



# Maternal Factors to Prevent Obstetric Complications in Banyumas District, Indonesia

Arif Kurniawan\*, Colti Sistiarani, Elviera Gamelia

Department of Public Health, Faculty of Health Sciences, Jenderal Soedirman University, Purwokerto, Indonesia

## Abstract

**BACKGROUND:** The number of pregnant women in the district of Banyumas reached 30,939 in 2012, the number of mothers who detected a high risk reached 20.05%. High-risk pregnant women tend to be more likely to have obstetric complications. The incidence of preeclampsia (8.13%) and hemorrhage (7.27%) is an obstetric complication. Obstetric complication leads to maternal deaths in the district of Banyumas.

**AIM:** This study aims to determine the influence of maternal factors to prevent obstetric complications.

**METHODS:** This study aims to determine the influence of maternal factors to prevent obstetric complications. This type of research is descriptive analytic. This research is using cross-sectional approach. Population this study are pregnant women who are in the subdistricts of Banyumas and Pekuncen. Samples taken as many as 188 pregnant women in both regions.

**RESULTS:** The result showed that as many as 27.1% of women have a risk pregnancy, as many as 36.7% of women had low knowledge about high-risk pregnancy, as many as 47.9% of women have an lack attitude high-risk pregnancy, as many as 41.5% of mothers have poor affordability in antenatal care, and as many as 36.7% of mothers have less family support on high-risk pregnancy. There are influence knowledge, attitudes high-risk pregnancy, and antenatal care affordability toward the prevention of obstetric complication.

**CONCLUSIONS:** Factor most influential in the prevention of obstetric complication is affordability antenatal care.

Edited by: Sasho Stoleski

Citation: Kurniawan A, Sistiarani C, Gamelia

E. Maternal Factors to Prevent Obstetric

Complications in Banyumas District, Indonesia.

OpenAccessMacedJMedSci.2022May16;10(E):1209-1214.

<https://doi.org/10.3889/oamjms.2022.8497>

**Keywords:** Maternal factors; High risk pregnancy;

Obstetric complication

\*Correspondence: Arif Kurniawan, Department of Public

Health, Faculty of Health Sciences, Jenderal Soedirman

University, Purwokerto, Indonesia. E-mail: arifkurnia78@

ymail.com

Received: 03-Jan-2022

Revised: 03-Mar-2022

Accepted: 06-May-2022

Copyright: © 2022 Arif Kurniawan, Colti Sistiarani,

Elviera Gamelia

Funding: This research was funded by LPPM Jenderal

Sudirman University

**Competing Interests:** The authors have no conflict of

interest associated with the material presented in this

paper.

**Open Access:** This is an open-access article distributed

under the terms of the Creative Commons Attribution-

NonCommercial 4.0 International License (CC BY-NC 4.0)

## Introduction

Obstetric complications are defined as an acute condition that arises and can be a cause of maternal death. These circumstances include the direct causes and indirect causes. The direct causes such as antepartum and postpartum hemorrhage, obstructed labor, postpartum sepsis/postpartum infection, complications from abortion, pre-eclampsia or eclampsia, ectopic pregnancy, and rupture utery. Indirect causes include anemia, malaria, and tuberculosis [1].

The number of pregnant women in Banyumas in 2012 as many as 30,939 people, the number of detection risk many as 6986 pregnant women. Referral of the cases of high maternal risk in Banyumas is many as 6206 pregnant women. This shows the amount of high-risk pregnant women in Banyumas reached 20.05% of the total amount of all pregnant women. Cases of obstetric complications among others preeclampsia as much as 8.13% and bleeding as much as 7.27%. Eclampsia and bleeding can occur in groups of pregnant women at high risk, it was related to the possibility of women experience obstetric complications [2].

Research results Ambarwati *et al.* about the causes of high-risk pregnant women showed that

higher risk of pregnancy is not only influenced by several factors that are interrelated, namely, medical and non-medical factors. Non-medical factors, there is socioeconomic and maternal reproductive health. Maternal reproductive health status such as maternal age, parity, spacing pregnancies, lack of family support, and the public about the high-risk pregnancy. High-risk pregnancy can be prevent through antenatal care practices during pregnancy. Sholikhah research shows service quality antenatal care of pregnant women affect the interest in utilizing the repeated antenatal care services in health centers [3], [4].

