

Factors Affecting the Utilization of Postnatal Care Services in Primary Health Care Facilities in Urban and Rural Settlements in Kaduna State, North-western Nigeria

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Abstract Globally, more than 830 women die daily from pregnancy or childbirth-related complications especially in developing countries. Despite its importance, utilization of postnatal care services in Nigeria is very low due to various factors. This study assessed and compared the factors affecting the utilization of postnatal care services in primary health care facilities in urban and rural settlements in Kaduna State, Nigeria. The study was a cross-sectional, community-based and mixed method study carried out in Sabon Gari (an urban) and Giwa (a rural) Local Government Areas in July 2017. Multistage sampling technique was used to select 410 households in each study area where structured questionnaires were administered. The data was analysed using SPSS[®] version 20.0. Results were presented in charts and tables. Postnatal care services utilization was 73.7% and 61.4% in the urban and rural settlements respectively. Multivariate analysis identified antenatal attendance, large baby, poorest wealth quintile, transportation problems to the health facilities, and maternal age as predictors of postnatal care services utilization in the urban settings. In the rural settings the predictors were antenatal service attendance, hospital waiting time, family and financial problems. However, focus group discussion findings showed that there were not many differences in urban and rural areas. There were different predictors of postnatal services utilization in both urban and rural study areas. The state public health authorities need to take steps to address the various factors that deterred utilization of postnatal care services.

Keywords: utilization, postnatal care, primary health care, rural and urban settlements

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1. Introduction

There is evidence that a large proportion of maternal and neonatal deaths occur during the first 48 hours after delivery [1]. Worldwide, approximately 800 women die daily from avoidable pregnancy and childbirth-related causes. In 2010, about 287,000 women died worldwide during and following pregnancy and childbirth [2,3].

The maternal mortality ratio (MMR) in developing regions is 15 times higher than in developed regions [2,4,5] and sub-Saharan African countries have the highest MMR in the world with an average of 500 maternal deaths per 100,000 live births, accounting for 50.0% of the world's total maternal deaths [2,3,6].

With nearly 90,000 deaths in the first 24 hours of life, Nigeria has the second highest burden of first day deaths in the world [7]. Although the maternal mortality rate is high in Nigeria, there are considerable regional variations. According to the 2016-2017 Nigerian Multiple Indicators and Cluster Survey (MICS), the national PNC utilization was 37.1% [8] which was lower than 42.0% reported in the 2013 NDHS [1]. Overall, 62.9% of women had no postnatal check-up [8]. The national PNC urban/rural utilization figures were 58.9% and 27.8% respectively [8]. Eighty-one percent of women in the northwest region had no postnatal check-up, as compared with 24% in the southwest [8,9]. In Kaduna State, the PNC utilization declined from 50.4% in 2013 to 36.9% in 2016-2017 [1,8].

There is no single, simple intervention that will substantially reduce maternal mortality; however, different

studies have documented important multiple interventions such as a strong health system, good antenatal care (ANC) services, skilled birth attendants and good PNC services utilization [10,11,12]. The 2013 WHO guidelines on postnatal care (PNC) recommend that: after an uncomplicated vaginal birth in a health facility, healthy mothers and newborns should receive care in the facility at least for 24 hours after birth [13].

There is paucity of research to determine the various predictors of PNC utilization in urban and rural areas in Kaduna State. This study assessed and compared the factors affecting the utilization of PNC services in primary health care facilities in urban and rural settlements in Kaduna State, Nigeria.

2. Materials and Methods

2.1. Study Areas

Two political wards, each including their PHC facilities, were studied in Giwa Local Government Area (LGA) which is predominantly rural and Sabon Gari LGA which is predominantly urban. The projected populations of Sabon Gari and Giwa LGAs, in 2014, were 374,302 and 342,009 respectively [14,15]. The two wards studied in Giwa LGA were Gangara and Dan Mahawayi communities, while those studied in Sabon Gari LGA were Jushi and Muchia communities. The predominant ethnic groups in both study communities were the Hausa/Fulani who were mainly Muslims.

2.2. Study Design

This was a descriptive cross-sectional and community-based carried out in July 2017. It was a mixed method study involving both qualitative and quantitative data collection methods.

