care during pregnancy, childbirth, or early postnatal period, especially in women with obstetric complications [4]. According to World Health Organization (WHO), BP/CR is an essential part of antenatal care including followings: desired place of birth; preferred birth attendant; location of the nearest facility for birth; funds for expenses; supplies and materials to bring to a facility; identified labor and birth companions; identified support persons to take care other children at home; identified transportation to a facility; and identified blood donor if needed [5]. In Cambodia, above components were incorporated into "Safe Motherhood Clinical Management Protocol" [6, 7]. Ministry of Health Cambodia considered birth and emergency preparedness as one of the important elements through antenatal care. Health professionals are required to develop a birth and emergency plan with pregnant women at the first antenatal visit and review it subsequent visits. Intervention to reduce the barrier to seek maternal cares must be addressed in order to reduce maternal mortality.

According to Cambodia Demographic and Health Survey (CDHS) published in 2014, the

percentage of delivery assisted by SBA and the percentage of delivery in health facilities have increased from 34 % in 2005 to 89% in 2014, and 16% to 83%, respectively [2]. In corresponding to its improvement, MMR in Cambodia has reduced dramatically in last decade. Statistically, Cambodia has made a significant progress, however estimated MMR in 2015 was still high of 161 per 100,000 live births compared to that of neighboring countries, 20 per 100,000 live births in Thailand and 54 per 100,000 live births in Vietnam [8]. WHO's six months pilot project was conducted to introduce birth preparedness in rural Cambodia, and there found increase of ANC attendance, SBA use and delivery in health facilities after intervention [9]. But little is known about current status of BP/CR in Cambodia. This study therefore aims to fill this gap to assess the knowledge, attitude and BP/CR and its associations, also to find the proportion of delivery assisted by SBA among women who have delivered within 12 months in Svay Rieng Province, Cambodia.

## METHODOLOGY

### Study design

This is the community-based cross-sectional study conducted in rural Cambodia with an ethical approval from National Ethics Committee for Health Research, Ministry of Health Cambodia (approved number 098 NECHR, approved date 15 March 2016). Participants are women who have delivered within last 12 months.

### Sample size and sampling technique

The sample size calculation was determined by using following formula;

$$n = Z^2_{1-\alpha/2} P(1 - P)/\epsilon^2$$

The total sample size was 260. Multistage sampling technique was conducted. Province, district and communes were selected by convenience sampling, where researcher had worked before. All eligible mothers who we met were selected as participants.

### Measurement tool

The questionnaire was adapted from Safe motherhood Survey questionnaire by the Maternal Neonatal Program of Johns Hopkins Bloomberg University [4]. It consists of 5 parts, (1) Socio-demographic information (2) Knowledge (3) Attitudes (4) Personal experience related to last pregnancy (5) Personal experience related to last birth,

**Table 1** Delivery of 250 women who have delivered within last 12 months

Delivery	Number	%
<b>Birth assistant</b>		
Skilled birth attendant	245	98.0
Unskilled attendant	5	2.0
<b>Place of birth</b>		
Provincial hospital in Svay Rieng	84	33.6
Referral hospital in Svay Rieng	38	15.2
Health center in Svay Rieng	114	45.6
Private clinic in Svay Rieng	1	0.4
Health facility in Phnom Penh	6	2.4
Other provinces and Thailand	2	0.8
Home	1	0.4
On the way to facility	4	1.6

according to original structure.

Obstetric danger signs were grouped under three phases of pregnancy, delivery and postpartum. These were open-ended question and only spontaneous responses were recorded. A correct answer was given “1” and “0” for incorrect answers and don’t know. Overall knowledge was evaluated from the cumulated knowledge scores both danger signs and birth preparedness and complication readiness. Overall knowledge scores were classified into three levels with Bloom’s cut off point. The attitude score was summative score derived from Likert scale responses for the hypothetical statement. Responses can range from “strongly agree”, “agree”, “neither agree or disagree”, “disagree” or “strongly disagree”. A greater value “5” was assigned to the most ideal response, “4” for reflected agreement with positive statement or disagreement with negative statement, “3” for neutral response, “2” for disagreement with positive statement or agreement with negative statement and “1” for non-ideal response. Total attitude scores were classified into three levels with cut-off point of mean  $\pm$  S.D. Five components of birth preparedness and complication readiness were categorized into “prepared” or “not prepared”. The practice scores were classified into three levels with cut-off point of mean  $\pm$  S.D.

