FACTORS INFLUENCING UTILISATION OF ANTENATAL SERVICES TO IMPROVE LIVELIHOOD AMONG PREGNANT FEMALES OF REPRODUCTIVE AGE ATTENDING MUHOZA HEALTH CENTER IN MUSANZE DISTRICT

Jean d' Amour HABUMUGISHA[*1], Maurice B. Silali[2]

Mount Kenya University, Department of Public Health

Abstract: Background: Adequate antenatal care (ANC) is crucial for reducing maternal and neonatal morbidity and mortality. Identifying utilization patterns and associated factors informs targeted interventions to improve maternal health outcomes. This study assessed the prevalence of ANC utilization and identified demographic, accessibility, sociocultural, and knowledge-related factors influencing completion of at least four ANC visits among pregnant women attending Muhoza Health Center, Rwanda.

Methods: A facility-based cross-sectional study was conducted among 427 pregnant women using structured questionnaires. Data were analyzed using descriptive statistics and Chi-square (χ^2) tests, with significance set at $p<0.05$.

Results: The prevalence of completing ≥ 4 ANC visits was 91%. Utilization was significantly associated with age (χ^2=56.18, $p<0.01$), education level (χ^2=63.34, $p<0.01$), marital status (χ^2=145.72, $p<0.01$), and occupation (χ^2=30.23, $p<0.01$). Accessibility factors, including pregnancy type (χ^2=37.10, $p<0.01$) and waiting time (χ^2=68.94, $p<0.01$), were significant predictors, while booking trimester and health insurance showed no significant effect. Trust in health workers (χ^2=91.21, $p<0.01$), knowledge of ANC visits (χ^2=163.37, $p<0.01$), and knowledge of optimal booking time (χ^2=75.24, $p<0.01$) strongly influenced attendance. Religion and household decision-making were not significantly associated ($p>0.05$).

Conclusion: ANC utilization at Muhoza Health Center exceeded national averages. Demographic factors, accessibility, trust, and knowledge significantly influenced attendance. Interventions should focus on younger, less-educated, and other lower-utilization groups, enhancing education, accessibility, and trust to ensure equitable maternal health service coverage.

Keywords: Antenatal care, Utilization, Maternal health, Rwanda, Knowledge and attitudes.

1. INTRODUCTION

Antenatal care (ANC) is a critical intervention in maternal and child health, providing pregnant women with preventive, diagnostic, and counseling services to improve outcomes for both mother and baby. Regular ANC visits enable early detection and management of complications, promote maternal nutrition, and encourage skilled birth attendance, reducing maternal and neonatal morbidity and mortality (Dusingizimana et al., 2023). Globally, about 90% of women attend at least

one ANC visit, yet only 57% complete four or more visits. In sub-Saharan Africa, coverage is lower, with 53% attending at least one visit and 49% completing four or more (Tengera et al., 2023). First-trimester attendance varies widely, from 11% in Ethiopia to 77% in the Niger Delta, and overall quality and utilization of ANC remain low across East Africa (Harindimana, 2019; Mutowo et al., 2021).

In Rwanda, 98% of women receive at least one ANC visit from a skilled provider, but only 47% complete the recommended four visits, and the maternal mortality ratio remains high at 203 deaths per 100,000 live births (NISR & MOH, 2020). WHO now recommends eight ANC contacts starting within the first 12 weeks of gestation to ensure comprehensive care. Despite this, delayed initiation and inconsistent follow-up persist in Musanze District, due to structural and socio-cultural barriers such as long distances to health facilities, transportation costs, cultural norms discouraging early pregnancy disclosure, and limited knowledge, attitudes, and practices regarding ANC (Sserwanja et al., 2022; NISR, 2019).

