"Awareness and Practice of Birth Preparedness and Complications Readiness among Pregnant Women in the Covid-19 era In Fako Division, Cameroon"

Abstract

Background: Birth Preparedness and Complication Readiness is a strategy to enhance the timely use of skilled maternal and neonatal care, especially during childbirth, based on the theory that preparing for childbirth and being ready for complications reduces delays in obtaining this care and reducing associated pregnancy risk. One target under sustainable Development Goal 3 is to reduce the global maternal mortality ratio to less than 70 per 100,000 births, with no country having a maternal mortality rate of more than twice the global average. So there is a need to identify ways to reduce maternal mortality which is a top priority in development of the management of pregnant women and invention. **Write Same font and size**

Objective: of this study was to investigate the awareness and practice of birth preparedness and complication readiness among pregnant women in the Buea Health District.

Methods: This was a community -based cross sectional study carried out in the Buea Health District of the South West Region, Cameroon. 163 pregnant women of ≥28 weeks gestational ages seen at the antenatal consultation units were selected using convenient sampling method. Data collected was analysed with SPSS version 25.0 and Microsoft excel 2010.

Results: Of the 163 pregnant women included in this study, 129 (79.1%) were aware of birth preparedness and complication readiness. 136 (83.4%) had knowledge in recognising danger signs in pregnancy and Vaginal bleeding was the most frequent mentioned danger sign (72.4%). 80(49.1%) had excellent knowledge on danger signs, 59(36.2%) had good knowledge while 24(14.7%) had poor knowledge on key danger sign in pregnancy. The practice of birth preparedness and complication readiness, 47.9% had optimal practice, 37.4% had standard practice while 14.7% had poor practice.

Conclusion: The awareness of birth preparedness and complication readiness was high.

Keywords: Awareness, Birth preparedness and complication readiness, Pregnant women,Health district, Cameroon

1. BACKGROUND

The principle and practice of birth preparedness and complication readiness (BPCR) in a third world setting where there is prevailing illiteracy, inefficient infrastructure, poor transport system, and unpredictable access to skilled care provider have the potential of reducing the existing high maternal and neonatal morbidity and mortality rates. BPCR promotes skilled care for all births and encourages decision making before the onset of labour [1]. The BPCR matrix raises awareness of danger signs, thereby improving problem recognition and reducing delay in deciding to seek care [2]. Maternal mortality which is still a major public health problem although globally there has been a decrease [3]. Unfortunately, Cameroon has its maternal mortality ratio (MMR) increased from 430 per 100 000 live births in 1991 to 782 in 2011 [4]. Birth preparedness and complication readiness (BPCR) among other strategies developed by the safe motherhood programme of the United Nations was recognized as a key component in the reduction of maternal and neonatal mortality [5].

Birth preparedness and complication readiness is a comprehensive package to promote timely access to skilled maternal health services. It permits pregnant women and their families seek health care without delay in case of obstetric complications and delivery [5, 6]. BPCR is an essential component of the focused antenatal consultation (FANC) adopted in Cameroon by the Ministry of Public Health to combat the two main delays out of three that are known to be associated with most maternal deaths [7]. It is evident that most of the complications that lead to maternal deaths if treated on time will greatly reduce maternal mortality. The aim of BPCR is to permit pregnant women and their families to overcome the delays that often lead to fatal outcomes due to absence of timely care [5]. BPCR consists of the pregnant woman and her family making active preparation and decision making on identifying a health facility

and a skilled birth attendant, saving funds for delivery, emergency and transportation, arranging for mode of transportation, identifying compatible blood donors, arranging necessary article, identifying birth companion and having knowledge on danger signs [4, 5]. Birth preparedness and complication readiness, a strategy to fight this dilemma of maternal and neonatal mortality, is yet to gain its root as a pillar of the focused antenatal consultation. Therefore, the objective of this study is to provide analysis on the awareness and practice of BPCR among pregnant women in the Buea Health District (BHD). The results of this study can provide suggestions which may be beneficial in the reduction of maternal morbidity and mortality.