#### Data collection

Prior to interview, one day training was provided by researcher to enumerators. The training emphasized on explaining the objective of the research, selection of participants, informed consent and interviewing methodology by using role playing. General information of target area was collected from Provincial Health Department in Svay Reing province. Then researcher visited each

village to get the information from village leader. Individual face-to-face interview to the respondents was conducted using a structured questionnaire.

#### Data analysis

Descriptive statistics were used to determine frequency, percentage, mean, median, range and standard deviation. Pearson correlation was employed to find the correlation between quantitative data and birth preparedness and complication readiness score. For qualitative data, either one way ANOVA or Kruskal Wallis tests were employed by SPSS v.22 (University license) to compare means or median of birth preparedness score by various characteristics.

#### Quality control

The quality of data was controlled using validated questionnaire, translation and pretesting of questionnaire.

## RESULTS

### The proportion of delivery

This study found that 98.0% of women delivered with skilled birth attendant in health facility. About half of respondents (45.6%) delivered at health center in Svay Rieng, followed by Provincial Hospital in Svay Rieng (33.6%). Only one woman delivered at home and four women delivered on the way to facility (Table 1).

### Characteristics of sample women

The mean age of respondents was 27.47. About half of the respondents (48.8%) were primipara. About 27.6% of women were house wives, while 72.4% had occupation. Only 50.8% of women had secondary or higher education. 51.6% of family were in fourth wealth quintile by rating scale scores from 1 to 9 points (Table 2).

**Table 2** Characteristics of 250 women who have delivered within last 12 months

Characteristics	Number	%
<b>Age (years)</b>		
Mean(SD) = 27.49(5.81)		
<20	10	4.0
20-24	81	32.4
25-29	74	29.6
30-34	51	20.4
>35	34	13.6
<b>Marital status</b>		
Married	244	97.6
Others	6	2.4
<b>Parity</b>		
1	122	48.8
2	76	30.4
3	27	10.8
4+	25	10.0
<b>Occupation</b>		
Farmer	97	38.8
Factory worker	71	28.4
House wife	69	27.6
Merchant	11	4.4
Others	2	0.8
<b>Years of school attendance (years)</b>		
None	16	6.4
1-3	31	12.4
4-6	76	30.4
7+	127	50.8
<b>Religion</b>		
Buddhist	245	98.0
Muslim	4	1.6
Christian	1	0.4
<b>Wealth quintile (rating scale*)</b>		
Lowest (<20%) (1 rating scale)	3	1.2
Second (20-39%) (2-3 rating scale)	67	26.8
Middle (40-59%) (4-5 rating scale)	50	20.0
Fourth (60-79%) (6-7 rating scale)	129	51.6
Highest (80+ %) (8-9 rating scale)	1	0.4

\*This scale scores from 1 to 9 points as follow: temporary roof (1 point), permanent roof (2), bicycle (1), motorbike (1), oxcart (1), radio (1), television (1), cow (1) and horse (1)

**Table 3** Level of knowledge of 250 women who have delivered within last 12 months

Knowledge	Low		Moderate		High	
	Number	%	Number	%	Number	%
Danger signs	232	92.8	14	5.6	4	1.6
Birth preparedness	114	45.6	97	38.8	39	15.6
Overall	231	92.4	16	6.4	3	1.2

### Level of knowledge, attitude and preparedness among sample women

Low level of knowledge on obstetric danger signs (92.8%) and low level of knowledge on birth preparedness and complication readiness (45.6%) were found in this study. Overall, 92.4% of

respondents were classified into low level of knowledge on birth preparedness and complication readiness (Table 3). Severe vaginal bleeding was the most commonly mentioned danger sign, during pregnancy (55.2%), childbirth (42.8%) and postpartum (46.8%), followed by prolonged labor

**Table 4** Knowledge of obstetric danger signs of 250 women who have delivered within last 12 months

Knowledge of danger signs	Answered correctly	
	Number	%
<b>Key danger signs during pregnancy*</b>		
Severe bleeding	138	55.2
Severe headache	15	6.0
Blurred vision	26	10.4
Swollen	81	32.4
<b>Key danger signs during delivery*</b>		
Severe bleeding	107	42.8
Prolonged labor	116	46.4
Retained placenta	46	18.4
Convulsion	26	10.4
<b>Key danger signs during postpartum*</b>		
Severe bleeding	117	46.8
High fever	46	18.4
Foul smelling vaginal discharge	10	4.0

