

Factors Influencing Birth Preparedness in Rural Area: A Systematic Literature Review

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Abstract— Maternal Mortality Rate (MMR) in developing countries is currently the highest in the world. Birth Preparedness and Complications Readiness/BPCR) is one of the main key interventions to reduce maternal mortality and achieve the Sustainable Development Goals (SDG's) targets that have been implemented in various countries. The purpose of this study was to describe the factors influencing Birth Preparedness and Complication Readiness (BPCR) in rural areas. This study conducted a systematic review following the PRISMA statement and collected individual research studies from databases such as CINAHL/Ebscohost, PubMed, Web of Science, and Embase. This *Systematic Literature Review* (SLR) of surveyed among pregnant women, this survey on pregnant women describes knowledge about childbirth readiness from each indicator, that either includes saving money as much as 46.8 % -88 %, identified mode of transportation 18 % -76.3 %, skilled provider 15.7 % -100 %, place of birth 44.3 % -85.8 %, and blood donor 0.89 % -29.6 %. Furthermore, the awareness of Complication Readiness ranged from 14.3 % to 82.4 %. Meanwhile, the BPCR practice rate is 32.78 % -61.8 %, indicating that it is well prepared. Furthermore, the most prevalent characteristics that impact BPCR practice are parity, Ante Natal Care (ANC) visits, knowledge of BPCR, mother's education, mother's occupation, and gestational age.

Keywords: Birth preparedness, Complication readiness, Systematic Review, Rural area

Introduction

Globally, maternal mortality is a major public health problem, as 800 women die every day due to pregnancy or complications during childbirth. Every pregnant woman faces the risk of obstetric complications that are unpredictable, and life-threatening and can end in death, especially in developing countries. This maternal mortality rate can be prevented if every pregnant woman has good delivery readiness and every woman who experiences complications has access to appropriate health services. [1]

The World Health Organization (WHO) (2016) states that the Maternal Mortality Rate (MMR) in developing countries is currently the highest in the world, which is around 415/100,000 live births (KH). This figure is 40 times higher than the MMR of European countries and almost 60 times higher than that of advanced/wealth countries. WHO estimates that half a million women die each year due to pregnancy and 99% of these deaths occur in developing countries.[2-4] Approximately 75% of maternal deaths are due to direct obstetric complications, including bleeding 27%, hypertension 14%, sepsis 11%, abortion 8%, embolism 3% and other direct causes.[5-7]

The Maternal Mortality Rate (MMR) in Indonesia is still the highest in Southeast Asia, based on data from the 2015 Intercensus Population Survey (SUPAS) showing an MMR of 305 per 100,000 live births. The Sustainable Development Goals (SDG's) target to reduce the MMR to less than 70 per 100,000 live births by 2030. [8]

The main strategy that can reduce the number of women who die due to pregnancy complications is to prepare a delivery plan and prepare for complications for pregnant women, their partners and their families.[9] Birth Preparedness and Complications Readiness/BPCR) is one of the main key interventions to reduce maternal mortality and achieve the SDG's targets that have been implemented in various countries. [6, 10]

Previous studies in developing countries found that Birth Preparedness intervention was associated with a statistically significant 18% reduction in the risk of neonatal death and a 53% reduction in the risk of maternal death. On the other hand, families who do not prepare for birth take a long time to identify problems, prepare transportation and reach appropriate referral facilities, causing delays, especially delays in making decisions at the family level.[1]

The results of a study in South Sudan providing health education about Birth Preparedness were significantly able to increase deliveries in health workers. Birth Preparedness education significantly increased deliveries by skilled health workers (PR, 2.64; 95% CI, 1.91–3.66).[11]

Some of the indirect causes of maternal mortality in Indonesia include community conditions such as education, socioeconomics, culture, geographical conditions and the unprepared state of service facilities contributed to this problem. One of the contributions to maternal mortality is also caused by the phenomenon of being too late, namely being too late to recognize danger signs and making decisions at the family level, arriving late at the health service and being late in getting adequate help. Delays in recognizing danger signs and making decisions at the family level can be avoided if the mother and family know the danger signs of pregnancy and childbirth and the actions that need to be taken to overcome them at the family level.[12]