2. MATERIALS AND METHOD

2.1. Study setting

Buea is found in Fako Division in the South West Region of Cameroon. It covers a total surface area of 870 square km. It has an equatorial climate, and temperatures range between 20-28 °C [8]. The town experiences two major seasons; a rainy season that begins in March and ends in October, and a dry season that begins in November and ends in February. Annual rainfall varies from 3000 to 5000 mm. This health district has about 133,092 inhabitant distributed within 66 communities across selected health areas, namely; Molyko, Muea, Buea Town, Bova, Bokwaongo, Tole and Buea Road health areas. The hospitals within this health district are very accessible to patients and offer consultations, laboratory and pharmacy (for essential drugs) services to the population on regular basis.

2.2. Study design

This was a hospital based cross-sectional study conducted in the Buea Health District (BHD) of the South West Region of Cameroon from January to July 2020

2.3. Study population

The target population was all pregnant women who were at 28 weeks' gestation and above and attending ANC at chosen health facilities in the Buea Health District, namely, Regional Hospital Buea, Muea Integrated Health Center, Buea Town Integrated Health Centre, Molyko Integrated Health Center, Bokwango Integrated Health Center, Solidarity Hospital Molyko-Buea The health facilities were selected based on the number of pregnant women attending ANC and also on the accessibility of the health facility.

2.4 Sampling technique

A purposive sampling technique was use to select the health centres and hospitals

2.4. Sampling methods

A convenience sampling was employed to select the study population. Therefore, any pregnant woman who was eligible and willing to participate was included. The sample size was obtained using the Lorenz's formula.

Sample size, $n = (z^2pq)/d^2$ **(1)**

Where, q = 1-p

Z = standard normal variate, 1.96

P = expected proportion in population base on previous studies (prevalence). The prevalence of 12% was used in this study which was obtained from a study conducted *by Jesmin et al* in 2018 on the "Level and determinants of birth preparedness and complication readiness among pregnant women: A cross sectional study in a rural area in Bangladesh"

D = absolute error or precision, 5%

⇨ **$n = [(1.96)^2 * 0.12 * 0.88]/(0.05)^2 = 162$**

From the above formula, the sample size is 162. But for the purpose of this study, the sample size will be 163 pregnant women.

Criteria for inclusion

- Pregnant Women Willing and able to give informed consent.
- Pregnant Women ≥ 28 weeks of pregnancy and attending ANC at the chosen health facilities.

Criteria for exclusion

- Women attending ANC visit for the first time.
- Women at ≥ 28 weeks who attend ANC but were absent at the time of collection
- Pregnant Women who were sick at the time of data collection **can be combined in one**

2.7. Data collection tools/technique

The tools for data collection was a structured questionnaire filled by the respondent.

The questionnaire used in this study was a modified version of one developed by *Yunga et al, 2019* which aimed to assess awareness and practice of birth preparedness and complication readiness among pregnant women in the Bamenda health district, Cameroon. For the purpose of this study, some modifications were made e.g. employer of mother, income level, highest level of education, gravidity, danger sign like high fever, swollen leg/face, retained placenta etc. to the design as adopted from the survey tools developed by JHPIEGO (Johns Hopkins Program for International Education in Gynecology and Obstetrics) Maternal Neonatal Health program. A pre-test of the questionnaire was done at the Buea Regional Hospital to ensure its feasibility and to respond to the objectives of the study and any ambiguity was modified based on pre-test findings. Some of the correction made was the terminology like gravidity were modified to the understanding of the respondents. The technique of the data collection was through a self-administered questionnaire with the participant to elicit responses if eligibility for the study were met within the period of data collection. Women who were unable to read and write were assisted by the investigator to fill their questionnaire. The questionnaire included questions on; Birth preparedness and complication readiness (BPCR). The questionnaire was made up of three sections: Section

one which was on the socio-demographic and reproductive health data of the woman, was made of fourteen questions for participants to tick the right option. This section includes questions like the age, marital status, employer of mother, religion, level of education, parity and gravidity status, socioeconomic status. The parity and gravidity status was analyzed and indexed into primiparae, secundiparae and multiparae. Income level was indexed into upper class, middle class and lower class. Section two was to assess the awareness on BPCR. It is made up of seven questions for the woman to select her best option(s). Section three of the questionnaire was based on the practice of BPCR and made up of four questions. It included questions as to whether or not the mother has planned for deliveries and/or emergency complications. Although the original questionnaires were in English language, Pidgin English was used for those who could not understand English

All the information was recorded anonymously and confidentiality was assured throughout the study.

2.8. Study procedure

After signing an informed consent form, participants were administered a survey questionnaire.