\* Multiple responses

**Table 5** Attitude and level of birth towards birth preparedness and complication readiness of 250 women who have delivered within last 12 months

	Number	%
<b>Level of attitude</b>		
Negative (7-25)	43	17.2
Neutral (26-33)	176	70.4
Positive (34-35)	31	12.4
<b>Level of preparedness</b>		
Low (0-2)	53	21.2
Moderate (3)	149	59.6
High (4-5)	48	19.2
<b>Birth preparedness and complication readiness*</b>		
Save money	249	99.6
Identify transportation	234	93.6
Identify place of birth	201	80.4
Identify skilled birth attendant	53	21.2
Identify a blood donor	0	0

\*multiple responses

(46.4%) and swollen (32.4) (Table 4). 70.4% of respondents were classified into neutral attitudes towards birth preparedness and complication readiness (Table 5). More than half of respondents (59.6%) were classified into moderate level of birth preparedness and complication readiness. 99.6% of women saved money for delivery and emergency, 93.6% prepared transportation for delivery to health facility, 80.4% identified place of birth, 21.2% identified skilled birth attendant and no one prepared blood donor (Table 5)

#### ANC

92.8% of respondents attended ANC more than 4 times in their pregnancy. The mean  $\pm$  S.D of

number of ANC was  $7.39 \pm 2.21$ , minimum 0 and maximum 15 times (Table 6).

#### Factors related to BP/CR

Knowledge, parity and number of ANC visit were significantly related to BP/CR ( $r=0.208$ ,  $p=0.001$ ;  $r=-0.128$ ,  $p=0.043$ ;  $r=0.166$ ,  $p=0.009$ ), respectively. The more knowledge, the better BP/CR. The higher the parity, the lesser BP/CR. The more number of ANC visit, the better BP/CR (Table 7). There were significant differences of BP/CR between those with and without occupation ( $p<0.001$ ), among rich and poor family ( $p<0.001$ ) and those with and without poorest certificate ( $p=0.006$ ). Those having occupation had better

**Table 6** Antenatal care of 250 women who have delivered within last 12 months

Characteristics	Number	%
<b>Number of ANC visit</b>		
None	2	0.8
1-3	9	3.6
4-6	65	26
7-9	148	59.2
10-15	26	10.4
Mean $\pm$ S.D = 7.39 $\pm$ 2.21		
<b>Age of gestation at first ANC visit (months)</b>		
No ANC visit	2	0.8
2	193	77.2
3	42	16.8
4	8	3.2
5	3	1.2
6	2	0.8
Mean $\pm$ S.D = 2.3 $\pm$ 0.668		

**Table 7** Pearson correlation between quantitative independent variables and birth preparedness of 250 women who have delivered within last 12 months

Variables	Pearson correlation	<i>p-value</i>
Knowledge	0.208	0.001
Attitude	-0.089	0.158
Age	-0.107	0.091
Parity	- 0.128	0.043
Years of education	0.108	0.090
Number of ANC visit	0.166	0.009

**Table 8** Comparison of birth preparedness by various characteristic of 250 women who have delivered within last 12 months

	Total samples	Birth preparedness			<i>p-value</i>
		Mean	Median	SD	
<b>Occupation</b>					<0.001
Without occupation	69	2.62	3.00	0.71	
With occupation	181	3.07	3.00	0.68	
<b>Family wealth</b>					<0.001
Low (1-3)	70	2.79	3.00	0.68	
Medium (4-6)	133	2.87	3.00	0.64	
Good (7-9)	47	3.40	4.00	0.77	
<b>Distance from respondent's house to health facility (kms)</b>					0.213
<5	130	2.91	3.00	0.68	
5-9	101	3.03	3.00	0.77	
10+	19	2.79	3.00	0.63	
<b>Beneficiaries of health equity fund and vouchers *</b>					0.006
Yes	37	2.65	3.00	0.75	
No	212	3.00	3.00	0.69	
<b>History of abortion</b>					0.070
No	174	2.90	3.00	0.71	
Yes	76	3.07	3.00	0.70	
<b>History of severe health problem during pregnancy</b>					0.450
No	224	2.97	3.00	0.66	
Yes	26	2.73	3.00	1.04	

a. one way ANOVA, Kruskal Wallis Test

\*249 valid cases

BP/CR than those without occupation. Those whose family was wealthier had better BP/CR than poorer family. And those not having poorest certificate had better BP/CR than those having it (Table 8).