Maternal health continues to be a major public health concern, with approximately 800 women dying each day from pregnancy- and childbirth-related causes, 95% of which occur in low- and middle-income countries and 70% in sub-Saharan Africa (WHO, 2022). Limited evidence exists on the determinants of ANC utilization in Musanze District, hindering the development of targeted interventions to improve uptake. This study aims to assess the factors influencing the utilization of antenatal care services among pregnant women attending Muhoza Health Center. The findings will inform evidence-based strategies to enhance ANC attendance, improve maternal and neonatal health outcomes, and strengthen the well-being and livelihoods of women and their families.

2. METHODOLOGY

This study employed a descriptive cross-sectional cohort design with a mixed-methods approach to investigate factors influencing antenatal care (ANC) utilization among pregnant women attending Muhoza Health Center in Musanze District, Rwanda. Quantitative data were collected from 427 pregnant women using semi-structured questionnaires capturing socio-demographics, accessibility, and knowledge, attitudes, and practices (KAP) related to ANC. Qualitative data were obtained through key informant interviews (KIIs) with healthcare providers and focus group discussions (FGDs) with pregnant women to explore cultural beliefs, barriers, and enablers. Retrospective review of ANC records over the previous 6–12 months triangulated self-reported data. All tools were pretested, and data collectors received training to ensure clarity, reliability, and adherence to ethical standards.

Participants were selected using systematic random sampling for the quantitative survey and purposive sampling for KIIs and FGDs. Inclusion criteria were pregnant women aged 15–49 years attending at least one ANC visit during the current pregnancy and residing in Musanze District. Exclusion criteria included medical instability, refusal to provide consent, or non-residency. Sample size was calculated using Fisher's formula for large populations, adjusted for a 10% non-response rate, yielding a final sample of 427 participants. Ethical approval, informed consent, and confidentiality were strictly maintained throughout the study.

Data analysis combined quantitative and qualitative approaches. Quantitative data were analyzed using SPSS v21 with descriptive statistics (frequencies, percentages, means, standard deviations) and inferential statistics (Chi-square tests and logistic regression) to assess associations between socio-demographics, accessibility, socio-cultural factors, KAP, and ANC utilization. Qualitative data were thematically analyzed to contextualize quantitative findings. The study was guided by a conceptual framework illustrating how socio-demographic, accessibility, socio-cultural, and KAP factors influence ANC utilization, which in turn affects maternal and neonatal health outcomes and the livelihood of women and their families (Silali, 2025).

3. RESULTS

Prevalence of utilization of antenatal services

Figure 1 illustrates the distribution of antenatal care (ANC) utilization among pregnant women attending Muhoza Health Center. The findings indicate that a substantial majority of participants (approximately 91%) reported attending at least four ANC visits, meeting or exceeding the World Health Organization's previously recommended minimum. In contrast, only about 9% of respondents attended fewer than four visits.
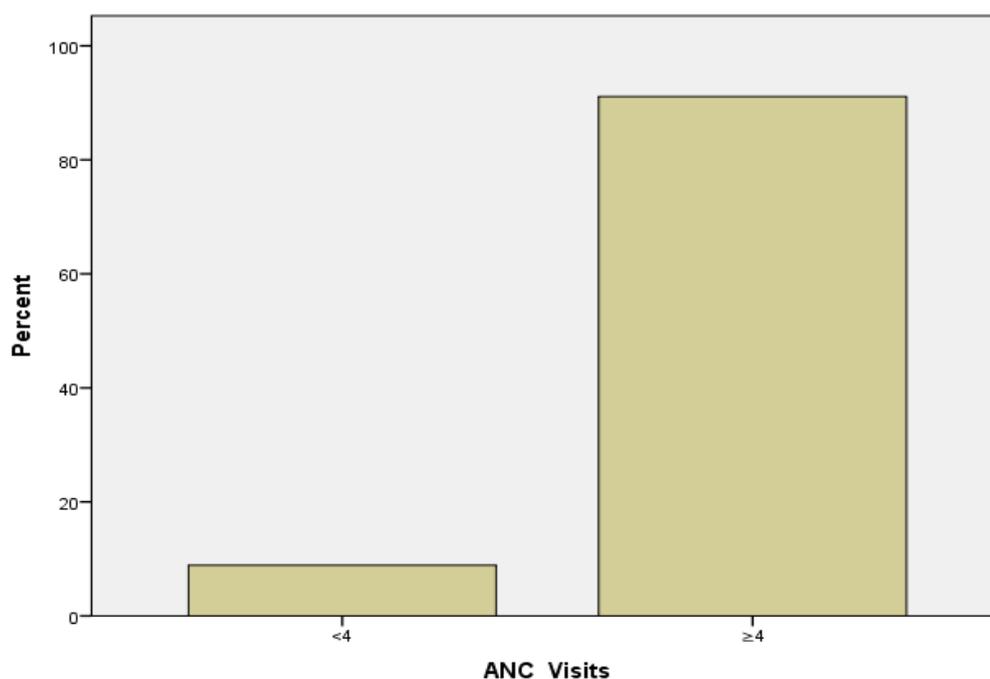
Figure 1: Prevalence of ANC Utilization