2.3. Study Population

The study population included mothers within the postpartum period. All mothers with live births whose children survived beyond the first 42 days postpartum in the last 12 months prior to the study and children within one year of delivery were included in the study while postpartum mothers who were acutely ill and children older than one year of age were excluded from the study.

2.4. Sample Size Estimation

The sample size was calculated using the formula for estimating the minimum sample size for descriptive studies:

$$n = 2x(Z_{\alpha} + Z_{\beta})^2 \frac{[p_1(1-p_1) + p_2(1-p_2)]}{(p_1-p_2)^2} \times \frac{1}{1-f}$$

Where n = minimum required sample size.

2 = Design effect [16,17,18].

Z_{α} is standard normal deviate corresponding to level of significance (usually 5%) at 95% confidence interval = 1.96.

Z_{β} is standard deviate corresponding to power of $1-\beta$. The power of the test is set at 80% = 0.84

P_1 = Postnatal care services utilization in an urban settlement from previous study. Therefore, $P_1 = 0.169$ [19].

P_2 = Postnatal care services utilization in a rural settlement from previous study. Therefore, $P_2 = 0.29$ [1].

$1-p_1$ = Proportion of mothers in urban settlement who did not utilize postnatal care services.

$1-p_2$ = Proportion of mothers in rural settlement who did not utilize postnatal care services.

f = expected non-response rate i.e. 10% of all the subjects enrolled in the study [18,20-25].

n = 408, hence 410 respondents were recruited in each study arm thereby giving a total of 820 respondents in both arms of the study.

Precision level was set at 5% and an anticipated response rate was 90%.

2.5. Sampling Technique

A multi-stage sampling technique was used to select the participants in the study.

2.6. Data Collection

A structured, interviewer-administered questionnaire, adapted from the 2013 NDHS [1] was used to capture information on socio-demographic characteristics of the respondents and the utilization of PNC services in PHC facilities in the study areas. The questionnaires were administered using the Epiinfo[®] digital mobile data collection method.

For the qualitative aspect of the study, a total of eight Focused Group Discussions (FGD) were carried out, two in each of the selected wards. A FGD guide adapted from past similar studies was used to obtain data [26,27]. In each of the ward, 2 FGDs with 8 purposely selected participants were conducted; one with mothers with no education, while the second FGD was with mothers with at least primary education. This was informed by the need to have a more homogeneous group and by the fact that maternal education has been found to be significantly associated with the PNC attendance [28,29,30]. The FGDs were conducted in Hausa language and the discussions were tape recorded, transcribed into Hausa and subsequently back-translated into English language.

2.7. Statistical Analyses

The data collected was cleaned, entered and analyzed using SPSS[®]20.0 software (IBM, SPSS Inc., Chicago, USA). Multivariate analyses were used to examine the association between the study variables and individual characteristics. The independent variables were analyzed using binary logistic regression analysis [31]; adequate PNC utilization was used as the dependent variable and made dichotomous. Adequate utilization of PNC services was considered if mothers and their babies were checked at least four times by skilled birth attendants within 42 days postpartum [13]. The predictor variables that were used for the analysis included: age, sex, religion, mother's educational status, father's educational status, father's occupation, birth order, mother's occupation, mother's

marital status, accessibility, pregnancy-wantedness, place of delivery, residence, wealth index and ethnicity. Wealth index served as an indicator of wealth that is consistent with expenditure and income measures [32]. The index was constructed using household asset data via a principal components analysis. The household asset data were adopted from the 2013 NDHS [1].

In the binary logistic regression analysis, the response variable (PNC) was framed to rhyme with the WHO recommendations; whether the child was attended to by a qualified health care worker within 24 hours postpartum and also on days 3, 7-14 and at 6th week postpartum. Since the interest was in identifying the probabilities of facing the outcome variable, the dependent variables were coded as “1” if the event happened and coded as “0” if not. Statistical significance was determined at an alpha level of <0.05 and 95% CI for the odds ratios were equally computed.

For the qualitative aspect, data was analysed by thematically [33], allowing the data itself to suggest names for the themes [34,35].

2.8. Ethical Considerations

Approval for the research project was sought and gotten from Health Research Ethics Committee of Ahmadu Bello University Teaching Hospital, Zaria. Permission was additionally sought from the Kaduna State Ministry of Health to carry out this research in the selected LGAs. Informed consents were obtained from the participants and confidentiality was assured.