## DISCUSSION

### Status of knowledge, attitude and preparedness

Low level of knowledge on BP/CR was found in this study (92.4%). Low levels of knowledge of obstetric danger signs among pregnant women or delivered women were also found in other studies; central Tanzania [10], Ethiopia [11], Uganda [12], Uganda [13], Tanzania [14] and Gambia [15]. Vaginal bleeding was the most common danger sign answered correctly during pregnancy (55.2%), childbirth (42.8%) and postpartum (46.8%). This is consistent with other studies; Uganda [13], Uganda [12] and Tanzania [14]. It may be because vaginal bleeding is most visual signs to be recognized as a danger sign. Low level of knowledge can be linked to women's educational status. Only half of respondents had secondary or higher education. Positive association between education and knowledge on BP/CR was observed in other studies; Uganda [13] and Tanzania [14]. This is the fact that educated women know the importance of planning for birth and ready for complication. When women become educated, they might have better access to information from different sources. Low level of knowledge can be also explained by Khmer women's belief that postpartum bleeding was the desired situation which removes bad things out of the body [16]. "Knowledge" normally refers to scientific facts. In contrast, people's beliefs were based on traditional ideas. Sometimes it was incorrect from the biomedical perspective and obstacles to appropriate care seeking behavior [17]. In addition, delivery tend to be regarded as normal physiological phenomenon, some women had never be at risk of complications. However, every pregnancy can face any risks of complication to lead maternal mortality.

Neutral level of attitude towards BP/CR was found in this study (70%). It was found that health staffs' bad attitude influenced pregnant women's intention to use health center for delivery rather than physical and financial accessibility. Previous study in Cambodia suggested the lack of emotional support, impolite attitudes of health staff and discomfort in hospital setting were the barrier of maternal health service utilization [18]. Another study also reported that rural women did not want to

use health center because of negative attitude and absence of health staff [19]. It indicates attitude of health staff has been important factor for clients to use maternal health services in health facility. Recently, barrier of physical accessibility was much improved in Cambodia, while quality issues were still remained as a barrier of utilizing health services

Moderate level of BP/CR was found in this study (59.6%), while studies in Africa found low level of BP/CR; Ethiopia (18.3%) [20], Ethiopia (29.9%) [11], Uganda [12] and Uganda (35%) [13]. This difference can be explained by different method of evaluation on level of BP/CR. In this study, levels of BP/CR were classified by mean  $\pm$  S.D into three levels. On the other hand, study in Tanzania [10] used 3 out of 5 components, study in India [21] takes 3 steps out of 4 (identified a trained birth attendant, identified a health facility, arranged for transport, and saved money for emergency) was considered to be well-prepared. Though integrated management of pregnancy and childbirth (IMPAC) provided standard components of BP/CR [5], the number of components accounted for were actually different from each study. Differences in findings may also be explained by subject characteristic, whether they were pregnant women or mothers who had delivery. Pregnant women may report less number of key components because some pregnant women have not faced any needs for preparation. Also classification of practice level was different in each study.

Saved money was the most common element of BP/CR by majority of respondents (99.6%). This finding was similar to studies conducted in Uganda (91%) [13] and Burkina Faso (83.3%) [22]. This can be explained women and her family understand they need money for delivery and in case of emergency. On the other hand, no one identified blood donors in this study. This is similar finding to the study in Ethiopia (3%) [20]. This may be because blood transfusion is a critical condition and blood preparation is hospital matter. Provincial hospital is the only hospital in Svay Rieng province where can manage blood transfusion.

### Factors related to BP/CR

There found significant associations between parity, occupation, family wealth, knowledge on danger signs, beneficiaries of health financing schemes, number of ANC visit with BP/CR in this study.