Demographic factors and antenatal care (ANC) utilization

As shown in table 1, significant associations were observed between demographic factors and antenatal care (ANC) utilization among the 427 participants (all p < 0.01). Age was significantly associated with ANC visit frequency (χ^2 = 56.18, p < 0.01), with the highest proportion of women achieving $\geq$ 4 ANC visits found among those under 19 years (97.75%), followed by women aged 20–29 years (94.51%) and 30–49 years (70.59%). Educational level also showed a significant relationship with ANC attendance (χ^2 = 63.34, p < 0.01); all women without formal education attended $\geq$ 4 ANC visits (100%), as did the majority of those with primary (97.69%) and secondary education (87.06%). However, attendance was lower among women with tertiary education (70.73%), suggesting a potential inverse association between higher education and ANC utilization in this sample. Marital status exhibited the strongest association with ANC visits (χ^2 = 145.72, p < 0.01), with nearly all single women attending $\geq$ 4 visits (98.59%) compared to just over half of married women (54.17%), indicating a substantial disparity in ANC utilization between these groups. Occupation was also significantly associated with ANC attendance (χ^2 = 30.23, p < 0.01), with women without occupation having the highest attendance (98.27%), followed by those in casual employment (91.33%) and business (78.85%).

Table 1: Demographic factors of utilization of antenatal services

		ANC_Visits n=417		X2	P-Value
		<4 visits[n(%)]	$\geq$ 4 visits [(n(%)]		
Age	< 19 years	4(2.25%)	174(97.75%)	56.18	<.01
	20-29 years	9(5.49%)	155(70.59%)		
	30-49 years	25(29.41%)	60(70.59%)		
Education	None	0(0%)	130(100%)	63.34	<.01
	Primary	3(2.31%)	127(97.69%)		
	Secondary	11(12.94%)	74(87.06%)		
	Tertiary	24(29.27)	58(70.73%)		
Marital Status	Married	33(45.83)	39(54.17%)	145.72	<.01
	Single	5(1.41%)	350(98.59%)		
Occupation	Business	22(21.15%)	82(78.85%)	30.23	<.01
	Casual	13(8.67%)	137(91.33%)		
	None	3(1.73%)	170(98.27%)		

Accessibility factors associated with antenatal care utilization

Table 2 summarizes the associations between accessibility factors and ANC attendance. First visit trimester was not significantly associated with the number of ANC visits (χ^2 = 2.57, p = 0.46), with consistently high proportions of women attending ≥ 4 visits across first (90.59%), second (89.02%), and third trimester bookings (91.11%), as well as those with unknown booking trimester (94.35%). Pregnancy type demonstrated a significant association with ANC utilization (χ^2 = 37.10, p < 0.01), where women with unplanned pregnancies were more likely to attend ≥ 4 visits (96.17%) compared to those with planned pregnancies (77.19%). Waiting time was also significantly associated with ANC attendance (χ^2 = 68.94, p < 0.01); nearly all women experiencing long waiting times achieved ≥ 4 visits (97.80%), whereas those with short waiting times reported lower attendance (71.56%). Health insurance status was not significantly associated with ANC utilization (χ^2 = 4.69, p = 0.10), with high attendance rates observed among women without insurance (95.21%), those covered by Mutuelle (89.44%), and those with private insurance (88.49%).

