

Journal of Medicine, Nursing & Public Health



ISSN Online 2706 - 6606



**An assessment of knowledge, utilization, and perceptions on
antenatal care services among women in Nimba County,
Liberia**

**Edwina Smythe, Prof. Ephantus Kabiru & Dr. Justus O.S.
Osero**

ISSN: 2706-6606

An assessment of knowledge, utilization, and perceptions on antenatal care services among women in Nimba County, Liberia

¹*Edwina Smythe, ²Prof. Ephantus Kabiru & ³Dr. Justus O.S. Osero

¹Department of Community Health and Epidemiology, Kenyatta University

^{2,3} Department of Community Health and Epidemiology, Kenyatta University

*Email of Corresponding Author: smytheadwina537@gmail.com

How to cite this article: Smythe, E., Kabiru, E., & Osero, J. (2022). An assessment of knowledge, utilization, and perceptions on antenatal care services among women in Nimba County, Liberia. *Journal of Medicine, Nursing & Public Health*, 5(2), 39-51. <https://doi.org/10.53819/81018102t6021>

Abstract

Liberia registers an exponential mortality rate in developing Sub-Saharan countries in Africa. Inadequate utilization of antenatal care is a leading cause of the higher infant mortality rates recorded in Liberia. Thus, this study seeks to assess knowledge and socio-demographic factors that thwart the utilization of ANC services among women between 15 and 49 years in Nimba County, Liberia. The study applied quantitative and qualitative research design. A sample of 167 was selected using a systematic sampling technique. The SPSS Software Version 23.0 was used to analyze the data collected statistically. Results indicated that 54.5 % of the sample were between 15 – 25 years. Socio-demographic characteristics such as age ($\chi^2=0.902$, $df=3$, $P=0.825$), were not significant with ANC attendance and the level of knowledge was significant ($\chi^2=5.653$ $df=1$ $P=0.017$). Further, 150 women in the sample had adequate knowledge of ANC services. The high level of knowledge among respondents was significant ($\chi^2=5.653$ $df=1$ $P=0.017$) with ANC attendance. In addition, 83.8% attended ANC services, and 77.8% delivered their babies at health centres. One of the noticeable challenges cited by respondents in this study was the distance to facilities with 64%. Most people were knowledgeable about ANC services, which affected their decision to utilize ANC services, while demographic factors were not significant. However, the study has established inadequate medication and distance to the nearest facility foiled the utilization of ANC services. Therefore, this study recommends that the government ensures that rural Liberia's health facilities are equipped with medicines and accessible and aggressively conducts civic education or campaigns to create awareness about the ANC services.

Keywords: *Antenatal care, pregnancy, health workers*

<https://doi.org/10.53819/81018102t6021>

1.0 Background of the Study

Maternal health is among the new objectives of Healthy People 2020. It is now 2019, and a significant number of countries continue to struggle with providing quality maternal health. At least 800 women die daily due to causes related to pregnancy and childbirth, with about 99% occurring in developing countries,[1]. Also, at least 78% of all successful births happen with a skilled health care practitioner,[2].

Despite increased global interest in maternal wellness since the launch of the Safe Motherhood Initiative over 30 years ago, one woman dies every minute and 45s from pregnancy-related factors, [3]. Most of these death cases are related to the underutilization of ANC services and giving birth at home with no or minimal help from midwives. The main reason for this underutilization is poverty issues devastating citizens to meet the ANC service costs involved. The Sustainable Development Goals aimed at a global ratio of maternal deaths of no more than 70 per 100,000 live births by 2030. According to the findings report by UN Women, the Maternal Mortality rate in Liberia counts up to 1,072 per 100,000 births [4]. WHO suggests that all pregnant women must obtain Antenatal treatment services at least four times for the duration of the pregnancy, [2]. The primary reason for ANC services is to guarantee that the pregnancy or childbirth process does not cause any harm to either the mother or the baby. This means that without antenatal care services, the mother and the infant are at a heightened risk of mortality and morbidity. There are 33% of Pregnant women who received ANC visits, a conservative estimate of four times in Nimba, which is considerably lower than the national rate of 78% [5]. Expecting mothers that obtained ANC a minimum of one visit from a skilled provider in Nimba is 38%, while the National rate of at least one check out from an experienced provider is 96%, [6].