2.9. Data processing and analysis

For analysis to be gotten a careful systematic procedure was carried out with the use of the responses from the questionnaires and information gotten was categorized from each section of the questionnaire starting with the demographic information followed by awareness, knowledge, practice and factors. Data collected from the hardcopy of the questionnaire, was inputted into ***open data kit collect*** (Android phone application for data inputting) for security and to make it electronic in the field. The form was an image of the questionnaire created by the Lifafa Research foundation. Data management was with Microsoft Excel and analysis was done using statistical package for the social sciences (SPSS) version 25.0 and EPI info version 7.0 (CDC, 2007). P-value less than 0.05 was consider to be statistically signifant ($p<.05$)

Birth preparedness and complication readiness (BPCR): The prevalence of awareness and practice of BPCR were determined from simple frequency distribution. Those who ticked all the correct answers as they appear in the questionnaire and were prepared with the knowledge and physical abilities were classified as "fully aware and well prepared" those who were "aware and not prepared" were those who have heard of BPCR but did not take any step in preparation, those that were "slightly aware" were those who did not had all the fact as in this section of the questionnaire while those who were "unaware" were those who have no knowledge about BPCR plan.

Knowledge of danger signs in pregnancy: Assessment of knowledge on maternal danger signs during pregnancy was done based on a list of thirteen danger signs. In this study, women who reported spontaneously at least five out of the thirteen danger signs were considered to have "*excellent knowledge*" while those who gave at least three out of the thirteen danger signs, were considered to have "*good knowledge*", and those who reported less than three out of the thirteen danger signs er had "*poor knowledge*".

Practice of BPCR: A total of eight parameters were listed and any woman who carried out all the required and correct steps in chronological order as expected effectively, were considered to have "*optimal practice*", those who did not carry out at least one steps were considered to have "*standard practice*" and those who did not carry out any steps were consider to have "*poor practice."*

All these data were analyzed, printed on hardcopy and kept safe in a clean dry cupboard and accessibility was restricted from all except the investigator. The softcopy were converted to pdf (Portable Document Format) files, stored in a folder in a laptop and backup in a universal serial Bus (USB) flash and electronic mail (E-mail.) for proper protection for retrieval when needed.

3. RESULTS

A total of 163 questionnaires were printed and administered (100% distribution) and all the 163 questionnaires were received (100% response rate).

3.1. Socio-demographic and reproductive health data

A total of 163 pregnant women were included in this study. They comprised of pregnant women with gestational age ≥ 28 weeks. The modal age range was 20 – 29 years with the least age being 16 years and the most 44 years. Out of the 163 pregnant women, a majority of the women have had university education 78(47.9%). (Table 1)

Table 1: Socio-demographic and reproductive health characteristics of the respondents

parameters	Distribution	Frequency (n= 163)	Percentage (%)
Age	13-19 years	16	9.8
	20-29 years	104	63.8
	30-39 years	39	23.9
	≥40 years	4	2.5
Level Of Education	none	6	3.7
	primary	16	9.8
	secondary	63	38.7
	university	78	47.9
Marital Status	concubine	7	4.3
	married	98	60.1
	single	58	35.6
Income Level	lower class	92	56.4
	middle class	44	27.0

	upper class	27	16.6
Number Of ANC Visits	1-3	101	60.1
	4-6	63	38.6
	>6	2	1.2
Occupational status	housewife	39	23.9
	private service	38	23.3
	public service	20	12.3
	self-employed	66	40.5
gravidity	multiparae	52	31.9
	primiparae	73	44.8
	secundiparae	38	23.3
religion	christian	155	95.1
	muslim	8	4.9

3.2. Awareness on birth preparedness and complication readiness

Of the 163 participants in this study, 129 (79.1%) accepted to have heard of birth preparedness plan while the rest of the women did not. Even though, 79.1% acknowledged to have heard of the term birth preparedness plan, 95(58.3%) acknowledged to have received some kind of information on preparations to be made during pregnancy from the health workers. (table. 2).