3. Results

The mean ages of the respondents were 27.0± 6.7 years and 25.5 ± 6.7 years in urban and rural settlements respectively. The largest proportion of respondents fell within the age group of 20-24 years (26.3%) and 39.0% in both urban and rural communities respectively (Table 1).

Seventy-four percent of the respondents in the urban setting utilized PNC services while 61.2% of those in the rural setting did likewise (Figure 1).

Table 1. Socio-demographic characteristics of respondents in Sabon Gari and Giwa LGAs of Kaduna State

Variables	Sabon Gari LGA Frequency (%) (n=410)	Giwa LGA Frequency (%) (n=410)	Test Statistic	
Age (years)				
15-19	49 (12.0)	72 (17.6)	$\chi^2 = 11.990$ p=0.062	
20-24	108 (26.2)	124 (30.2)		
25-29	104 (25.4)	97 (23.7)		
30-34	83 (20.2)	74 (18.0)		
35-39	47 (11.5)	31 (7.6)		
40-44	11 (2.6)	9 (2.2)		
≥45	8 (2.0)	3 (0.7)		
Mean age ±SD(years)	27.0±6.7	25.5±6.7	t=3.166; p=0.002*	
Marital status				
Married	402 (98.0)	406 (99.0)	$\chi^2 = 1.353$ p= 0.245	
Widowed	8 (2.0)	4 (1.0)		
Educational status				
None	26 (6.3)	64 (15.6)	$\chi^2 = 167.189$ p<0.0001*	
Quranic	48 (11.7)	116 (28.3)		
Primary	83 (20.2)	152 (37.1)		
Secondary	186 (45.4)	73 (17.8)		
Tertiary	67 (16.4)	5 (1.2)		
Religion				
Islam	360 (87.8)	358 (87.3)	$\chi^2 = 0.045*$ p= 0.832	
Christianity	50 (12.2)	52 (12.7)		
Main occupation				
Unemployed	147 (35.7)	128 (31.2)	$\chi^2 = 80.683$ p<0.0001*	
Farming	31 (7.6)	5 (1.2)		
Petty trading	143 (34.9)	235 (57.3)		
Artisan	18 (4.4)	26 (6.3)		
Civil servant	40 (9.8)	5 (1.3)		
Student	31 (7.6)	11 (2.7)		
Ethnicity				
Hausa	309 (75.4)	337 (82.2)		$\chi^2 = 51.981$ p<0.0001*
Fulani	51 (12.4)	72 (17.6)		
Yoruba	17 (4.1)	0 (0.0)		
Igbo	12 (2.9)	0 (0.0)		
Others	21 (5.2)	1 (0.2)		
Parity				
Primipara	85 (20.7)	55 (13.4)	$\chi^2 = 25.588$ p<0.0001*	
Multipara	265 (64.6)	239 (58.3)		
Grandmultipara	60 (14.7)	116 (28.3)		

*Statistically significant.

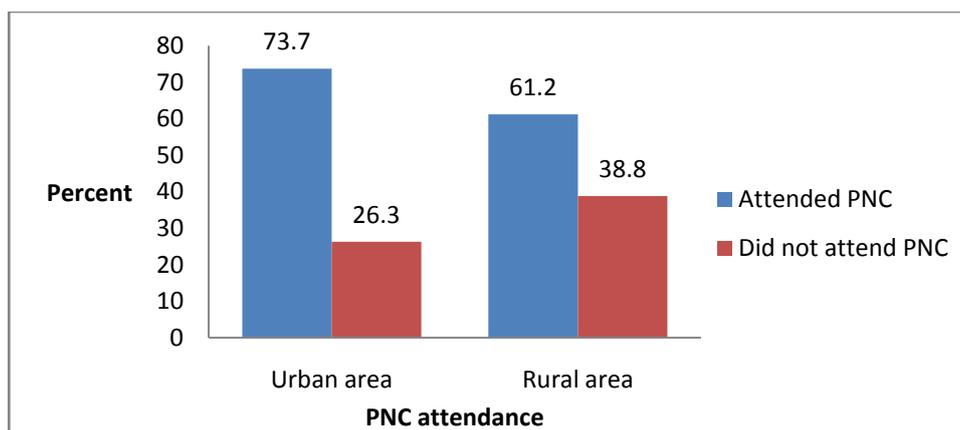


Figure 1. Postnatal care services utilization by the respondent

Table 2. Logistic regression model of the predictors of PNC services utilization in primary healthcare centres in Sabon Gari LGA of Kaduna State