Those who were lesser parity had better BP/CR. This may be because those who are higher age and

parity have more experiences on pregnancy and delivery, while those who are the first pregnancy have not experienced delivery yet. Primipara may have higher risk perception than multipara. This indicated that increasing risk perception among primipara might help to improve BP/CR. The significant association between parity and BP/CR was found in Ethiopia [20] and South Ethiopia [23].

Those who have occupation had better BP/CR than those who without occupation. About 28% of respondents worked as factory workers. Exposure by information from company and coworkers may give positive influence to pregnant women on BP/CR. Women who earn own money were more likely independent than housewife.

Wealthier families had better BP/CR. One of key components of BP/CR is saving money in case of emergency. Family has to pay not only for user fee but also gratuities, medication, transportation, food for all companions and so on. It is obvious that these expenses are affordable for richer families than poorer families. Some studies indicated there existed inequity of utilizing maternal health services by wealth quintile [24-26]. Family wealth is one of the important determinants of maternal health service utilization so as to birth preparedness and complication readiness especially in low-income countries.

Those not having poorest certificate had better BP/CR. This can be linked to above mentioned family wealth that wealthier families were better-off. Cambodian government has been committed to address health inequities with a specific focus on maternal and newborn health. Health Equity Fund and vouchers were introduced to promote for the poor to access health services by user fee exemptions.

Women who had better knowledge on danger signs had better BP/CR. Knowing obstetric danger signs may encourage women to be prepared for birth because they know what they had to prepare and what they had to do in case of emergency. The association between knowledge on danger signs and BP/CR were statistically significant within the studies; Ethiopia [20], central Tanzania [10], Uganda [12], and Ethiopia [11]. On the other hand, there was no clear association between knowledge on danger signs and BP/CR within the study conducted in Uganda [13], India [21] and North Ethiopia [27]. This contradictory finding implied that women might prepare some components of BP/CR without having any knowledge and its

rationale. Where BP/CR was not knowledge based planning actions but actions in the nature of things, their preparedness could not be ensured under the knowledge gap.

The important finding of this study was women who attended ANC more frequently were well birth prepared than those who less attended. Early and frequent ANC visits are the opportunity for pregnant women to receive health related information. Cambodia has achieved great increase of coverage of ANC in last decade. Finding from this study showed about 93% of respondents attended four or more times of ANC, which was WHO minimum recommendation. The primary objective of ANC is to provide health information during pregnancy. Health education allows women to be more knowledgeable on obstetric danger signs and BP/CR. ANC visits could be pre-experiences of delivery with skilled attendant for pregnant women. Pregnant women could estimate the time to the facility with a specific mode of transport, judge quality of services and identify place of birth based on her experiences of ANC visits. The significant association between number of ANC visit and BP/CR was found in other studies; in Ethiopia [20], north Ethiopia [27], India [21], South Ethiopia [23], central Tanzania [10] and Ethiopia [11]. But this is inconsistent with study in Tanzania [14]. This result is linked to the finding of this study that although about 93% of women had four or more times of ANC visits, almost 93% of women was classified into low level of knowledge on BP/CR. These contradictory findings may give us the question on the impact of ANC. It is most possibly to say that birth preparedness and complication readiness were not explained effectively during ANC. Recent Cochrane review of antenatal education [28] concluded that effectiveness of antenatal education on childbirth remained largely unknown. The study in Gambia [15] reported that even though women attend ANC many times, they were not benefiting from effective information and communication with health staff with few minutes consultation.

#### LIMITATION

This study had several limitations. It would be hard to generalize the findings of this study to provincial level nor national level because sample size was not large enough. Cluster collection factor was not used in the sample size calculation formula. Also convenience sampling was conducted because of time and budget limitations and because there

were no completed and updated delivery lists per village. Recall bias was attempted to be minimized by selecting already delivered women, women who delivered within last 12 months were included as samples because of limited data collection period. Leading questions by enumerators were sometimes observed at the field, although researcher had conducted one day training before data collection.

## CONCLUSION

Recognizing obstetric danger signs are the key factor for seeking maternal health care, but knowledge level on BP/CR among respondents was remained very low. In order to improve knowledge on BP/CR, it is important to strengthen health education through ANC and community with special focused on the poor and those who lesser parity. Increasing knowledge alone would not improve care seeking behavior, it is closely related to structural, geographical and cultural factors [29] and especially financial factors. Addressing health inequities by family wealth need to be considered in line to new global priority.

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