Table 2: Information provided by health workers on birth preparedness and complication readiness among pregnant women in the BHD

	Response (n=163)	
ADVICE FROM HEALTH PERSONNEL	**Yes**	
	Frequency	**percentage**
Danger signs in pregnancy	136	83.4
Where to go in case of serious health problem	106	65.0
Where you should give birth to your baby	74	45.4
Arrangements for funds	72	44.2
Arrangements for transportation	48	29.4
Arrangements for Blood donors	52	31.9
Arrangement for the Heath worker to deliver your child	45	27.6
Signs of labour	108	66.3
Others (Back pains, Drink enough water, eat fruit and vegetables, How to lie when having contractions and No wearing of high	4	2.5

heels)

The results could be analyzed as follows: 70(42.9%) were fully aware and well prepared, 35 (21.5%) were aware and not prepared, 24(14.7%) of the women were slightly aware while 34 (20.9%) were unaware (fig. 1)

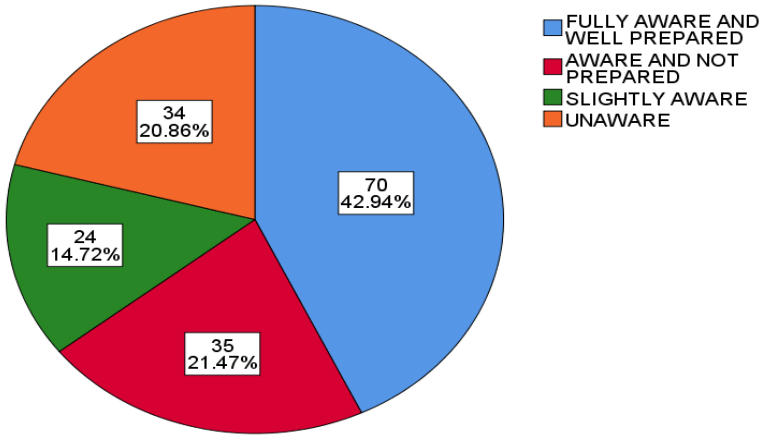

Figure 1: *distribution of the proportion of awareness of birth preparedness and complication readiness among pregnant women in the BHD*

3.3. Knowledge in recognizing dangers signs in pregnancy

The pregnant women were questioned on whether they knew any danger signs of pregnancy. Of the 163 women, 136 (83.4%) has received advise on danger signs in pregnancy. Regarding the knowledge of dangers signs, vaginal bleeding was the most frequent mentioned danger sign (72.4%), (Table 3). .

Table 3: Respondents' knowledge of danger signs in pregnancy with association in level of education

DANGER SIGNS	response (n=163)		p-value	
	Yes			
	frequency	percentage	Age	Level of education
Severe Vaginal Bleeding	118	72.4		.000
Swollen Hands/Face/Feet	73	44.8	.032	
Convulsion	41	25.2		
High Fever	91	55.8		
Difficulty Breathing	57	35.0		
Severe Abdominal Pain	107	65.6		
Blurred Vision	38	23.3		
Severe Weakness	72	44.2		
Severe Headaches	51	31.3		
Absence Of Foetal Movement	98	60.1		
Loss Of Consciousness	50	30.7		
Amniotic Fluid Leaks	79	48.5		
Retained Placenta	60	36.8		
Other	9	5.5		

With respect to these results, 80(49.1%) had excellent knowledge on danger signs, 59(36.2%) had good knowledge while 24(14.7%) had poor knowledge on key danger sign in pregnancy (Fig. 2)

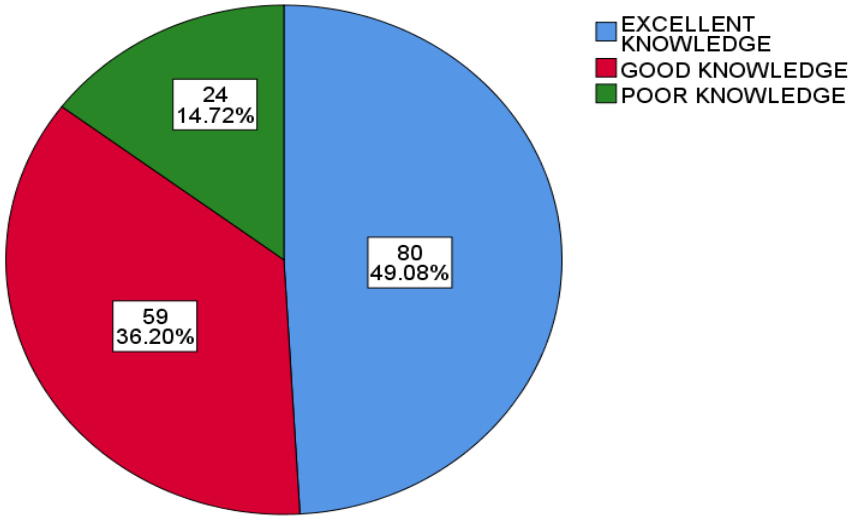

Figure 2: *Respondents' knowledge of danger signs in pregnancy*

3.4. Practice of birth preparedness and complication readiness

In the practice of BPCR, the most common practice was had saved money/kept money aside for incurring cost of delivery and obstetric emergencies (81.6%), (table 4.).