The first delay in Indonesia is often influenced by the delay in recognizing danger signs and making decisions on the part of the family. Recognition of danger signs by health workers also affects the timeliness of referring decisions, delays in making decisions and delays in referring are more influenced by factors that exist in the community. The second delay is often influenced by cost and transportation barriers, causing delays in obtaining health services. Not all people in Indonesia take advantage of the National Health Insurance (JKN) program. The third delay is related to the slow service of health workers in service facilities in handling referral cases[12]

Birth Preparedness and Complication Readiness (BPCR) is a programmed and planned approach to increase the use of health services for pregnant women in preparing for birth to reduce the three late causes of maternal death, especially delays in decision making at the family level. [1]

The purpose of this study was to describe the factors influencing Birth Preparedness and Complication Readiness (BPCR) in rural areas.

Method

This research is conducted using a Systematic Literature Review, which consists of 2 main points: eligibility criteria and search strategy.

Eligibility criteria

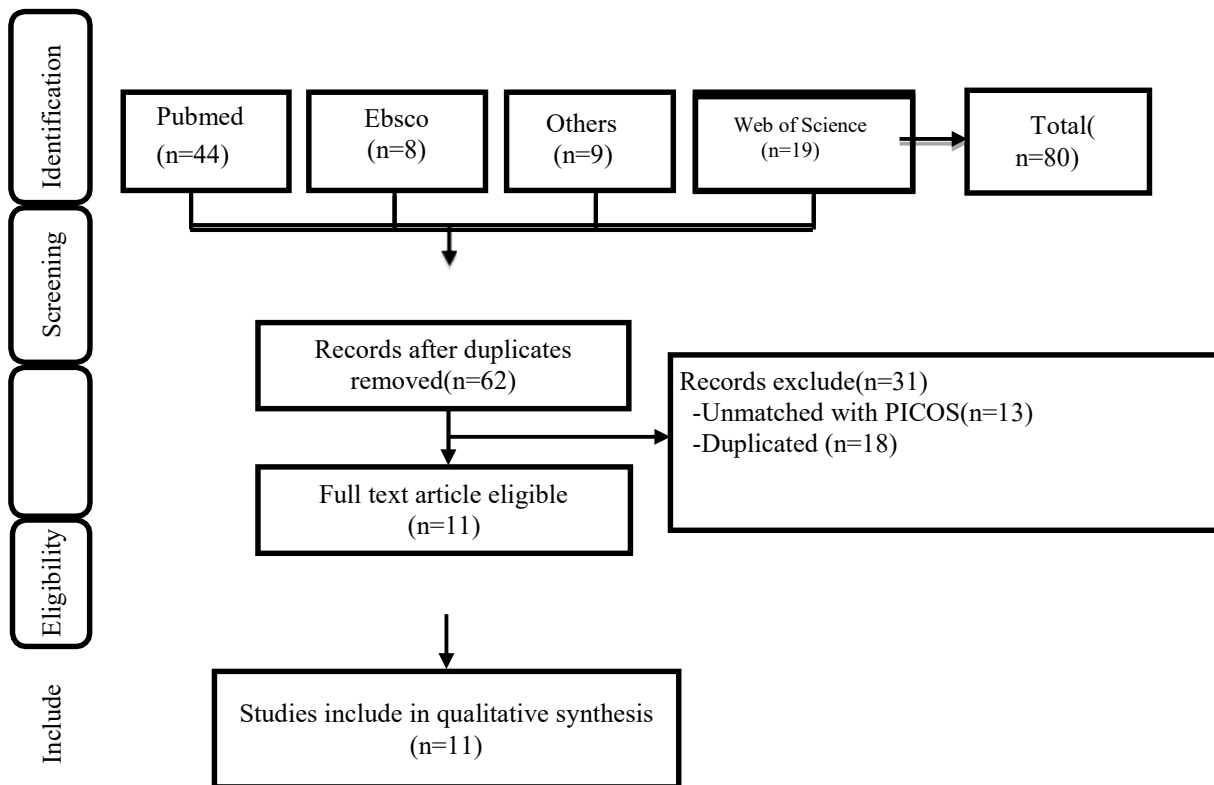
This eligibility of the study included a) academic journals from an online database such as Pubmed, CINAHL/Ebscohost, Web of Science, and another search engine (Google scholar), b) Published year between 2011-2021, c) Language in English, d) Outcome measurements were Birth Preparedness and Complication