Quality antenatal care strategies must be done, so that the condition of the mother and the fetus can be well controlled. Antenatal examination is the examination of pregnancy followed by an attempt correction of irregularities which were found. Continuous antenatal care can be directed to the segment-risk pregnancy. Antenatal care can know the risks and complications so that pregnant women can be directed to make a referral to the hospital. Services carried out on a regular basis are a risk pregnancies, early detection can be done immediately so that appropriate measures to tackle and to plan and improve the pregnancy [5].

Obstetric complications are an event that can be experienced by the mother during pregnancy,

childbirth, and postpartum. The incidence of obstetric complications can occur suddenly. Prevention of obstetric complications can be done through efforts to bring maternal care. Factors related to the utilization of maternal services can be seen from the sociocultural factors that include maternal age, marital status, religion, family size, maternal education, education husband, and the authority of women in the family. Factors perception related to efforts to use maternal services are availability of information, knowledge about health, a planned pregnancy status, receipt of quality of service, utilization of antenatal care, utilization of services before birth, birth order, and experience complications. Economic affordability factor includes the work of midwives, husbands job, and the ability to pay. Affordability factors include the physical aspects of the location and transport distance. The service efforts include prevention of obstetric complications and emergency service [6]. Research on the prevention of obstetric complications is necessary to determine the relevant factor in the prevention of obstetric complications.

## Methods

This research is analytic with cross-sectional approach strategy. The population in this study were pregnant women who were in the subdistrict of Banyumas and subdistrict of Pekuncen. The sample size was calculated considering a Type 1 error of 5%, a level of accuracy of 0.05, and 95% confidence interval (CI). The sample used in this study amounted to 188 pregnant women (Table 1). Sampling was done by stratified random sampling technique. Criteria for inclusion in this study were women who are willing to become respondents.

Data were obtained through interviews using a questionnaire about knowledge, attitude, high-risk pregnancy, antenatal care affordability, support families and communities in high-risk pregnancies, and prevention of obstetric complications. Data retrieval mother's reproductive health status is done by checking the mother's health record that is in the MCH (Maternal Child Health) book. Before this research, it conducted trials against the instrument through validity and reliability test. Reliability is done by comparing with Cronbach alpha, with a coefficient of 0.7425.

### Statistical analysis

Data analysis was performed through univariate analysis, bivariate, and multivariate analysis. Univariate analysis was to describe the reproductive health status, knowledge of high-risk pregnancy, attitudes about high-risk pregnancy, antenatal care affordability, families

**Table 1: Frequency distribution maternal characteristics**

Variable	Category	Frequency	Percentage
Mothers occupation	Servant Government	6	3.2
	Entrepreneur	12	6.4
	Maid	6	3.2
	Not working	164	87.2
Mothers age	20–35 years	136	72.3
	> 35 years	52	27.7
Income	< 1.100.000 rupiah	78	41.5
	≥ 1.100.000 rupiah	110	58.5
Education Level	Education not completed	6	3.2
	Elementary graduated	56	29.8
	Junior High School Graduated	71	37.8
	Senior High School Graduated	44	23.4
	Diploma/University Graduated	11	5.9
Risk Pregnancy	No Risk	137	72.9
	Risky	51	27.1
High Risk Pregnancy	Less	69	36.7
	High	119	63.3
Knowledge	Less	90	47.9
	Well	98	52.1
Affordability Antenatal Care	Lack	78	42.6
	Well	110	57.4
Family and Community Support	Lack	66	35.1
	Support	122	64.9
Prevent Obstetric Complication	Lack	78	41.5
	Well	110	58.5
Parity	≤ 4	184	97.8
	> 4	4	2.1
Disease History	Yes	8	4.3
	No	180	95.7
Spacing Birth	≤ 3	14	7.5
	> 3	174	92.5
Complication History	Yes	94	50
	No	94	50
	a. Infection	52	53.2
	b. Hemorrhage	34	36.2
Antenatal Care	c. Preeclampsia	8	8.6
	Routine	164	87.2
	Not routine	24	12.8