Table 4: preparation made my pregnant women in the BHD in association with demography

Preparations made during Pregnancy	responses (n=163)	
	Yes	
	frequency	Percentage
Saved money for birth/complications	133	81.6
Identified mode of transport	49	30.1
Identified blood donors	38	23.3
Identified health facility	99	60.7
Identified skilled health provider	48	29.4
Identified birth companion	75	46.0
Identified decision-maker	58	35.6
Packed necessary items for birth	114	69.9
other	1	0.6

According to the results obtained, 47.9% had optimal practice, 37.4% had standard practice while 14.7% had poor practice. (Fig. 3)

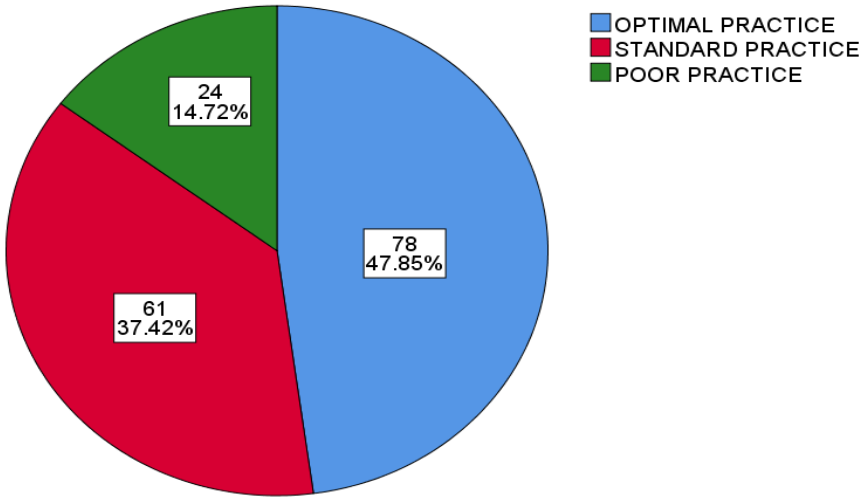

Figure 3: *proportion of practice of birth preparedness and complication readiness among pregnant women in the BHD.*

3.5. Factors hindering practice of BPCR amongst pregnant women in BHD

The factors found to hinder the practice of BPCR among pregnant women in the BHD were financial difficulties 87(53.37%), indecisiveness 46(28.22%), lack of quality information 13(7.98%) and ignorance 17(10.43%), (fig.4).