Table 2: Accessibility factors of utilization of antenatal services

		ANC Visits n=427		X2	P-Value
		<4 visits[n(%)]	≥ 4 visits [(n(%)]		
First visit Trimester	First	8(9.41%)	77(90.59%)	2.57	0.46
	Second	19(10.98%)	154(89.02%)		
	Third	4(8.89%)	41(91.11%)		
	Unknown	7(5.65%)	117(94.35%)		
Pregnancy Type	Planned	26(22.81%)	88(77.19%)	37.10	<.01
	Unplanned	12(3.83%)	301(96.17%)		
Waiting Time	Long	7(2.20%)	311(97.80%)	68.94	<.01
	Short	31(28.44%)	78(71.56%)		
Insurance	Mutuelle	15(10.56%)	127(89.44%)	4.69	0.10
	None	7(4.79%)	139(95.21%)		
	Private	16(11.51%)	123(88.49%)		

Social cultural factors influencing utilization of antenatal services

Sociocultural factors showed mixed associations with ANC utilization (Table 3). Religion was not significantly associated with ANC attendance (χ^2 = 1.72, p = 0.42), with similarly high proportions of women attending ≥ 4 visits among Christians (90.61%), Muslims (93.39%), and other religions (86.21%). Decision-making authority within the household also showed no significant effect (χ^2 = 3.21, p = 0.07), although women whose ANC decisions were made by others had a slightly higher attendance (92.10%) than those who decided themselves (85.00%). In contrast, trust in health workers was strongly associated with ANC utilization (χ^2 = 91.21, p < 0.01), where women reporting low (97.81%) or moderate (97.48%) trust in health workers had substantially higher attendance of ≥ 4 visits compared to those reporting high trust (64.71%).

Table 3: Social cultural factors influencing utilization of antenatal services

		ANC_Visits n=427		X2	P-Value
		<4 visits[n(%)]	≥ 4 visits [(n(%)]		
Religion	Christian	26(9.39%)	251(90.61%)	1.72	0.42
	Muslim	8(6.61%)	113(93.39%)		
	Other	4(13.79%)	25(86.21%)		
Decision Maker	Others	29(7.90%)	338(92.10%)	3.21	0.07
	Self	9(15.00%)	51(85.00%)		
Trust in Health Workers	High	30(35.29%)	55(64.71%)	91.21	<.01
	Low	4(2.19%)	179(97.81%)		
	Moderate	4(2.52%)	155(97.48%)		

Knowledge, attitudes, and practices related to ANC utilization

Participants with good knowledge of ANC were significantly more likely to attend four or more ANC visits compared with those with poor knowledge (53.85% vs. 0.57%, χ^2 = 163.37, $p < 0.01$). Similarly, good knowledge regarding the timing of ANC booking was associated with higher proportions of women initiating ANC early (69.90% vs. 2.16%, χ^2 = 75.24, $p < 0.01$) (Table4).

Table 4: Knowledge, altitude and practices influence utilization of antenatal services

		ANC_Visits n=417		X2	P-Value
		<4 visits[n(%)]	≥ 4 visits [(n(%)]		
Knowledge ANC Visits	Good	36(46.15%)	42(53.85%)	163.37	<.01
	Poor	2(0.57%)	347(99.43%)		
Knowledge Booking	Good	31(30.10%)	72(69.90%)	75.24	<.01
	Poor	7(2.16%)	317(97.84%)		

4. DISCUSSION

This study found a notably high prevalence of antenatal care (ANC) utilization, with 91% of pregnant women attending at least four ANC visits, meeting or surpassing the former World Health Organization (WHO) recommendation of a minimum of four visits (WHO, 2016). This uptake is substantially higher than national averages reported in the 2020 Rwanda Demographic and Health Survey (NISR et al., 2021), which documented 56% of women completing four or more ANC visits. Such high adherence in the present study may reflect effective community mobilization, improved service accessibility at Muhoza Health Center, and increased maternal health awareness within the catchment population (Mukabutera et al., 2016). Nevertheless, the 9% of women attending fewer than four visits underscores the persistent need to address barriers affecting this minority subgroup (Tsawe & Susuman, 2014).