Readiness (BPCR) included factors related e) Population was pregnant women who live in the rural area, f) Research design was a cross-sectional study. This study excluded papers without full text or abstract conference.

Search strategy

End Note software is used for management references and finding the duplicates automatically. The process of study selection included the step of identification, screening, eligibility, and individual study include. The search term in the database we used Boolean term within PICO keyword: “Pregnant women” AND “Birth preparedness” AND “Rural Area”. Initially, we have identified the title and abstract according to PICO that we designed. Then, we excluded the study which did not meet in inclusion criteria. The study who selected were downloaded that full text and included study after finished critical appraisal. Included study extracted by PICOS format and applied *Preferred Reporting Items for Systematic Reviews & Met analyses*(PRISMA) 2009 to report the analysis of a qualitative study(see Figure1).

Figure1.Flowchart of study selection process



Results

Article Characteristics

This study included 11 articles of a cross-sectional study that measured Birth Preparedness/Complication Readiness Indicator. The published year between 2011-2019 was conducted in rural areas such as South-West Nigeria, Southern Ethiopia, Southeast Nigeria, Southwest Uganda, Northeast Ethiopia, Northwest Region of Cameroon, Tanzania, Nepal, Rwanda. Furthermore, the total sample size included in this study was 5431 pregnant women. Additionally, the sampling methods were used the Ballot method random sampling, clustering, software sampling, non-probabilistic, Multistage stratified random, and sampling single proportion

sample which dominated the methods. This individual study reported several data set included Ekiti State University Teaching Hospital (EKSUTH), Woreda 's health office Project, Secondary Health Facility in Abakaliki, Uganda community-based survey, Tehulederie district Amhara National Regional State, Bench Maji Zone Survey Southwest Ethiopia, Bamenda Health District in Cameroon, Agnuak Zone Southwest Ethiopia, Rukwa Region Survey, Dhulikhel Municipality Kavre District, Ruhengeri Hospital(see Table1).

Knowledge and Practice of Birth Preparedness and Complication Readiness

The main indicator of Birth Preparedness and Complication Readiness is defined as knowledge and practice (well prepared) of pregnant women. There are five main indicators of BP as saving money, mode of transportation, skilled provider, place of delivery and blood donor which are reported by %age. In addition, we reported the CR and other factors that relate to the BPCR. There are various results of %age in the knowledge of BPCR arranged between 0.89% - 100%. Meanwhile, the practice of BPCR has resulted in a %age of 13.1% as lowest and as high as 87.4%. It is presented as well prepared in the practice of BPCR. Even though, most of the studies reported a %age of each indicator in the knowledge of BPCR and report the practice of BPCR relatively in the total of BPCR.

Factors related Birth Preparedness and Complication Readiness

This study reveals various factors that influence the practice of BPCR in pregnant women. These factors include Parity [13-18], Prenatal care/ANC visits [13-21], Knowledge of BPCR [13, 21, 22], Wealth status [14, 21], Education of mothers [16-18, 20, 22], Mother's age [16], Gestational age [18, 19, 21], Occupational of mothers [17, 18, 20, 22], Partner's occupational [17, 19], Monthly income [20], Having information [22], Attitude of BPCR [21], Marital status [18].