52% of pregnant women in Nimba deliver at home, and 48% give birth at the facility. The national home delivery rate is 25.4%, and facilities delivery is 74.6%, [7]. Some reasons for this include an intention to give birth naturally without needing ANC service, labor inducement due to a very high cost of medications, and the long distance to maternal care facilities. Additionally, some women believe they want autonomy and control during childbirth, some because of religious beliefs and cultural norms [8]. This therefore called for efforts to assess the knowledge, utilization, and perceptions of ANC services in rural Nimba County, Liberia. The study sought to answer the following questions:

- i. What are the socio-demographic characteristics associated with Antenatal care services among women reproductive-aged 15 to 49 years in Nimba County?
- ii. What is the level of knowledge on antenatal care services in Nimba County among women aged 15 to 49 years?

Demographic and social factors

a) Age

Results from South-East Nigeria revealed that rural women reported socio-demographic variables, such as cultural, religious, and age. The main issues that affected women's utilization of the ANC maternal health facilities available, the scheduling of ANC bookings, and the number of ANC

attendance [8]. According to Lori et al. (2017), the cultural beliefs of women in Liberia were a decisive factor that misled most women into taking time to attend the ANC services during pregnancy periods [9]. Shrestha's (2018) study in Nepal showed that a woman's probability of attending ANC is influenced by various factors, including social diversity, low literacy, economic status, distance to the facilities, and family income, which contribute to significant disparities in ease of access and utilization even when women are given elevated services [10]. Age was another known socio-demographic factor that affects access to antenatal care services. Adolescent mothers postpone their antenatal care services for longer, given their fear of stigmatization. This consequently ends up causing them pregnancy complications and, at times, death [11]. These mothers may also take longer to come to terms with the reality of their condition. Age was strongly correlated with ANC utilization in cross-sectional descriptive research done in Central Nepal [12]. However, this study was based on "secondary data using a nationally representative sample survey" Therefore, this study hypothesized that there was no significant relationship between socio-demographic variables and ANC services among women of reproductive-aged 15 to 49 years in Nimba County.

b) Education

The women's education status significantly affects their antenatal care utilization, with higher levels recorded amongst women with a higher economic status, [13]. This could be due to the various tangible and perceived costs of antenatal care services. In western Ethiopia, a study carried out in the region of Benishangul Gumuz showed that educational status was a key factor affecting ANC utilization, [14]. Educated women use ANC early and recommended times compared to their uneducated counterparts. The educated women also tend to deliver in the hands of healthcare providers at facilities.

c) Knowledge of Antenatal care services

The level of knowledge is an essential factor in any context regarding utilization. People cannot use a service if they are unaware of its value. When it comes to antenatal care services, women in rural areas may not be adequately informed, given their reliance on traditional medicine. Common issues hindering women's knowledge of ANC services include their education, socio-economic status, autonomy, and exposure level [15]. Women in rural areas have less exposure to the media and diverse socio-cultural composition, so they have less knowledge than their urban counterparts [16]. These women are limited to cultural practices and often distorted information from their more exposed peers. Another significant issue with antenatal care service knowledge is that many women learn from their peers and health workers, making these the most important sources of knowledge. However, their peers' information may not always be as accurate as what they can learn about their health and pregnancy status from the health workers. Knowledge increases the woman's interest in antenatal care, thus increasing the likelihood of getting ANC services during pregnancy. Therefore, the study deduced hypothesis 2. There is no significant relationship between knowledge level and ANC services among women of reproductive age 15-49 years in Nimba County, as summarized in figure 1 below.