and communities support for high-risk pregnancy, and prevention of obstetric complications. Bivariate analysis using Chi-square test to analyze related mother's reproductive health status, knowledge, attitudes about high-risk pregnancy, affordability antenatal care, family support, and community for high-risk pregnancy to prevent obstetric complications. Multivariate analysis using logistic regression to determine which variables are most influential to prevent obstetric complications.

### Ethics statement

This study has been approved by the Ethical Committee of Medical Faculty, Jenderal Soedirman University (No.2187). Participants entered the study after providing informed consent and the questionnaires were anonymous.

**Table 2: Related maternal factors to prevent obstetric complication**

Variable	Category	Prevent obstetric complication				Total	p value	
		Lack		Well				
		N	%	n	%			
Risk pregnancy	No Risk	59	43.1	78	56.9	137	100	0.947
	Risky	21	41.2	30	58.8	51	100	
mothers High-risk pregnancy knowledge	Less	39	56.5	30	43.5	69	100	0.005
	High	41	34.5	78	65.5	119	100	
High-risk pregnancy attitude	Less	49	54.4	41	45.6	90	100	0.003
	Well	31	31.6	67	68.4	98	100	
Affordability antenatal care	Lack	45	57.7	33	42.3	78	100	0.001
	Well	35	31.8	75	68.2	110	100	
Family and community support	Lack	33	50	33	50	66	100	0.172
	Support	47	38.5	75	61.5	122	100	

**Table 3: Multivariate Modeling Step 1**

Variable	p value	OR	95% CI
High-risk pregnancy knowledge	0.039	1.964	1.035–3.728
High-risk pregnancy attitude	0.041	1.942	1.028–3.668
Affordability antenatal care	0.023	2.132	1.108–4.104
Family and community support	0.543	1.228	0.634–2.377

## Results

From the results of statistical analysis of variables, if variables have  $p \leq 0.05$ , related variables to prevent obstetric complications include knowledge of high-risk pregnancy ( $p = 0.005$ ), the attitude of high-risk pregnancies (0.003), and affordability of care antenatal (0.001) (Table 2). Variables mothers status of the risk of pregnancy ( $p = 0.947$ ), family and community support ( $p = 0.172$ ) are not associated to prevent of obstetric complications, because  $p > 0.05$ . The results of multivariate analysis showed influence to prevent of obstetric complication, there are knowledge of high-risk pregnancy, attitude of high-risk pregnancy, and antenatal care affordability (Tables 3 and 4).

## Discussion

### ***Influence knowledge of high-risk pregnancy to prevent obstetric complications***

Mothers, who do not understand very well that the potential information obstetric complications experienced during pregnancy, childbirth, and postpartum, can be caused by several factors. Research Mitra *et al.* stated someone who has a good level of knowledge about nutrition, education levels, attitudes about nutrition, and higher status jobs [7]. Mothers who have good knowledge about high-risk pregnancies may be affected by the implementation of the class of pregnant women which have been running regularly every month. Class of pregnant women is an activity performed by community health centers by involving midwife as facilitator. Pregnant women class utilizes MCH book as a means of learning about the early detection of obstetric complications. MCH book is a means that contains information about the maternal and child health information. Information on pregnancy is available in MCH book, but information about obstetric complications has not been mentioned in detail in the MCH book. Pregnant women from prenatal class activities to enhance knowledge of mothers about pregnancy care effort. The information discussed that in class pregnant women include information about

**Table 4: Multivariate modeling final**

Variable	p value	OR	95% CI
High-risk Pregnancy Knowledge	0.033	2.003	1.059–3.788
High-risk Pregnancy Attitude	0.044	1.918	1.018–3.615
Affordability Antenatal care	0.014	2.233	1.180–4.266

pregnancy, danger signs of pregnancy, and pregnancy-related myths.