Significant associations were observed between ANC attendance and age, education, marital status, and occupation. Adolescents (<19 years) demonstrated the highest attendance rates (97.75%), contrary to findings from other African settings where younger mothers often have lower ANC coverage due to stigma or knowledge gaps (Adjiwanou & LeGrand, 2013; Pell et al., 2013). This may indicate successful targeting of youth-friendly maternal health interventions in the study area (Mgata & Maluka, 2019). Education showed a counterintuitive pattern, with women without formal education achieving 100% attendance, while those with tertiary education had the lowest rate (70.73%). This inverse relationship may reflect differences in health service expectations, scheduling flexibility, or perceived necessity among more educated women—an area warranting qualitative exploration (Simkhada et al., 2008). Marital status emerged as the strongest determinant, with single women far more likely to complete the recommended visits than married women. This diverges from global evidence, where marital union often facilitates healthcare engagement (Gross et al., 2012), and could be influenced by social support dynamics or household decision-making norms in the local context (Gabrysch & Campbell, 2009). Occupational status also influenced attendance, with unemployed women demonstrating the highest adherence, potentially due to greater availability of time for clinic visits compared to those engaged in business activities (Ochako et al., 2011).

Contrary to expectation, neither the timing of the first ANC visit nor health insurance status was significantly associated with the number of visits. The consistently high attendance across all booking trimesters suggests strong continuity of care once ANC is initiated (Downe et al., 2019). However, pregnancy type and waiting time were significant determinants. Women with unplanned pregnancies had higher attendance rates than those with planned pregnancies, possibly reflecting heightened concern or health-seeking behavior in unexpected pregnancies (Mason et al., 2015). Paradoxically, longer waiting times were associated with greater adherence, which may indicate that women perceiving the value of care are more willing to endure service delays, or that high-volume days—when waits are longer coincide with targeted outreach services (Odetola, 2015).

Neither religion nor household decision-making authority significantly influenced ANC utilization, suggesting that cultural or religious norms in the study population do not strongly constrain ANC attendance (Yaya et al., 2018). However, trust in health workers was unexpectedly inversely related to ANC adherence, with lower trust correlating with higher attendance.

This counterintuitive finding could reflect response bias or an alternative interpretation of "trust" by respondents possibly linked to critical engagement with services rather than disengagement (Kujawski et al., 2015).

Knowledge-related factors emerged as strong predictors of ANC utilization. Women with good knowledge of ANC visit requirements and optimal booking times were significantly more likely to complete four or more visits, consistent with studies showing that awareness of ANC schedules is a critical determinant of service uptake (Ndugga et al., 2020; Tsawe & Susuman, 2014). This reinforces the importance of health education in driving maternal health service use and supports continued investment in community-level information campaigns (Magadi et al., 2000).

This study has some limitations that should be considered when interpreting the findings. First, the cross-sectional design limits the ability to establish causality between identified factors and ANC utilization. Second, self-reported data on ANC attendance and related variables may be subject to recall bias and social desirability bias, potentially inflating utilization rates. And lastly, the study was conducted in a single health center, which may limit generalizability to other settings with different sociodemographic profiles or service delivery contexts.