<https://doi.org/10.53819/81018102t6021>

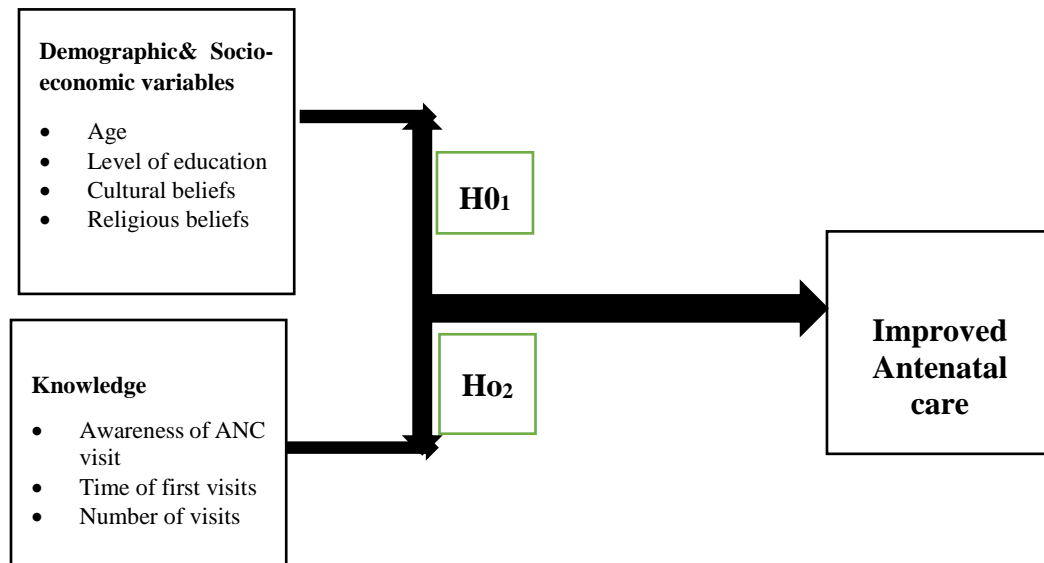


Figure 1: Conceptual Framework (Self, 2020)

3.0 Methodology

The study implemented a cross-sectional analytical study design to assess knowledge, utilization, and perceptions of ANC services among women aged 15-49 years in Nimba County, Liberia. The research utilized a combination of qualitative and quantitative methods of collecting data to better understand the research questions being considered.

The research was done in Nimba County, one of the largest of Liberia's 15 counties in terms of population. The County has a population of 462,026, [17]. The County has six statutory districts, which are as follows: Gbehlay-Geh, SanniquellieMahn, Saclepea, Tappita, Yarwein-Mehnonoh, and Zoegeh. The County has seven health facilities: George Way Harley Memorial Hospital, Sanniquellie, Nimba County, Ganta, G.W. Harley Memorial Hospital, Ganta United Methodist Hospital, Saclepea Comprehensive Health Center Saclepea, Saniquelleh, Zoe Geh Medical Center, E&J Hospital. The study was conducted in two purposively selected districts, SanniquellieMahn and Gbehlay-Geh. SanniquellieMahn is comprised of 11 villages and 3693 households, while Gbehlay-Geh has 18 villages and 4740 households. The two districts had a population of approximately 29,351, [18].

Sampling Techniques

One hundred sixty-seven (167) respondents were chosen for quantitative data to participate in this study. Nimba County got purposefully selected as the research region due to its persistently low ANC visit rate of 33%, [19]. SanniquellieMahn and Gbehlay-Geh were purposefully selected as the two central districts in Nimba County. Six (6) and nine (9) villages were chosen at random from a list of twenty-nine (29) villages. This was from each of the two districts for 15 villages in SanniquellieMahn and Gbehlay-Geh. Using systematic sampling, households were drawn

<https://doi.org/10.53819/81018102t6021>

randomly from the relevant household listing in each community. The 15 villages had a total of 6,011 homes. A sampling interval of 35 was used to choose the households to participate in the study ($6,011/167 = 35$). A total of 167 homes were selected to participate in the research (Appendix V). One woman of reproductive age (15-49 years) got chosen from each household to participate in the study. The researcher used a purposive sampling strategy for qualitative data to pick participants for FGDs. Inclusion criteria; all women of reproductive age residing in SanniquellieMahn and Gbehlay-Geh districts, Nimba County. Exclusion criteria; women aged 15 to 49 years, sick and unable to talk, were excluded from participating in this study.