Variable	AOR	95% CI		P-value
		Lower	Upper	
ANC attendance				
Yes	0.179	0.069	0.465	<0.0001
No	1.0			
Size of the baby				
Large	0.312	0.127	0.765	0.011
Small	1.0			
Wealth index				
Poorest	0.119	0.016	0.864	0.035
Poor	0.762	0.223	2.606	0.665
Middle	1.153	0.286	4.643	0.841
Rich	0.629	0.233	1.699	0.360
Richest	1.0			
Age group of mothers of the index children				
15-19	0.065	0.004	1.110	0.059
20-24	0.059	0.004	0.860	0.038
25-29	0.050	0.004	0.691	0.025
30-34	0.041	0.003	0.576	0.018
35-39	0.047	0.003	0.697	0.026
40-44	0.017	0.001	0.457	0.015
≥45	1.0			
Transportation to health facility				
Big problem	5.936	1.620	21.752	0.007
Not a big problem	1.0			

Table 3. Logistic regression model of the predictors PNC services utilization in primary healthcare centres in Giwa LGA of Kaduna State

Variable	AOR	95% CI		P-value
		Lower	Upper	
ANC attendance				
Yes	0.059	0.014	0.245	<0.0001
No	1.0			
Educational status of child's father				
None	4.801	0.381	60.423	0.225
Quranic	16.716	2.028	137.803	0.009
Primary	36.572	4.841	276.291	<0.0001
Secondary	12.509	1.856	84.293	0.009
Tertiary	1.0			
Educational status of child's mother				
None	0.013	<0.0001	0.616	0.027
Quranic	0.015	<0.0001	0.656	0.029
Primary	0.023	0.001	0.884	0.043
Secondary	0.038	0.001	1.543	0.083
Tertiary	1.0			
Hospital waiting time				
≤30 minutes	49.361	1.720	1416.503	0.023
31-60 minutes	5.428	0.202	145.957	0.313
61-120 minutes	11.905	0.675	209.979	0.091
≥121 minutes	1.0			
Family problem				
Yes	7.794	2.507	24.232	<0.0001
No	1.0			
Financial problem				
Big problem	4.051	1.517	10.818	0.044
Not a big problem	1.0			

In the urban setting, the predictors of PNC services utilization were: ANC services attendance (AOR= 0.179; 95% CI= 0.069-0.465); size of the baby (AOR= 0.312; 95% CI= 0.127-0.765); wealth status (AOR= 0.119; 95% CI= 0.016-0.864), maternal age (20-44 years) and transportation problems (AOR= 5.936; 95% CI= 1.620-21.752) (Table 2).

In the rural setting, the predictors of PNC services utilization were: ANC services attendance (AOR= 0.059; 95% CI= 0.014-0.245); paternal education; maternal education; hospital waiting time (AOR= 49.361; 95% CI= 1.720-1416.503); family problem (AOR=7.794; 95% CI=2.507-24.232) and financial problem (AOR= 4.051; 95% CI=1.517-10.818) (Table 3).

Findings of focus group discussions conducted in the urban and rural areas on factors affecting the availability and utilization of PNC services

Discussions with participants in the urban area with no formal education showed that there were different factors affecting PNC uptake. Levels of education, husbands' support, pregnancy-wantedness, marital status were among some of the factors mentioned by participants. Some of their responses were: *"Younger women go to the hospital more frequently than older ones due to the level of education of our present generation."* *"Mothers who are very educated go for postnatal check-up more than the ones that had little or no education."* A participant said that: *"Married mothers usually make use of postnatal services more than the unmarried ones as they have better family support and the baby is desired."* The participants in the rural area gave similar reasons for not using PNC services. The FGD done with participants in the urban area yielded similar results as their rural counterparts.