Table1. Articles Characteristics

No	Author/Year	Study period	Country	Research method	Sampling Method	Sample size	Dataset
1	Aduloju,2017[13]	October-December 2016	South-West Nigeria	Cross-sectional study	Single proportion sample	325	Ekiti State University Teaching Hospital (EKSUTH), Ado-Ekiti, Nigeria
2	Andarge,2017[14]	March 2015	Southern Ethiopia	Cross-sectional study	Single population proportion	707	Woreda's health office Project
3	Anikwe,2020[15]	1st March 2019 and 31st July 2019	Southeast Nigeria	Cross-sectional study	ballot method	450	Secondary Health Facility in Abakaliki,
4	Asp,2014[16]	April to May 2011	Southwest Uganda	Cross-sectional study	two-stage cluster	376	community-based survey, Uganda
5	Endeshaw,2018[19]	2015	northeast Ethiopia	Cross-sectional study	single population proportion	507	Tehulederie district, Amhara National Regional State
6	Gudeta,2019[22]	December 0130/2016	Southwest Ethiopia	Cross-sectional study	single population proportion	605	Bench Maji Zone, Southwest, Ethiopia, 2016
7	Ijang,2019[20]	February to December,2016	Northwest Region, Cameroon	Cross-sectional study	non-probabilistic convenience	345	Bamenda Health District, Cameroon
8	Letose,2020[2]	March 10 to April	Agnuak	Cross-	Multistage	209	Agnuak Zone,

	1]	10, 2017	Zone, Southwest Ethiopia	sectional study	stratified random Sampling		Southwest Ethiopia
9	Moshi,2018[23]	June 2017 to October 2017	RukwaRegion, Tanzania.	Cross-sectional study	three-stage probability sampling	546	Rukwa Region Survey
10	Pun,2018[17]	November 2014 to November 2015	Nepal	Cross-sectional study	Software sampling	1011	Dhulikhel Municipality, Kavre District,
11	Smeele,2018[18]	July and November 2015	Rwanda	Cross-sectional study	N/A	350	Ruhengeri Hospital

*N/A:Not Available

Table 2.FactorsRelatedtoBirth Preparedness and Complication Readiness

No	Author/Year	Knowledge of BPCR Components (%)						Factorsrelated BPCR	Practice of Preparedness (Well Prepared)	
		Saving money	Mode of transportation	Skilled provider	Place of delivery	Blood donor	Complication readiness		BP (%)	CR(%)
1	Aduloju,2017[13]	N/A	N/A	N/A	N/A	N/A	Danger sign during pregnancy (74,8%) Danger sign during labor (26,6%)	Parity Prenatal visits Knowledge of danger during pregnancy	Prenatal visits <5 (67%)	Danger sign during pregnancy (78,1%) Danger sign during labor (30%)
2	Andarge,2017 [14]	88%	40.3%	27.3%	44.3%	5.8%	Danger sign during pregnancy (36.6%) Danger sign during labor(14,3%)	Wealth status Parity ANC visits	30.8%	
3	Anikwe,2020[15]	48.7%	29.6%	100%	N/A	0.89%	Danger sign during pregnancy (31.3%) Danger sign during labor(30.7%)	Parity ANC visits	41.9%	
4	Asp,2014[16]	Birth preparedness information by: Newspaper (33.9%) Radio (88.6%) Television (4.9)				N/A		Parity Education ANC visits Age	54.9%	N/A