Sample Size Determination

The Sampling size determination was based on Fisher's sampling formula calculated at a 95% confidence interval [20]. The prevalence of four antenatal visits amongst respondents in Nimba County got estimated at 33%.

$$n = \left[z^2 \times \frac{p \times q}{d^2} \right]$$

Where: n = sample size
 z = at 95% confidence interval (1.96)
 p = probable prevalence 33 % (0.33)
 q = 1- p (1-0.33) d = preferred precision (5%)

Therefore, $n = (1.96)^2 \times 0.33(1-0.33)/0.05(2)$

$n = 3.8416 \times 0.1089/0.0025$

$n = 167$

The minimum sample size required was 167. The questionnaire covered demographic data and the participants' experiences related to antenatal care services. The researcher conducted two (2) FGDs comprising women aged 15-49 years to obtain information on their knowledge of Antenatal care services. Each group consisted of 12 participants. The study's time frame and budgetary resources determined the number of focus groups. The Key Informant Interviews (KIIs) were performed with facility staff and community leaders. Collected data was put into a Microsoft Excel spreadsheet and double-checked for correctness. To create a clean dataset, all data entries were re-checked with the original data types before being transferred into SPSS version 23.0 to permit data cleaning and analysis. Categorical variables were analyzed through descriptive statistics (frequency and percentages). The strength of the relationship among categorical variables, for example, age, level of education, marital status, and residential area, was calculated using Pearson's Chi-square test. P-values lower than 0.05 were considered statistically significant. Qualitative data were first categorized into crucial research themes and then analyzed using descriptive statistics.

Research Ethics Approval

The study got approval from the Kenyatta University graduate school upon reviewing and approving the proposal (Appendix I). It permitted the author to seek approval from the National

<https://doi.org/10.53819/81018102t6021>

Commission For Science, Technology, and Innovation (NACOSTI). NACOSTI approved the proposal and was allowed to conduct research (Appendix II). The researcher sought study approval from Liberia’s National Research Ethics Board (Appendix III). Clearance to collect data was obtained from the County Health Officer and the District Health Coordinator in Nimba County. The study recruited study participants who provided written and verbal consent before enrollment. Participation was optional, and strict confidentiality was ensured and maintained during and after data collection. Respondents were not coerced to give information but participated voluntarily, [21]. Women under the age of 18 who were pregnant obtained consent from their parents or guardians, and the respondents gave assent. Women who were pregnant, above 18 years, and living with parents or guardians were asked for consent before the data collection process commenced.

4.0 Results

Demographic information

a) Age

Results from the survey indicate that 54.5 % of the respondents were aged between 15- 25. Those aged 26 -35 were 34.1 %, and 8.4 % were between 36- 45. Those aged 46-49 were only 3.0 %, as seen in Table 1.

Table 1: Age of the respondents

Variable	Frequency (n=167)	Percent (%)
Age	15-25	91
	26-35	57
	36-45	14
	46-49	5
Total	167	100

e) Education

The respondents had attained various levels of education, with only 1.2 % having earned a bachelor’s degree with the majority, 36.5 % having no formal education, followed by those who had attained High school 58 (34.7 %), as seen in Table 2.

Table 2: Level of Education among the Respondents

Variable	Frequency (n=167)	Percent (%)
Education	Bachelor’s degree	2
	High School	58
	Elementary	46
	No formal Education	61
Total	167	

4.2 Association between Socio-Demographic Characteristics and ANC attendance

Socio-demographic Characteristics shown in Table 3 were cross-tabulated with antenatal care attendance. The findings show no significant link between women of reproductive age and education.