4. Discussion

The study showed that utilization of PNC services was 73.7% in the urban area and 61.2% in the rural area. These figures were higher than the Nigerian national urban/rural PNC utilization of 58.9% and 27.8% respectively [8]. They were also higher than the PNC services utilization figures in Kaduna State and north-western region which stood at 36.9% and 19.0% respectively [8]. These findings were also higher than had been documented from previous studies conducted in Nigeria [36,37]. We found from regression analysis that the predictors of PNC services utilization in the urban areas were: ANC services attendance, large size of the baby, poorest wealth quintile of the respondents, age (20 to 44 years) and not having transportation issues to the health facility. Some of this findings are similar to previous studies conducted in Nigeria and 15 sub-Saharan African countries [38,39]. However, in studies carried out in urban Indonesia, Bangladesh, Nepal, Ethiopia and Uganda, it was reported that female education and birth order of <5 were the major predictors of PNC utilization [26,28,29,40,41,42]. In another Ethiopian study, it was found that only educational status of the child's mother, knowledge of the importance of PNC, counseling and self-decision to use PNC services were significantly associated with PNC services utilisation [25]. The findings from our study differed from the result

of studies done in India, Tanzania, Ethiopia and Uganda that showed that hospital waiting time was a predictor of PNC services utilization [41,42].

In the rural area, the predictors of PNC services utilization were: ANC services attendance, education of fathers of index children, hospital waiting time of ≤ 30 minutes, family problems and having financial problems. Education was an important predictor of PNC utilization. It has been shown that educated parents know the benefits of maternal, neonatal and child health services and also when and where to obtain them than the less educated ones [43]. Our study also showed that respondents who had ANC from a skilled provider were more likely to utilize PNC services than those who did not. This is similar with previous findings conducted in Nigeria [36,44].

Our study highlighted the urban-rural differences in the utilization of PNC services in Kaduna State. We found different factors affecting the utilization of PNC services in both study areas. This provides information that will assist the relevant state public health policy makers to make informed decisions about the necessary interventional programs that need to be instituted to enhance PNC utilization in the urban and rural areas.

5. Conclusion

This study revealed that ANC attendance was the only common predictor of PNC utilization in both study areas. The other predictors of PNC services utilization in the urban areas were large-sized babies; wealth status; mothers' age and transportation problems, while in the rural segment, paternal education education; maternal education; hospital waiting time of ≤ 30 minutes; family problems and financial problems were the predictors of PNC services utilization. Consequently, different predictors determine the utilization of PNC services in both urban and rural areas in Kaduna State.

6. Recommendations

We recommend that the state health care authorities and relevant stakeholders should institute measures such as health educational campaigns, employment of more health workers to decrease the hospital waiting time among others, to address the different predictors of PNC services utilization in order to optimize the utilization of these services in the study areas, thereby improving the poor maternal, neonatal and child health indices in the state. These will likely lead to a reduction in maternal, neonatal and infant morbidity and mortality.

References

- [1] National Population Commission (NPC) [Nigeria] and ICF International. 2014. Nigeria Demographic and Health Survey 2013. Abuja, Nigeria, and Rockville, Maryland, USA: NPC and ICF International. 2013.
- [2] World Health Organization: WHO 2012 maternal and child health fact sheet 2012 [cited 2017 1st January]. Available from: <http://www.who.int/mediacentre/factsheets/fs348/en/>.