5. CONCLUSION

This study highlighted the multifaceted determinants influencing adequate antenatal care (ANC) utilization, defined by completion of at least four visits. Key maternal factors including age, educational attainment, marital status, and employment status were significantly associated with adherence to recommended ANC visits. Additionally, pregnancy planning, shorter facility waiting times, trust in healthcare providers, and maternal knowledge regarding ANC schedules emerged as important facilitators of adequate ANC attendance. Although factors such as religion, booking trimester, and health insurance type did not reach statistical significance, trends suggest potential positive influences of early booking and insurance coverage on ANC uptake. These findings underscore the importance of addressing both sociodemographic and health system-related factors to improve ANC utilization, ultimately contributing to better maternal and neonatal health outcomes.

6. RECOMMENDATIONS

Improving antenatal care (ANC) utilization among pregnant women requires a coordinated approach addressing sociodemographic, health system, and knowledge-related determinants. Policymakers should strengthen maternal health education programs, particularly targeting younger women, those with lower educational attainment, and women in informal or no employment, while promoting planned pregnancies and early ANC booking through culturally sensitive, accessible materials. Health system improvements such as reducing waiting times, streamlining service delivery, and enhancing staff capacity alongside continuous training for respectful maternity care, effective communication, and trust-building, are essential to improve accessibility and acceptability. Community and family engagement, including mobilizing household decision-makers, local leaders, and male partners, can foster supportive environments for timely ANC visits. Sustained community-level information campaigns leveraging health workers and local media are critical to improving knowledge about recommended ANC visits and early booking. Finally, further longitudinal and mixed-methods research is recommended to explore causal pathways between trust, knowledge gaps, sociodemographic factors, and ANC utilization, and to evaluate the impact of targeted interventions on maternal and newborn health outcomes.

REFERENCES

[1] Ahinkorah, B. O., Seidu, A. A., Agbaglo, E., Adu, C., Budu, E., Hagan, J. E., Schack, T., & Yaya, S. (2021). Determinants of antenatal care and skilled birth attendance services utilization among childbearing women in Guinea: evidence from the 2018 Guinea Demographic and Health Survey data. BMC Pregnancy and Childbirth, 21(1), 1–11. https://doi.org/10.1186/s12884-020-03489-4

[2] Alhassan, Y., Otiso, L., Okoth, L., Murray, L., Hemingway, C., Lewis, J. M., Oguche, M., Doyle, V., Muturi, N., Ogwang, E., Barsosio, H. C., & Taegtmeyer, M. (2024). Four antenatal care visits by four months of pregnancy and four vital tests for pregnant mothers: impact of a community-facility health systems strengthening intervention in Migori County, Kenya. BMC Pregnancy and Childbirth, 24(1), 1–13. https://doi.org/10.1186/s12884-024-06386-2

[3] Althubaiti, A. (2023). Sample size determination : A practical guide for health researchers. September 2022, 72–78. https://doi.org/10.1002/jgf2.600

[4] Amalia Yunia Rahmawati. (2020). No Title No Title No Title. July, 1–23.

[5]   Anastasi, E., Borchert, M., Campbell, O. M. R., Sondorp, E., Kaducu, F., Hill, O., Okeng, D., Odong, V. N., & Lange, I. L. (2015). Losing women along the path to safe motherhood: Why is there such a gap between women's use of antenatal care and skilled birth attendance? A mixed methods study in northern Uganda. BMC Pregnancy and Childbirth, 15(1), 1–15. https://doi.org/10.1186/s12884-015-0695-9

[6]   Anatea, M. D., Mekonnen, T. H., & Dachew, B. A. (2018). Determinants and perceptions of the utilization of tetanus toxoid immunization among reproductive-age women in Dukem Town, Eastern Ethiopia: A community-based cross-sectional study. BMC International Health and Human Rights, 18(1), 1–10. https://doi.org/10.1186/s12914-018-0168-0

[7]   Andrew, E. V. W., Pell, C., Angwin, A., Auwun, A., Daniels, J., Mueller, I., Phuanukoonnon, S., & Pool, R. (2014). Factors affecting attendance at and timing of formal antenatal care: Results from a qualitative study in Madang, Papua New Guinea. PLoS ONE, 9(5). https://doi.org/10.1371/journal.pone.0093025