Table 3: Association between Socio-Demographic Characteristics and ANC attendance

		Attended		Not-Attended		Chi-square	df	P-value
		n	(%)	n	(%)	χ^2	df	(<0.05)
Age	15-25	82	49.9	9	5.4	$\chi^2 = 0.902$	df= 3	P= 0.825
	26-35	54	32.3	4	2.4			
	36-45	12	7.2	1	0.6			
	46-49	5	3.0	0	0.0			
Education	Bachelor degree	2	1.2	0	0.0	$\chi^2 = 0.339$	df= 1	P= 0.561
	High School	46	27.5	4	2.4			
	Elementary	54	32.3	6	3.6	$\chi^2 = 0.485$	df= 3	P= 0.922
	No formal education	51	30.5	4	2.4			

4.3 Level of Knowledge regarding Antenatal Care

The results showed that 84.4% of women knew that antenatal care clinics are necessary between 0-3 pregnancy months. In addition, 82.0 % of women agreed that women require at least 4 ANC visits for the entire pregnancy period. Results also showed that 93.4 % of women had the knowledge that women should deliver in healthcare facilities, while only 6.6 % said that women should give birth at home, as seen in Table 4.

Table 4: Level of Knowledge regarding Antenatal Care

Variable		Frequency (n=167)	Per cent (%)
Is ANC necessary during the first three months?	Yes	141	84.4
	No	26	15.6
Do women require at least four ANC checkups	Yes	137	82.0
	No	30	18.0
Where should a pregnant woman deliver her baby?	Health facility	156	93.4
	Home	11	6.6
Are you aware that infection without attending ANC visits causes harm to the baby?	Yes	137	82.0
	No	30	18.0

4.3.1 Overall level of knowledge of ANC among respondents

Four questions were used to check the overall knowledge level about ANC. Each question received a '1' mark for a correct response and a 0 for an erroneous response. The total marks obtained by respondents on Antenatal care knowledge were calculated by adding their scores. Respondents with three out of four points were judged to have sufficient knowledge, while those with one out of four were considered inadequate. As shown in figure 2, 150 (89.8 percent) of these respondents had adequate knowledge, whereas just 17 (10.2 percent) of these respondents reported a poor understanding of antenatal care.

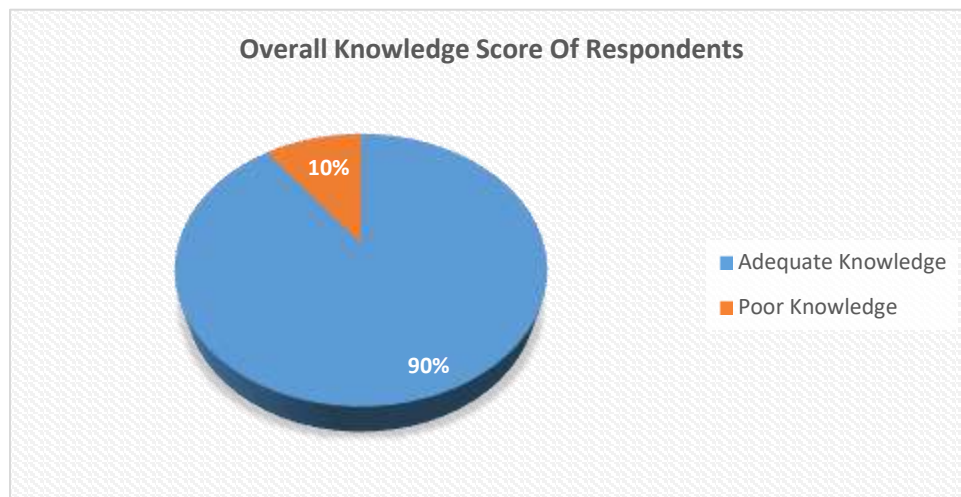


Figure 2: Overall level of Knowledge score of Antenatal care

4.3.2 Association between the level of Knowledge and ANC attendance

The level of knowledge ($\chi^2=5.653$ df=1 P=0.017) was statistically significant with ANC attendance, as seen in Table 5.