- [3] UNFPA 2013 fact sheet 2013 [cited 2017 1st January]. Available from: <http://www.unfpa.org/public/home/mothers/pid/4381>.
- [4] UN. The Millennium Development Goals Report 2012. New York: United Nations. 2012.
- [5] UN and African Union Commission. Report on Progress in Achieving the Millennium Development Goals in Africa, 2013. Abidjan: Côte d'Ivoire 2013 [cited 2017 5th January]. Available from: http://www.uneca.org/sites/default/files/document_files/report-on-progress-in-achieving-the-mdgs-in-africa.pdf.
- [6] WHO, UNFPA, UNICEF and World bank. Trends in maternal mortality: 1990-2010. Geneva: WHO, UNICEF, UNFPA and The World Bank estimates. 2012.
- [7] Surviving the first day. State of the world's mothers: Save the Children.; 2013 [cited 2016 18th July]. Available from: http://www.savethechildren.org/atf/cf/%7B9def2ebe-10ae-432c-9bd0-df91d2eba74a%7D/SOWM-FULL-REPORT_2013.PDF.
- [8] National Bureau of Statistics (NBS) and United Nations Children's Fund (UNICEF). Multiple Indicator Cluster Survey 2016-17, Survey Findings Report. Abuja, Nigeria: National Bureau of Statistics and United Nations Children's Fund. 2017.
- [9] WHO, UNICEF, UNFPA, World Bank Group, and United Nations Population Division Maternal Mortality Estimation Inter-Agency Group. Maternal mortality in 1990-2015. United States of America Geneva: WHO; 2015 [cited 2017 February 2nd]. Available from: http://www.who.int/gho/maternal_health/countries/usa.pdf?ua=1.
- [10] Singh PK, Kumar C, Rai RK, Singh L. Factors associated with maternal healthcare services utilization in nine high focus states in India: a multilevel analysis based on 14,385 communities in 292 districts. *Health Policy Plan.* 2014; 29(5): 542-59.
- [11] Pattinson R, Kerber K, Buchmann E, Friberg IK, Belizan M, Lansky S, et al. Stillbirths: how can health systems deliver for mothers and babies? *Lancet.* 2011; 377(9777): 1610-23.
- [12] Blank A, Prytherch H, Kaltschmidt J, Krings A, Sukums F, Mensah N, et al. Quality of prenatal and maternal care: bridging the know-do gap (QUALMAT study): an electronic clinical decision support system for rural Sub-Saharan Africa. *BMC Med Inform Decis Mak.* 2013; 13(1): 44.
- [13] World Health Organisation. Recommendations on postnatal care of the mother and newborn. WHO Geneva 2013 [cited 2017 17th May]. Available from: www.who.int/maternal_child_adolescent/documents/postnatal-care-recommendations/en/.
- [14] Giwa Local Government Area. Official health data and records. Primary Health Care Department, Giwa Local Government Council. Kaduna State, Nigeria. June. 2015.
- [15] Sabon Gari Local Government Area. Official health data and records. Primary Health Care Department, Sabon Gari Local Government Council, Sabon Gari, Kaduna State, Nigeria., June. 2015.
- [16] Turner AG. Sampling Topics for Disability Surveys. United Nations Statistics Division, Technical Notes, December. 1996.
- [17] Bierrenbach W. Calculating the sample size for surveys of the prevalence of Tuberculosis. Cambodia 2006 [cited 2016 9th October]. Available from: http://www.tbrieder.org/publications/books_english/who_prevalence_surveys.pdf.
- [18] Darega B, Dida N, Tafese F, Ololo S. Institutional delivery and postnatal care services utilizations in Abuna Gindeberet District, West Shewa, Oromiya Region, Central Ethiopia: A Community-based cross-sectional study. *BMC Pregnancy and Childbirth.* 2016; 16(149).
- [19] Takai IU, Dlakwa HD, Bukar M, Audu BM, Kwayabura AS. Takai IU, Dlakwa HD, Bukar M, Audu BM, Kwayabura AS. Factors responsible for under-utilization of postnatal care services in Maiduguri, north-eastern Nigeria *Sahel Medical Journal.* 2015; 18(3): 109-15.
- [20] Bhattacharjee S, Datta S, Saha JB, Chakraborty M. Bhattacharjee S, Datta S, Saha JB, Chakraborty M. Maternal Health Care Services Utilization in Tea Gardens of Darjeeling, India. *J of Basic and Clinical Reproductive Sciences.* 2013; 2(2): 1-9.
- [21] Workneh YG, Hailu DA. Workneh YG, Hailu DA. Factors affecting utilization of postnatal care service in Jabitena district, Amhara region, Ethiopia. *Science Journal of Public Health.* 2014; 2(3): 169-76.
- [22] Belachew T, Taye A, Belachew T. Postnatal Care Service Utilization and Associated Factors among Mothers in Lemo Woreda, Ethiopia *Journal of Womens Health Care.* 2016; 5(3): 318.