Olorunda *et al.* research results expressed knowledge about the effects of pregnancy-related maternal risk factors showed that mothers do not understand the risks associated with pregnancy the mother's age. This is an evident ignorance regarding risk expectant mothers over the age of 35 years who may give birth to infants with the risk of disability/developmental disorders, pregnancy young age has the possibility to give birth to a child with a developmental disorder, and the mother also can potentially give birth by cesarean way [8]. Mother assumption regarding high-risk pregnancy is not associated with the incidence of obstetric complications.

Knowledge of young pregnant women in the region Kerek Community Health Center about reproductive health and pregnancy is relatively less. Therefore, it needs to be increased further information about reproductive health and high-risk pregnancies in the community, especially in young-old women and all pregnant women to reduce the incidence of high-risk pregnancies. [9]. Still found mothers who do not understand about high-risk pregnancy can be caused by the perception of pregnancy that is natural to assume high-risk pregnancy only associated with health reproductive status so that the mother's age is too young, too old, too much delivery baby, and is too close spaced births.

### ***Influence attitude of high-risk pregnancy to prevent of obstetric complications***

According to Heaman Gupton, perception and understanding of the risk of pregnancy are important, because it can affect the use of women's health care, the motivation to seek prenatal care, adherence to the recommendations of the inspection, and the behavior of the mother's health during pregnancy. Perception of high-risk pregnant women can affect their health behaviors during pregnancy [10], [11]. Related to this study, the behavior of the mother's health during pregnancy is seen the extent, which the prevention of obstetric complications that have been carried out by mother.

Risk perception based on several studies in which high-risk perception seen from pregnancy and birth experience. Research suggests that women consider more high risk associated with the age of the mother during pregnancy has been aged, it can cause health problems in their infants [11]. The introduction of the high-risk mothers can be done by proactively and as early as possible in early pregnancy. High-risk pregnancy can be prevented and treated properly when symptoms or risk factors discovered as early as possible.

Research studies by Lee *et al.* stated perception informant on high-risk pregnancy, among

others seen from the medical risks associated complications of pregnancy, physical activity mother was limited, the results of screening tests mothers who did not support the pregnancy, worse reproductive status mother, and anxiety/psychological mothers, as well as age of the mother during pregnancy. Mothers tend to recognize their age to assess risk factors for pregnancy [11]. Gestational age of 35 years or more in the context of a healthy woman without any other high-risk factors is considered as low-risk pregnancy. Other things consider maternal reproductive history there is age, high- risk detection through antenatal care, and pregnancy- related maternal with culture. Women with risk pregnancies aware of the risks in their pregnancy, but women do not consider extreme risk pregnancies that may affect to prevent of obstetric complications. Women with socioeconomic status higher are more likely to worry about the risk, although low socioeconomic status is associated with an increased risk of pregnancy. There is a correlation between high-risk pregnancies with higher levels of anxiety. Women who are considered at high risk of pregnancy are not a risk in the extreme, so there is an attempt to contact with a health professional for medical care related efforts pregnancy test results [11].

Nurkhasanah and Mass research mentioned that cultural factors and beliefs about pregnancy can bring positive and negative effects on the reproductive health of mother, there are many mothers who are less aware of the importance of examination of pregnancy as a high-risk pregnancy detection. Lack of awareness of the importance of detection of high-risk pregnant women, causing mothers aware of the high risk during childbirth, knowing the high risk of delay in the mother can affect, mother gets aid delivery delays, and prevention of obstetric complications [12], [13].

Research in Jagir Community Health Center, Surabaya found no effect of empowering pregnant women for early detection of pregnancy trimester one [14]. Pregnant women empowerment is expected to change knowledge, attitudes, and behaviors of mothers about early detection of pregnancy. Banyumas Health Center effort safe motherhood has been made in Program Expanding Maternal and Neonatal Survival (EMAS). EMAS program emphasizes the aspect of strengthening the health-care system, the health Empowerment efforts are not change knowledge, attitudes, and behavior of mother in the early detection of pregnancy risks. Expected the program, MCH book can change the attitudes of mothers to pregnancy care and prevent of obstetric complications.