Table 5: Association between the level of Knowledge of Antenatal care and ANC attendance.

		Attended		Not-Attended		Significance
		N	(%)	N	(%)	
Knowledge Level`	Adequate	140	83.8	10	7.8	$\chi^2=5.653$ df=1 P=0.017*
	Poor	13	6.0	4	2.4	

*Statistically highly significant at p<0.01

5.0 Discussion

Socio-demographics characteristics of respondents

Results indicated that most (54.5 %) females were between 15 and 25. The majority of them attended more ANC visits than other female participants between 36-45. Young age was likely to influence ANC utilization as it is the most fertile stage in the life of a woman, [22]. This agrees with a UNICEF report showing that the percentage of women aged between 15- 49 attending ANC visits increased to 85 % globally and 77 % in developing countries between 2010 and 2015. This included at least one ANC visit and being attended by a skilled health care provider, [23, 6]. However, the age of respondents was not significantly associated with the utilization of ANC in our study. This contradicts research among newly delivered mothers in Rwanda and women under the age of five in Ghana, [24, 25]. The results showed that just 34.7% of those interviewed had attained a secondary educational level, with 36.5% having no formal education.

The level of education attained did not influence whether or not the women of Nimba County accessed ANC services. This was contrary to results obtained by Mourtada in 2019 in Syria who, through quantitative analysis, demonstrated that the level of education obtained by women was an essential determinant in ANC utilization studies, [26]. Additionally, educational status was not significantly related to ANC utilization.

Knowledge level among reproductive-age women

The results showed that 150 (90%) women who participated in this study had adequate knowledge of antenatal care services. The study outcomes revealed that women in Nimba county, Liberia gained knowledge about using ANC service from peers, friends, and the various government campaigns. This outcome is more than the results obtained in Nigeria and Ghana in 2013 and 2020, respectively, where 69.9% and 79% of the women were knowledgeable about the activities undertaken in providing ANC services, [27, 28]. This was contrary to findings in Southwestern Nigeria, where 56.4% had a moderate knowledge level concerning ANC attendance, [29]. A quantitative cross-sectional study done among pregnant women aged 20 to 45 in Rural Lahore Area found that 64.7% of pregnant women were knowledgeable about antenatal care, [30]. The level of knowledge was statistically significant in relation to attending ANC ($P=0.017^*$; **Table 5**). This concurs with a Ghanaian study in Sunyani Municipality among women having children below five years, where knowledge was shown to significantly influence attendance of ANC services, [31].

6.0 Conclusion

From the findings, it can be concluded that socio-demographic characteristics did not influence attendance of ANC. Age level of the level of knowledge was associated statistically with attending ANC. Most of the women in this study had adequate knowledge, and the level of knowledge played a pivotal role in ANC attendance. Despite most women citing that the health centres were 5km and beyond, the proportion of women attending ANC and giving birth in a health facility was high. The majority of the women perception in this study believe that healthcare in Nimba County has dramatically improved. However, there were poor services, lack of medication was reported. This

implies that when intensely educated about the value of attending ANC in rural areas in developing countries, it can significantly reduce pregnancy cases' mortality rate.