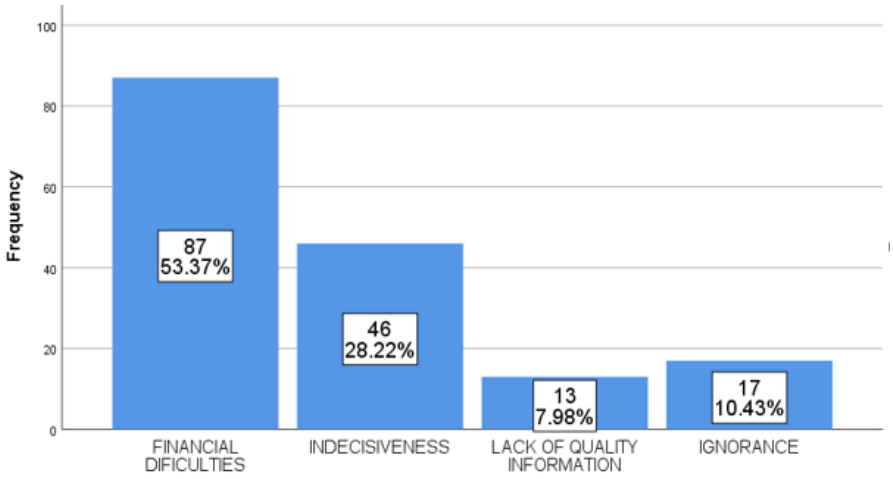

Figure 4*: factors hindering practice of BPCR among pregnant women in the BHD*

4. DISCUSSIONS.

Awareness on birth preparedness and complication readiness

Awareness of BPCR was found to be 79.1% (129 respondents). Which was similar to 78.6% in Faculty of Medicine Vajira Hospital, Thailand [13] but higher than the 46.1% of the Bamenda Health District (BHD) of the North West Region of Cameroon [9]. The difference in awareness between this study and that in Bamenda may be as a result of better orientation done as time elapses. The main source of information on birth preparedness was provided by health professionals (64.9%) similar to studies in Southern Ethiopia [14]. Few women (58.3%) acknowledged to have been provided with some information on preparations to be done, less than 89.3% reported in Bamenda Health District (BHD) of the North West Region of Cameroon [9]. This difference may be due to limited information provided to pregnant women during ANC or the information was not provided on every visit by Health personal in the BHD. Information provided by health personnls includes; where to go in case of health problem or birth, arrangements of funds, arrangements of transportation, informed on the need to identify blood donors. The results obtained were higher compared to those in south west Ethiopia and Bangladesh [15, 16] but lower than that of Bamenda [9]. The mean value for information received by pregnant women from health providers was at 64.9% which confirms that the awareness of the components of BPCR is low. The difference with findings may have to do with the difference in the study time and advantages of improved service delivery, also

information provided to the women by health personnel. The discrepancy may also be due to high level of education with pregnant women in the BHD. From literature, an increase in the average income of an individual has a positive influence on the likelihood of preparing for birth and its complications.

Knowledge in recognizing danger signs in pregnancy

The proportion of women (83.4%) who had received information on danger signs were similar to 83.78% of the Antenatal Clinic, Hospital University Sains Malaysia [17] and higher than the 29.0% of pregnant women attending outpatient clinic of a tertiary care hospital also the 17.5% of Bangladesh and the 65.2% of Arbaminch town of Ethiopia [18,16,19]. The finding of this study was lower than 87.5% in Bamenda in the North West Region of Cameroon [9]. This difference may be due to the fact that the city administration, regional health bureau, stake holders, health professionals were working together and implemented relevant strategies to improve the access and utilization of the health care information in order to minimize maternal mortality rate. The most commonly known pregnancy danger sign as reported by the participants was severe vaginal bleeding which is in line with a study of 2015 in Ethiopia, 2019 in Bamenda-Cameroon, and 2018 in Eastern Ethiopia, [9,39,20,] but this result was higher than that of 2018 in Bangladesh, 2015 in Malaysia and 2016 in south west Ethiopia [16,15]. This difference in the most prominent danger sign may be due to socio-cultural difference among participant in other studies. The difference may also be as a results of the sample size; the sample size of this study was 163 pregnant women which was smaller compare to 2262 women of Bangladesh and 392 women of the study in south west Ethiopia.

In this study, it can be seen that, there is an association between age and knowledge in recognising danger sign in pregnancy. In this study, the most commonly danger sign associated with age are swollen face/feet and convulsion ($p = .032$) which is statistically significant ($p<.05$). The level of education is also associated with pregnancy danger sign ($p = .000$) which is statistically significant ($p<.05$). The findings of this study shows that the

pregnant women were knowledgeable in recognising danger signs in pregnancy since 85.3% of the participants knew at least three out of the thirteen danger signs in pregnancy.

Practice of birth preparedness and complication readiness

In the practice of BPCR, (81.6%) had saved money/kept money aside for incurring cost of delivery and obstetric emergencies which was the most reported practice among the women in the BHD. The findings in this study is in accordance with the 83.2% in Bamenda- Cameroon [9] but higher than that of south west Ethiopia, Bangladesh, Enugu- Nigeria and Thailand, [15, 16, 21, 22]. The findings may be due to difference in income level. The income level of women in the BHD may be higher than that of pregnant women in south west Ethiopia, Bangladesh, Enugu- Nigeria and Thailand which makes them able to make available funds in case of any emergency or complication. An increase in the average income of an individual has a positive influence on the likelihood of preparing for birth and its complications. Also, most of the women were of university level (47.9%), Women who attend primary secondary or tertiary education are more likely to be prepared as compared to women who did not attend any formal education, [23]. In this study, it can be seen that the level of education is associated with the practice of birth preparedness (identified mode of transportation, $p = .031$) and (Identified blood donors, $p = .044$) which are statistically significant ($p < .05$). The results also shows the association between income level and blood donor ($p = .026$) which is statistically significant ($p < .05$)