Based on research, Sistirani *et al.* concluded that there is a relationship between knowledge of MCH book with quality use MCH book [15]. The result shows that mothers have less knowledge about high-risk pregnancy. It has an impact to attitudes of mothers of high-risk pregnancy. Mothers attitude about high-risk pregnancies can be attributed to the quality use MCH

book. Utilization MCH book will be able to improve the high-risk pregnancy prevention one of them access to antenatal care and prevention of obstetric complications. Perception of service quality is the most important factor influencing the choice of obstetric care facilities [16]. Mothers have a good attitude, who have a tendency to seek the prevention of obstetric complications which could possibly occur during pregnancy.

### ***Influence antenatal care affordability to prevent of obstetric complications***

Prenatal care commonly referred to antenatal care that given to mother before giving birth or during pregnancy. Maintenance of pregnancy is an effort maintenance of the health of mother. Upbringing of pregnancy is necessary because although in general, the pregnancy develops normally and produces healthy babies birth at term through the birth canal, but sometimes not as expected. Difficult to know advance pregnancy would be a problem. Antenatal care is one of the early prevention of risk factors for pregnancy. If the mother does not do prenatal care, it will not be known whether the pregnancy went well or has a high risk of obstetric complications and danger the mother and fetus [17], [18].

Mothers do not perform routine antenatal care as many as 24 people (12.8%), routine antenatal care only from the aspect of the frequency of antenatal checks carried out as many as 4 times, one in the first trimester, one in the second trimester, and twice in the third trimester. Affordability is seen in this study that includes the access of mothers in costs, transport, and type of antenatal care received. It is the prevention of obstetric complications which high-risk pregnancy can be minimized through proper prenatal care efforts and carried out to the fullest. Efforts prenatal care alone is not enough in the prevention of obstetric complications, other things that can be done through the financing of health services, especially in high-risk pregnancy. Pregnant women have been getting health insurance entirely, besides a program providing nutritional supplementation to pregnant women has been conducted and focused who had chronic energy deficiency (CED).

Research Rauf stated that relationship between affordability with antenatal care [19] where the affordability of antenatal care related to prevent of obstetric complications due to antenatal care quality can be detected as early as possible the possibility of mother who suffered complications and extrapolate obstetric complications that can occur in women during pregnancy and delivery. Prevention of obstetric complications can be done health workers and mothers of antenatal examination results and followed up with good prenatal care to women with high-risk pregnancy or the mothers are not risky.



### **No influence of family and community support to prevent of obstetric complications**

Provision of information, education, and communication about the danger signs of pregnancy and childbirth needs to be recommended, especially in women also the family and society [20]. Mother who have supported by family and community can be seen from the efforts Banyumas of district health offices which making efforts safe motherhood. Efforts made through the MCH book program, delivery planning and prevention of complications program/Program Perencanaan Persalinan, and Pencegahan Komplikasi (P4K). Stickers P4K program contains data about the mother's name, estimated birth, birth attendants, where labor, labor companion, transportation, potential, and also blood donors. Research Mulyati et al. showed no relationship implementation P4K program with early detection of high-risk pregnant women [21]. P4K program execution cannot be separated from the role of the community, especially the health volunteer. P4K is to socialize importance and to prevent high-risk pregnancy. The behavior of health workers can be determined to community support/social support where associated to prevent of obstetric complications. The family is an organization of consumer purchases, particularly in the aspect of material support, psychological support related to prevent of obstetric complications to the mother, family has an important role in society. There is no relationship between family support with utilization of antenatal care, mother who have family support will utilize of antenatal care efforts [20], [21]. Sholikhah study showed that knowledge and health volunteers attitude in the early detection efforts are lack. Activities early detection of high risk to mother still not done, because only new health volunteer carrying out routine activities every month. This caused health volunteer did not training and coaching. Kasango study results prove that the 715 mothers who had previously obstructed predictable and 90% of women identified as high-risk pregnant women actually have never experienced complications in her pregnancy [4].