REFERENCES

1. WHO. (2019). *Maternal mortality*. Retrieved 13 December 2019, from <https://www.who.int/en/news-room/fact-sheets/detail/maternal-mortality>
2. WHO. (2018). *WHO recommendations on antenatal care for a positive pregnancy experience*. Retrieved 13 December 2019, from <https://apps.who.int/iris/bitstream/handle/10665/259947/WHO-RHR-18.02-eng.pdf>
3. WHO (2015b). Trends in Maternal Mortality: 1990-2015. Retrieved 13 December 2019, from <https://openknowledge.worldbank.org/handle/10986/23550>
4. UN Women. (2017). *Maternal health gets a new boost in Liberia*. Retrieved 13 December 2019 from <http://www.unwomen.org/en/news/stories/2017/7/feature-maternal-health-gets-a-new-boost-in-liberia>
5. Yaya, S., Uthman, O., Bishwajit, G., & Ekholuenetale, M. (2019). Maternal health care service utilization in post-war Liberia: analysis of nationally representative cross-sectional household surveys. *BMC Public Health*, 19(1), 1-12. <https://doi.org/10.1186/s12889-018-6365-x>
6. Kentoffio, K., Kraemer, J., Griffiths, T., Kenny, A., Panjabi, R., & Sechler, G. et al. (2016). Charting health system reconstruction in post-war Liberia: a comparison of rural vs. remote healthcare utilization. *BMC Health Services Research*, 16(1), 1-9. <https://doi.org/10.1186/s12913-016-1709-7>
7. Lori, J., Perosky, J., Rominski, S., Munro-Kramer, M., Cooper, F., & Kofa, A. et al. (2020). Maternity waiting homes in Liberia: Results of a countrywide multi-sector scale-up. *PLOS ONE*, 15(6), 1-14. <https://doi.org/10.1371/journal.pone.0234785>
8. Lori, J., Munro-Kramer, M., Shifman, J., Amarah, P., & Williams, G. (2017). Patient Satisfaction With Maternity Waiting Homes in Liberia: A Case Study During the Ebola Outbreak. *Journal Of Midwifery & Women's Health*, 62(2), 163-171. <https://doi.org/10.1111/jmwh.12600>

<https://doi.org/10.53819/81018102t6021>

9. Onyeonoro, U., Ukegbu, A., Emelumadu, O., Ezeama, N., Kanu, O., & Ifeadike, C. (2014). Socio-demographic determinants of maternal healthcare service utilization among rural women in Anambra State, southeast Nigeria. *Annals of Medical and Health Sciences Research*, 4(3), 374. <https://doi.org/10.4103/2141-9248.133463>
10. Shrestha, B. (2018). Mother's Education and Antenatal Care Visits in Nepal. *Tribhuvan University Journal*, 32(2), 153-164. <https://doi.org/10.3126/tuj.v32i2.24712>
11. Agunbiade, O. (2014). Sexual Exploitations, Concealment and Adolescent Mothers' Agency in a Semiurban Community in Southwest Nigeria. *Journal of Applied Social Science*, 8(1), 24-40. <https://doi.org/10.1177/1936724412475139>
12. Pandey, S. (2013). Socio-economic and Demographic Determinants of Antenatal Care Services Utilization in Central Nepal. *International Journal Of MCH And AIDS (IJMA)*, 2(2). <https://doi.org/10.21106/ijma.27>
13. Gitonga, E. (2017). Determinants of focused antenatal care uptake among women in TharakaNithi County, Kenya. *Advances in Public Health*, 2017, 1-4. doi: 10.1155/2017/3685401
14. Lori, J., Munro, M., Rominski, S., Williams, G., Dahn, B., & Boyd, C. et al. (2013). Maternity waiting homes and traditional midwives in rural Liberia. *International Journal Of Gynecology & Obstetrics*, 123(2), 114-118. <https://doi.org/10.1016/j.ijgo.2013.05.024>
15. Tiruaynet, K., & Muchie, K. F. (2019). Determinants of utilization of antenatal care services in Benishangul Gumuz Region, Western Ethiopia: a study based on demographic and health survey. *BMC Pregnancy and Childbirth*, 19(1), 115. <https://doi.org/10.1186/s12884-019-2259-x>
16. Deo, K., Paudel, Y., Khatri, R., Bhaskar, R., Paudel, R., Mehata, S., & Wagle, R. (2015). Barriers to Utilization of Antenatal Care Services in Eastern Nepal. *Frontiers in Public Health*, 3, 197-219. doi: 10.3389/fpubh.2015.00197
17. Ochako, R., & Gichuhi, W. (2016). Pregnancy wantedness, frequency and timing of antenatal care visit among women of childbearing age in Kenya. *Reproductive Health*, 13(1), 7-14. doi: 10.1186/s12978-016-0168-2