5	Endeshaw,2018[19]	88%	38.8%	28.4%	85.8%	21.8%	- Decision maker in case emergency (58.6%) - Medical health facility in case emergency (82.4%) - Danger sign during pregnancy	Gestational age Start ANC visits Partner occupation	38%	
6	Gudeta,2019[22]	46.3%	18%	68.4%	85.2%	7.5%	- Recognition danger sign during pregnancy, labour, postnatal (68.4%) - Prepare childbirth material - Decision maker and support person	Education status of mother Occupational of mother Having information Knowledge of BP/CR	42.3%	
7	Ijang,2019[20]	83%	47.8%	15.7%	82%	29.6%	- Danger sign of pregnancy (53%) - Vaginal bleeding (73.9%)	Education Occupation Monthly income ANC visits	61.8% (adjusted overall of components BP/CR)	
8	Letose,2020[21]	N/A	N/A	N/A	N/A	N/A	danger sign during pregnancy, labor, postnatal (22%)	ANC visits Knowledge of BPCR Attitude of BPCR Age of the pregnancy Wealth status	40.5%	
9	Moshi,2018[23]	Knowledge of BPCR = 5.58±4.591 (Mean ± SD)					danger sign during pregnancy, labor, postnatal	N/A	N/A	N/A
10	Pun,2018[17]	54.2%	30.0%	40.8%	67.1%	13.3%	N/A	Sociodemographic History of obstetric	35.5%	
11	Smeele,2018[18]	76.9%	67.1%	17.7%	76.3%	N/A	danger sign during pregnancy, labor, postnatal (73.1%)	Marital status Age Education Parity Occupation ANC visits	Mean of total BPCR (32.78%) Identified health facility (19.4%) Arranged of transport (21.7%) Saved money (87.4%) Skilled of birth	

									attendant (13.1) No. of step taken (22.3%)
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**N/A:Not Available*

Discussions

Articles Characteristics

These results of this study describe the knowledge and practiced of Birth Preparedness and Complication Readiness includes the factors influencing of Birth Preparedness. The most common study conducted in Africa country such as Nigeria, Ethiopia, Cameroon and other countries Uganda, Tanzania, Nepal, and Rwanda. The factors of BPCR practice reported from the significant results in each individual study of cross-sectional study, then could not report the variable which did not have significant relations. Several studies reported by percentage, but there is one study which report mean of scoring in knowledge of BPCR. Furthermore, this study focuses on Rural Area, and did not show other advanced/wealth country.

BPCR exposure related the practiced of that, there are only few studies then there is one systematic review which coverage related factor in Ethiopia Country and describe that the prevalence case of childbirth at home was high. Otherwise, it also coverage that maternal mortality because in they are in the rural area which have the characteristic of the socio demographic such as few chances to get education, difficult to getting information, having problem to earn money, and less ANC attendance.

Knowledge and Practice of BPCR

Most of the cross-sectional studies above, reported the presentation of knowledge of BPCR on each indicator, while the other studies did not report the presentation of readiness to give birth with preparation for BPCR. In addition, one other study reported mean scores from knowledge of BPCR and childbirth-related factors. In practice, most of the studies reported the percentage of delivery attendance by full BPCR (mean of total BPCR indicators). However, there is a study conducted by Smeele, 2018 which reports details of the BPCR practice of each identified health facility (19.4%), transportation arrangements (21.7%), money saved (87.4%), labor skilled birth attendant (13.1), Number of steps taken (22.3%).

Factor Related to Birth Preparedness

The incidence of parity and the presence of ANC are the most found factors and have significant results on childbirth readiness. In addition, the other factors described above also contribute to the readiness to give birth. However, it should be noted that the results of this study were mostly obtained in rural areas in African states, so further studies are needed from other developing countries in Asian countries.

Expected further research

Based on the articles found in this study, it is hoped that there will be a longitudinal study to determine the interaction between variables in BPCR. This cross-sectional study is the starting point to be able to carry out continuous research such as observational studies and continue to design appropriate intervention designs for prevention as well as overcome the problems of the factors that have been studied in the current study.

Study limitations

This study only describes the prevalence of BPCR exposure and Childbirth Preparation cases and only focuses on rural areas, but most of them are only found in African countries. This study limits the design of a cross-sectional study, so the results or factors related to birth preparedness are limited. Also, the reporting of each individual study appears inconsistent.

Conclusions

In the last 10 years, research has been limited to factors related to childbirth preparation and BPCR practice and knowledge. However, the results of this study can be used as a basis for further studies related to BPCR interventions in other developing countries, especially Indonesia. Furthermore, the findings of this study found that the most common factors related to birth preparedness were parity rate and prenatal attendance or ANC.

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