[8]   Arefaynie, M., Kefale, B., Yalew, M., Adane, B., Dewau, R., & Damtie, Y. (2022). Number of antenatal care utilization and associated factors among pregnant women in Ethiopia : zero - inflated Poisson regression of 2019 intermediate Ethiopian Demography Health Survey. Reproductive Health, 1–10. https://doi.org/10.1186/s12978-022-01347-4

[9]   bidin A. (2017). Опыт аудита обеспечения качества и безопасности медицинской деятельности в медицинской организации по разделу «Эпидемиологическая безопасностьNo Title. In Вестник Росздравнадзора (Vol. 4, Issue 1).

[10] Dusingizimana, T., Ramilan, T., Weber, J. L., Iversen, P. O., Mugabowindekwe, M., Ahishakiye, J., & Brough, L. (2023). Predictors for achieving adequate antenatal care visits during pregnancy: a cross-sectional study in rural Northwest Rwanda. BMC Pregnancy and Childbirth, 23(1), 1–9. https://doi.org/10.1186/s12884-023-05384-0

[11] Gitonga, E. (2017). Determinants of Focused Antenatal Care Uptake among Women in Tharaka Nithi County, Kenya. Advances in Public Health, 2017, 1–4. https://doi.org/10.1155/2017/3685401

[12] Islam, M. M., & Masud, M. S. (2018). Determinants of frequency and contents of antenatal care visits in Bangladesh: Assessing the extent of compliance with the WHO recommendations. PLoS ONE, 13(9), 1–22. https://doi.org/10.1371/journal.pone.0204752

[13] Jemutai, F., & Impwii, D. K. (2024). Determinants of Early Antenatal Care Booking among Pregnant Women attending Embu Teaching and Referral Hospital, Kenya: A Cross-sectional Survey. International Journal of Health Sciences and Research, 14(1), 275–282. https://doi.org/10.52403/ijhsr.20240135

[14] Kabir, M. R. (2021). Adopting Andersen's behavior model to identify factors influencing maternal healthcare service utilization in Bangladesh. PLoS ONE, 16(11 November), 1–18. https://doi.org/10.1371/journal.pone.0260502

[15] Lama, T. P., Munos, M. K., Katz, J., Khatry, S. K., Leclerq, S. C., & Mullany, L. C. (2020). Assessment of facility and health worker readiness to provide quality antenatal, intrapartum and postpartum care in rural Southern Nepal. BMC Health Services Research, 20(1), 1–12. https://doi.org/10.1186/s12913-019-4871-x

[16] Liyambo, N. (2017). Barriers To Utilization of Antenatal Care Services Among Pregnant Women in Omaheke Region – Namibia. The Havard Referencing Method, 1995(November), 1–17. http://uir.unisa.ac.za/bitstream/handle/10500/22646/thesis_Jansen van rensburg_sk.pdf?sequence=1&isAllowed=y

[17] Manithip, C. (2012). of Antenatal Care Services in.

[18] Mkhonta, Z., Lu, Y. Y., Kuo, S. C., & Liu, C. Y. (2022). Factors associated with the utilization of antenatal care services among pregnant women in Eswatini - A cross-sectional study. African Journal of Reproductive Health, 26(12), 67–77. https://doi.org/10.29063/ajrh2022/v26i12.8

[19] Mugenda and mugenda 2003 research methods pdf. (n.d.).

[20] Mutowo, J., Yazbek, M., van der Wath, A., & Maree, C. (2021). Barriers to using antenatal care services in a rural district in Zimbabwe. International Journal of Africa Nursing Sciences, 15, 100319. https://doi.org/10.1016/j.ijans.2021.100319

[21] Neupane, B., Rijal, S., Srijana, G. C., & Basnet, T. B. (2020). Andersen ' s model on determining the factors associated with antenatal care services in Nepal : an evidence-based analysis of Nepal demographic and health survey 2016. 1–11.

[22] NISR. (2019). Rwanda Demographic and Health Survey 2019-20 District Pro le City Of Kigali.