### **No related high-risk mother status to prevent of obstetric complications**

The concept of high-risk pregnancies can be made up of two components, namely, physiological factors as reproductive status that do not support and early detection of pregnancy and childbirth assistance. Physiological factors on reproductive status do not support such factors maternal age exceeds 35 years, young maternal age as under 20 years old, and mothers who had a previous birth spacing too close.

The status of women with high-risk pregnancies not regarded as extreme risks that have implications for medical care during pregnancy and childbirth. Women with lower socioeconomic status tend to be associated with an increased risk of pregnancy. According to the

research, Lee obstetric emergency care in rural areas is very low at only 5% in the South Asian region, even 1% in rural sub-Saharan Africa. The lower utilization is due to the very high cost to obtain emergency obstetric care [8], [22], [23], [24], [25], [26].

Results of the study showed that the majority (50%) respondents had a history of complications during pregnancy. Reproductive status in women related to the incidence of obstetric complications among others, parity, and history of pregnancy complications. Attitude and place of delivery are also a factor that is associated with the incidence of obstetric complications [27]. History of women experience obstetric complications in the previous pregnancies can be an experience to take steps to prevent obstetric complications through appropriate prenatal care.

## **Conclusion**

The results in this research conclude that influences to prevent of obstetric complication are knowledge of high-risk pregnancy, attitude of high-risk pregnancy, and antenatal care affordability. Mothers need to improve knowledge, attitude, and affordability of antenatal care be able to take steps to prevent obstetric complications.

## **Author Contributions**

Conceptualization, methodology, and original draft: AK. Data analysis, writing, review and editing, and manuscripts: CS.

## **References**

1. McCharty J, Maine DA. Framework of analysis the determinants of maternal mortality. *Stud Fam Plann.* 1992;23(1):23-33. <https://doi.org/10.2307/1966825>  
PMid:1557792
2. Dinas Kesehatan Kabupaten Banyumas. Profil Dinas Kesehatan Kabupaten Banyumas; 2012. Available from: <https://pusdatin.kemkes.go.id/>Last accessed on 23 Sep 2021
3. Ambarwati MR, Yunliana R, Wisnu NT. Mapping of high-risk detection of women pregnancy on antenatal care in Talise Health Center, Palu City, Indonesia. *Gac Sanit.* 2021;35 Suppl 2:S152-S158.
4. Sholikah HH, Kusumawati L, Mardiyanto P. Why pregnant women delay to initiate and utilize free antenatal care service: a qualitative study in the Southern District of Mzimba, Malawi, *Global Health Journal,* 2021;5:74-78. <https://doi.org/10.1016/j>