- [23] Berhanu S, Asefa Y, Giru BW. Prevalence of Postnatal Care Utilization and Associated Factors among Women Who Gave Birth and Attending Immunization Clinic in Selected Government Health Centers in Addis Ababa, Ethiopia. *Journal of Health, Medicine and Nursing.* 2016; 26: 1-15.
- [24] Limenih MA, Endale ZM, Dachew BA. Postnatal Care Service Utilization and Associated Factors among Women Who Gave Birth in the Last 12 Months prior to the Study in Debre Markos Town, Northwestern Ethiopia: A Community-Based Cross-Sectional Study. *International Journal of Reproductive Medicine.* 2016; 2016(7).
- [25] Alemayeh H, Assefa H, Adama Y. Prevalence and Factors Associated with Postnatal Care Utilization in Abi-Adi Town, Tigray, Ethiopia: A Cross-Sectional Study. *International Journal of Pharmaceutical and Biological Sciences Fundamentals.* 2014; 8(8): 1-13.
- [26] Titaley CR, Hunter CL, Heywood P, Dibley MJ. Why don't some women attend antenatal and postnatal care services?: a qualitative study of community members' perspectives in Garut, Sukabumi and Ciarni districts of West Java Province, Indonesia. *BMC Pregnancy and Childbirth.* 2010; 10(61): 1-12.
- [27] Chi PC, Bulage P, Urdal H, Sundby J. A qualitative study exploring the determinants of maternal health service uptake in post-conflict Burundi and Northern Uganda. *BMC Pregnancy and Childbirth.* 2015; 15(18): 1-14.
- [28] Adhikari R. Effect of Women's autonomy on maternal health service utilization in Nepal: a cross sectional study *BMC Women's Health.* 2016; 16(26): 1-7.
- [29] Rahman M. The determinants of use of postnatal care services for Mothers: does differential exists between urban and rural areas in Bangladesh? *The Internet Journal of Epidemiology.* 2009; 8(1): 1-6.
- [30] Royal government of Cambodia, the kingdom of Cambodia. Early postnatal care and its determinants in Cambodia. Further analysis of Cambodia demographic and health survey Phnom Penh -April, 2013 [cited 2016 17th November]. Available from: <https://dhsprogram.com/pubs/pdf/fr312/fr312.pdf>.
- [31] Sun G, Shook TL, Kay GL. Inappropriate use of bivariate analysis to screen risk factors for use in multivariable analysis. *J Clin Epidemiol.* 1996; 49: 907-16.
- [32] Rutstein S. Wealth versus expenditure: Comparison between the DHS wealth index and household expenditures in four departments of Guatemala. Calverton, Maryland, USA: ORC Macro. 1999.
- [33] Campbell R, Schram PJ. Feminist research methods: A content analysis of psychology and social textbooks. *Psychology of Women Quarterly.* 1995; 19(1): 85-106.
- [34] Kissling EA. Kissling EA. Bleeding out loud: Communication about menstruation. *Feminism & Psychology.* 1996; 6(4): 481-504.
- [35] Breakwell GM, Hammond S, Fife-Schaw C. Research methods in psychology. *Journal of Environmental Psychology.* 1994; 14(4): 335.
- [36] Ugboaja JO, Berthrand NO, Igwegbe AO, Obi-Nwosu AL. Barriers to postnatal care and exclusive breastfeeding among urbanwomen in southeastern Nigeria. *Nigerian Medical Journal.* 2013; 54(1): 45-50.
- [37] Babalola S, Fatusi A. Determinants of use of maternal health services in Nigeria - looking beyond individual and household factors. *BMC Pregnancy and Childbirth.* 2009; 9(43).
- [38] Fotso JC. Urban-rural differentials in child malnutrition: trends and socioeconomic correlates in sub-Saharan Africa. *Health Place.* 2007; 13(1): 205-23.
- [39] Stock R. Distance and the utilization of health facilities in rural Nigeria. *Soc Sci Med.* 1983; 17(9): 563-70.
- [40] Mehari K, Wencheke E. Factors affecting maternal health care services utilisation in rural Ethiopia: a study based on the 2011 EDHS data. *Ethiop J health dev.* 2013; 27(1): 16-24.
- [41] Tarekegn SM, Lieberman LS, Giedraitis V. Determinants of maternal health service utilization in Ethiopia: analysis of the 2011 Ethiopian Demographic and Health Survey. *BMC Pregnancy and Childbirth.* 2014; 14(161): 1-13.
- [42] Rutaremwa G, Wandera SO, Jhamba T, Akiror E, Kiconco A. Determinants of maternal health services utilization in Uganda. *BMC Health Services Research.* 2015; 15(271): 1-8.
- [43] Raghupathy S. Education and the use of maternal health care in Thailand. *Soc Sci Med.* 1996; 43(4): 459-71.

- [44] Rai RK, Singh PK, Singh L. Utilization of maternal health care services among married adolescent women: insights from the Nigeria Demographic and Health Survey, 2008. *Women's Health Issues*. 2012; 22(4): 407-14.



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