[23] Oyinlola, O. A., Sunmola, A. ., Opayemi, A. S., & Mayungbo, O. A. (2018). Barriers to Antenatal Care Use, Childbirth Experience, and Level of Education on Actual Attendance among Pregnant Women. International Journal of Psychology and Educational Studies, 5(3), 72–80. https://doi.org/10.17220/ijpes.2018.03.007

[24] Parvez, K., & Sardar, P. (2020). International Journal of Dentistry and Oral Dental Ethics (A KAP Study). International Journal of Dentistry and Oral Health, 6(March), 48–53.

[25] Program, T. D. H. S. (2014). Rwanda.

[26] SH, H., ES, M., & MG, D. (2016). Timely Initiation of First Antenatal Care Visit of Pregnant Women Attending Antenatal Care Service. Journal of Women's Health Care, 05(06). https://doi.org/10.4172/2167-0420.1000346

[27] Shahabuddin, A., Nöstlinger, C., Delvaux, T., Sarker, M., Delamou, A., Bardají, A., Broerse, J. E. W., & De Brouwere, V. (2017). Exploring maternal health care-seeking behavior of married adolescent girls in Bangladesh: A social-ecological approach. PLoS ONE, 12(1). https://doi.org/10.1371/journal.pone.0169109

[28] Sserwanja, Q., Nuwabaine, L., Gatasi, G., Wandabwa, J. N., & Musaba, M. W. (2022a). Factors associated with utilization of quality antenatal care : a secondary data analysis of the Rwandan Demographic Health Survey 2020. BMC Health Services Research, June. https://doi.org/10.1186/s12913-022-08169-x

[29] Sserwanja, Q., Nuwabaine, L., Gatasi, G., Wandabwa, J. N., & Musaba, M. W. (2022b). Factors associated with utilization of quality antenatal care: a secondary data analysis of the Rwandan Demographic Health Survey 2020. BMC Health Services Research, 22(1), 1–10. https://doi.org/10.1186/s12913-022-08169-x

[30] Teketo Kassaw, G. M., & Aychiluhim, M. (2015). Antenatal Care Service Utilization and its Associated Factors among Mothers who Gave Live Birth in the Past One Year in Womberma Woreda, North West Ethiopia. Epidemiology: Open Access, s2, 1–10. https://doi.org/10.4172/2161-1165.s2-003

[31] Tengera, O., Nyirazinyoye, L., Meharry, P., Rutayisire, R., Rulisa, S., & Haile, Z. T. (2023). Factors associated with receipt of adequate antenatal care among women in Rwanda: A secondary analysis of the 2019–20 Rwanda Demographic and Health Survey. PLoS ONE, 18(4 April), 1–12. https://doi.org/10.1371/journal.pone.0284718

[32] Tiruye, G., Shiferaw, K., Tura, A. K., Debella, A., & Musa, A. (2021). Prevalence of premature membrane and its associated factors among pregnant women in Ethiopia : A systematic review and meta-analysis. https://doi.org/10.1177/20503121211053912

[33] Travers, J. L., Hirschman, K. B., & Naylor, M. D. (2020). Adapting Andersen's expanded behavioral model of health services supports. BMC Geriatrics, 20(1), 1–16. https://doi.org/10.1186/s12877-019-1405-7

[34] Tumwizere, G., Mbonye, M. K., & Ndugga, P. (2024). Determinants of late antenatal care attendance among high parity women in Uganda : analysis of the 2016 Uganda demographic and health survey. 1–14.

[35] WHO. (2022). WHO antenatal care recommendations for a positive pregnancy experience, maternal and fetal assessment update : imaging ultrasound before 24 weeks of pregnancy.

[36] Yaya, S., & Bishwajit, G. (2020). Predictors of institutional delivery service utilization among women of reproductive age in Gambia: A cross-sectional analysis. BMC Pregnancy and Childbirth, 20(1), 1–10. https://doi.org/10.1186/s12884-020-02881-4