- glohj.2021.04.001
5. Kementerian Kesehatan RI. Pedoman Pelayanan Antenatal, Persalinan, Nifas dan Bayi Baru Lahir di Era Adaptasi Kebiasaan Baru. 2020. Available from: <https://covid19.go.id/storage/app/media> [Last accessed on 2021 Sep 23].
  6. Gabrysch S, Campbell OM. Still too far to walk: Literature review of the determinants of delivery service use. *BMC Pregnancy Childbirth*. 2009;9:34. <http://www.biomedcentral.com/1471-2393/9/34>  
PMid:19671156
  7. Heaman MI, Gupton AL. Psychometric testing of the perception of pregnancy risk questionnaire. *Res Nurs Health*. 2009;32(5):493-503. <https://doi.org/10.1002/nur.20342>  
PMid:19606451
  8. Lee S, Ayers S, Holden D. Risk perception of women during high risk pregnancy; A systematic review. *Health Risk Soc*. 2012;14(6):511-31. <https://doi.org/10.1080/13698575.2012.701277>
  9. Khan SS, Tawale NK, Patel A, Dibley MJ, Alam A. "My husband is my family." The culture of pregnancy disclosure and its implications on early pregnancy registration in a child nutrition intervention in rural Maharashtra, India. *Midwifery*. 2021;103:103141. <https://doi.org/10.1016/j.midw.2021.103141>
  10. Merriel, A, Maharjan, N, Clayton, G, Toolan, M, Lynch, M, Barnard, K, Lavender, T, *et al.* A cross-sectional study to evaluate antenatal care service provision in 3 hospitals in Nepal. *AJOG Global Reports*; 2021.
  11. Sugiarti, Soedirman O, Mochny IS. Efforts to empower pregnant women for early detection of high risk of first trimester pregnancy. *Indonesia Journal Public Health*. 2012;9(1):27-36.
  12. Sistiaroni C, Gamelia E, Hariyadi B. Analysis of the quality of the use of maternal and child health books. *KEMAS*. 2014;10(1):14-20. Available from: <http://journal.unnes.ac.id/nju/index.php/kemas>.
  13. Iyaniwura CA, Yussuf Q. Utilization of antenatal care and delivery services in Sagamu, south western Nigeria. *Afr J Reprod Health*. 2009;13(3):111-22.
  14. Syaifudin. *Periodical obstetrics*. Jakarta: Penerbit EGC; 2002.
  15. Wiknjosastro H. *Obstetrics*. Jakarta: Yayasan Bina Pustaka Sarwono Prawirohardjo; 2006.
  16. Rauf NI. Factors Related to the Utilization of Antenatal Care Services at the Minasa Upa Health Center Makassar City 2013. Available from: <http://repository.unhas.ac.id/bitstream/handle/123456789/5481/NUR/INAYAH/RAUF/K/11/09/343.pdf&ei>. [Last accessed on 2013 Aug 20].
  17. Hailu D, Berhe H. Knowledge about obstetric danger signs and associated factors among mothers in Tsegedie district, Tigray region Ethiopia: Community Based cross sectional study. *PLoS One*. 2014;9(2):e83459. <https://doi.org/10.1371/journal.pone.0083459>  
PMid:24516516
  18. Lestari, A, and Nurrohmah A. Knowledge of pregnant women about high-risk pregnancies in the working area of the Cepogo Health Center, Boyolali Regency. <https://doi.org/10.31603/bnur.4884>
  19. Notoatmodjo S. *Health Education and Behavior*. Jakarta: Rineka Cipta; 2003.
  20. Ariyanti L. Factors Related to Utilization of Antenatal Services by Pregnant Women in Godog Village, Polokarto District, Sukoharjo Regency in 2012; 2012. Available from: <http://eprints.undip.ac.id/38651/1/4362.pdf&ei>. [Last accessed on 2013 Aug 20].
  21. Kotler P. *Marketing Management*. Jakarta: Terjemahan oleh Benyamin Molan; 2005.
  22. Mulyati, Yulianti T. Implementation of Delivery Planning and Complication Prevention Programs with Early Detection of High-Risk Pregnant Women. *J Kebidanan*. 2012;4(2):71-83. <https://doi.org/10.36049/jgk.v8i2.152>
  23. Saptarini I and Suparmi. Antenatal Care Service Utilization And Completeness In Kebon Kalapa Village, Bogor City 2014. *Buletin Penelitian Kesehatan* 2016;44(3):173-180.
  24. Surininah. *Pregnancy and Childbirth Smart Book*. Jakarta: PT Gramedia Pustaka; 2008.
  25. Arsyad ML. Proportion Of Pregnant With High Risk Which Were Reference In Under Develop Area. *Berita Kedokteran Masyarakat*. 2008;24(1):34-37.
  26. Lee AC, Cousens S, Darmstadt GL, Blencowe H, Pattinson R, Moran NF, *et al.* Care during labor and birth for the prevention of intrapartum related national death: A systematic review and Delphi estimation of mortality effect. *BMC Public Health*. 2011;11(Suppl 3):510. <https://doi.org/10.1186/1471-2458-11-s3-s10>
  27. Huda LN. Reproductive Status Relationship, Status Health, Access to Health Services with Obstetric Complications in Banda Sakti, Lhokseumawe 2005. *KESMAS, Jurnal Kesehatan Masyarakat Nasional*. 2007;1(6): 275-81. <https://doi.org/10.21109/kesmas.v1i6.288>