<https://doi.org/10.53819/81018102t6021>

18. Ministry of Health (2014). *Republic of Liberia Ministry of Health and Social Welfare, "Ministry of Health and Social Welfare Annual*. Retrieved 4 January 2021 from http://www.mohsw.gov.lr/documents/MOHSW%20Annual%20Report%202014_Revise.pdf.
19. Blackstone, S. (2019). Evaluating antenatal care in Liberia: evidence from the demographic and health survey. *Women & Health*, 59(10), 1141-1154. <https://doi.org/10.1080/03630242.2019.1590496>
20. LISGIS.(2008), *Liberia Institute of Statistics and Geo-Information Service. Government Of The Republic Of Liberia 2008 National Population And Housing Census*, retrieved from https://www.emansion.gov.lr/doc/census_2008provisionalresults.pdf
21. Charan, J., & Biswas, T. (2013). How to Calculate Sample Size for Different Study Designs in Medical Research?. *Indian Journal Of Psychological Medicine*, 35(2), 121-126. <https://doi.org/10.4103/0253-7176.116232>
22. Mugenda, O. M., & Mugenda, A. G. (2003). *Research methods: Quantitative and Qualitative Approaches*. Nairobi: Acts Press
23. Mathe, M. (2017). Socio-demographic factors affecting utilization of Antenatal Care Services in Botswana. *International Journal Of Academic Research In Business And Social Sciences*, 7(9). <https://doi.org/10.6007/ijarbss/v7-i9/3343>
24. UNICEF (2017). UNICEF data: monitoring the situation of children and women. Reviewed 17 January 2021 from <https://www.medbox.org/document/unicef-data-monitoring-the-situation-of-children-and-women-lesotho#GO>
25. Rurangirwa, A., Mogren, I., Nyirazinyoye, L., Ntaganira, J., & Krantz, G. (2017). Determinants of poor utilization of antenatal care services among recently delivered women in Rwanda; a population-based study. *BMC Pregnancy And Childbirth*, 17(1). <https://doi.org/10.1186/s12884-017-13>
26. Mourtada, R. Bottomley, C. Houben, F. Bashour, H. Campbell, O. (2019). A mixed-methods analysis of factors affecting antenatal care content: A Syrian case study. *PLoS ONE* 14(3). DOI: 10.1371/journal.pone.0214375

<https://doi.org/10.53819/81018102t6021>

27. Owusu, S. (2021). Factors associated with antenatal care service utilization among women with children under five years in Sunyani Municipality, Ghana. <https://doi.org/10.1101/2021.02.27.21252585>
28. Kr, A., Io, M., Oa, A., & Oa, B. (2013). Knowledge and Utilization of Antenatal Care Services by Women of Child-Bearing Age in Ilorin-East Local Government Area, North Central Nigeria. *International Journal of Science and Technology* 3(3).
29. Afaya, A., Azongo, T. B., Dzomeku, V. M., Afaya, R. A., Salia, S. M., Adatar, P., Kaba Alhassan, R., Amponsah, A. K., Atakro, C. A., Adadem, D., Asiedu, E. O., Amuna, P., & Amogre Ayanore, M. (2020). Women's knowledge and associated factors regarding optimum utilization of antenatal care in rural Ghana: A cross-sectional study. *PloS one*, 15(7). <https://doi.org/10.1371/journal.pone.0234575>
30. Ogunba, B. O., & Abiodun, O. B. (2017). Knowledge and Attitude of Women and Its Influence on Antenatal Care Attendance in Southwestern Nigeria. *J Nutr Health Sci*, 4(2), 207. www.annexpublishers.com
31. Akhtar, S., Hussain, M., Majeed, I., & Afzal, M. (2018). Knowledge Attitude and Practice Regarding Antenatal Care among Pregnant Women in Rural Areas of Lahore. *International Journal of Social Sciences and Management*, 5(3), 155–162.