Factors hindering practice of BPCR amongst pregnant women in BHD

In this study, financial difficulties (53.37%), indecisiveness (28.22%), lack of quality information (7.98%) and ignorance (10.43%) were the most prominent factors that hinder the practice of BPCR among pregnant women in the BHD. This finding is in agreement with the study of 2017 in Enugu state in Nigeria and 2018 in Delta state Nigeria [21,24] but different from that of 2015 in eastern Nepal, 2018 in Kenya and of 2014 in Southern Ethiopia [25,26,27]. This difference may be explained by the low socio-economic status, low level of

knowledge and low education among women in the BHD as well as the general population. As birth preparedness and complication readiness is relatively a recent strategy, service providers and program planers may not have given special attention[28]. Also, the high poverty level is likely to affect birth preparation since part of the preparation includes setting aside finances in case of emergency. These could be due to the fact that the economic status (56.4% lower class) of the participants did not give them the ability to plan for birth and its associated complications. Furthermore, the proportion of the women who have had either primary or secondary or university level in the BHD maybe lower compare to the other studies which may hinder them to obtain information that can help them to make decisions independently. Also Little or no information provided to pregnant women during ANC visits makes it difficult for pregnant women to practice BPCR. Some women received information from wrong sources like relatives and friends, or maybe the source in question may tell them from past experience. Some women were also ignorant of the fact that the practice of BPCR is an integral part in the course of pregnancy thus this make them ignore or neglects' this practice.

CONCLUSION

The findings of the study revealed that the awareness of birth preparedness and complication readiness was high. Few of the pregnant women did not make preparations as required by the BPCR plan. Insufficient information provided by the health personnel and absence of community health workers and mass media in the communication of the message on awareness and practice of birth preparedness and complication readiness could be attributed to the low status of birth preparedness and complication readiness among pregnant women in this health district. The findings also indicate that the knowledge on danger signs in pregnancy among pregnant women in the BHD are high. Women's knowledge of danger signs during pregnancy positively influenced their decisions regarding when to seek medical care and when to take appropriate action. The practice of BPCR were high. Financial

difficulties, indecisiveness, lack of quality information and ignorance were the factors associated with the practice of birth preparedness and complication readiness. **Grammer can be improved little**

RECOMMENDATION

To the problems identified in this study, the following proposed suggestions have been made:

- Availability and distribution of the delivery plan leaflet to all pregnant women or the plan should be Included in the ANC card.
- Birth preparation plans and danger sign in pregnancy should be discussed with all pregnant women at every ANC visit.
- Mass media, especially the radio and television, should be exploited in the transmission of the Message on BPCR plan.
- Further research should be carryout in other part of the South West region and the Cameroon as a whole in order to be able to make a definitive conclusion.

LIMITATIONS

Women who participated in the study were recruited via convenience sampling and were restricted to those who attended antenatal clinic in selected hospitals/health centers in the BHD at the time data collection. Thus, the results are difficult to generalize to all antenatal women residing in this health district, or those in other part of the country.

Suggestion for further study

A qualitative study to understand why the sufficient preparations are not made can be done in this Health District

Abbreviations

BPCR: Birth Preparedness and Complication Readiness, SBAs: Skilled Birth Attendants MMR: Maternal Mortality Ratio, FANC: Focused Antenatal Consultation , ANC: Antenatal Consultation, NMR: Neonatal Mortality Rate, SPSS: Statistical Package for the Social

Sciences, UTI: Urinary Tract Infection, HCP: Health Care Provider, STIs: Sexually Transmitted Infections, HIV: Human Immunodeficiency Virus, APA: American Pregnancy Association, TB: Tuberculosis

Ethical Approval and Consent for Participation: Administrative authorization was obtained from the South West Regional Delegation of Public Health (Ref: 211/MINSANTE/SW/RDPH/PS/936/896). Written consent was obtained from all the participants.

Authors Contribution

TPB,AFE conceived and designed the study: AFE and TPB implemented the study: GIK supervised the study: NFA and MI conducted data analysis: AFE, , TPB, GIK ,NFA,WJK inter-preted study results: TPB , AFE wrote the first draft of the manuscript, DDY,TPB, NFA, GIK and WJK reviewed and corrected the manuscript. All authors approved the final copy.

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