**Assessment of Factors Influencing Tardiness and Poor-compliance with ANC at Mwembeladu Hospital in Zanzibar, 2024**

**Abstract**

**Background**  
Antenatal care (ANC) is vital for maternal and infant health, yet women in Zanzibar frequently delay their first ANC visit and struggle with adherence to visits to ANC. This study investigates the socio-demographic factors contributing to these delays. It will describe pregnancy characteristics and assess the timing of the first ANC consultations.

**Methodology**  
The research employed a descriptive cross-sectional design at Mwembeladu Hospital, targeting pregnant women receiving ANC. Simple random sampling was used to gather data from 260 participants, with analysis focusing on socio-demographic factors and their impact on ANC attendance.

**Results**  
The majority of participants were multigravida (75.8%), and a significant portion attended their first antenatal care (ANC) visit during the second trimester (54.2%). Notably, despite a high level of education among participants, there was no correlation between educational attainment and timely ANC attendance. Similarly, marital status and partner support did not significantly impact the timing of ANC visits.

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**Conclusion**  
This study highlights that many women in Zanzibar experience delays in antenatal care (ANC) attendance and have a low number of ANC visits, primarily due to the influence of multigravidity. Nearly half of the participants attended fewer than four consultations. Analysis of the timing of the first ANC visit shows that multigravid women seek care later. Additionally, an adequate level of education was not associated with improved attendance at antenatal consultations. There is a critical need for early detection of poor compliance and intervention during pregnancy.

Keywords: Pregnancy, Antenatal clinic, Mwembeladu Hospital, **Poor-compliance**

**Introduction**

Antenatal care (ANC) ensures mothers' and infants' health. Antenatal care (ANC) attendance is generally high, with models like group ANC improving attendance and satisfaction. Group ANC, such as Centering Pregnancy, has shown positive outcomes, particularly for marginalized populations, by enhancing women’s experiences and health results [1], but the use of ANC services remains low in low- and middle-income countries (LMICs) and its quality poor [2]

In Zanzibar, late attendance to ANC and poor adherence to iron-folic acid supplementation (IFAS) remain significant public health challenges. Despite the World Health Organization's recommendation for at least eight ANC visits, many women in Tanzania, including Zanzibar, initiate care late, often after the first trimester [3]

**Factors Contributing to Delayed Antenatal Care (ANC) Attendance in Zanzibar**  
Several factors contribute to the delay in antenatal care (ANC) attendance among pregnant women in Zanzibar, including socio-cultural beliefs, lack of education, and misconceptions about pregnancy [4]. Logistical barriers, such as distance to healthcare facilities and inadequate resources, further exacerbate the situation. Understanding these factors is crucial for developing targeted interventions to improve maternal health outcomes in Zanzibar, where the prevalence of anaemia among pregnant women remains alarmingly high [3][4].

**Socio-Cultural Beliefs Influencing Late ANC Attendance**  
Key socio-cultural beliefs that contribute to delayed ANC attendance in Zanzibar include:

**Fear of Witchcraft**: Many women fear that announcing their pregnancy early may expose them to witchcraft or sorcery, leading to delays in seeking care until the later stages of pregnancy.

**Perceptions of Risk**: A common belief is that complications are less likely in the early stages of pregnancy, causing women to underestimate the need for early ANC visits.

**Cultural Stigma**: Social stigma, especially among adolescents, may prompt women to conceal their pregnancies, leading to delayed ANC attendance.

**Past Negative Experiences**: Previous negative encounters with healthcare providers can discourage women from seeking timely care.

**Lack of Knowledge**: Limited awareness about the importance of early ANC and the recommended timing for initial visits significantly contribute to late attendance.

**Husband’s Support**: The level of support from a woman’s partner can significantly influence her decision to seek timely ANC. Women who face disapproval or lack of encouragement from their husbands are more likely to delay care.

**Community Expectations**: Societal norms often dictate the perceived appropriateness of seeking ANC, with many women adhering to community expectations that discourage early visits.

**Comparative Global Context**  
In low-income countries, women often attend fewer ANC visits, with many failing to meet the recommended four visits during pregnancy [5]. According to the World Health Organization (WHO), in some low-income countries, only approximately 50% of women receive the minimum recommended antenatal visits [6]. Barriers such as limited access to healthcare, cultural beliefs, financial constraints, and lack of education contribute to this disparity. In contrast, women in high-income countries typically receive more comprehensive antenatal care, attending 8 to 10 visits or more throughout their pregnancies. Nearly 90% of pregnant women in high-income nations receive adequate ANC, which includes regular check-ups, screenings, health education, and a strong emphasis on preventive care and the management of pregnancy-related complications [6][7].

"Early antenatal care (ANC), ideally before 12 weeks of gestation, should be a priority and a goal for health systems worldwide. This critical period allows for the early detection of maternal and partner-related health conditions, prevention of sexually transmitted infections, identification of pregnancy-related complications, and assessment of the mother’s nutritional status. Additionally, it is a time to identify biological, psychological, social, and familial risk factors [7]. Healthcare providers can also offer counselling, support, prophylaxis, evaluate oral health, and ensure that the pregnant woman’s immunization schedule is up to date." Also, Maternal mortality remains a significant challenge in resource-limited settings and developing countries. Low antenatal care (ANC) attendance and poor adherence are major contributing factors. This is an important topic and will go a long way in contributing to curbing maternal mortality [8]

**Broad Objectives**

To determine the contributing factors responsible for the late attendance and poor adherence to ANC visits at Mwembeladu Hospital Zanzibar to contribute to a reduction in maternal mortality.

**Specific Objectives**

1. To describe the characteristics of pregnancy among women attending ANC at Mwembeladu Hospital Zanzibar

2. To determine the timing of the first consultation at the antenatal clinic and the number of consultations attended by women attending ANC at Mwembeladu Hospital Zanzibar

3. To identify the factors related to attending the first consultation to clinical prenatal care

among women attending ANC at Mwembeladu Hospital Zanzibar

**Methodology**

**Study Area**  
The study was conducted at Mwembeladu Maternity Hospital, located in Zanzibar. This facility provides maternity care for low-risk expectant mothers. The antenatal care (ANC) patients at this facility are pregnant women receiving care during their pregnancy.

**Study Population**  
The study population consisted of pregnant women receiving antenatal care at Mwembeladu Hospital. These women were selected as part of the study sample.

**Research Design**  
This study employed a descriptive cross-sectional design to determine the proportion of pregnant women attending ANC who did not adhere to the recommended schedule of antenatal visits.

**Sampling Method**  
Pregnant women attending ANC at Mwembeladu Hospital were selected using simple random sampling (SRS).

**Determining the Sample Size**  
The sample size was calculated using the formula:  
N=Z2×P×qE2N = \frac{Z^2 \times P \times q}{E^2}  
where Z = 1.96 (for a 95% confidence level), P = 0.203 (based on prior research), and E = 0.05 (the margin of error). To account for potential non-response, 5% was added to the initial sample size of 260, resulting in a final sample size of 273 participants.

* **Inclusion Criteria**: All expectant mothers attending ANC at Mwembeladu Hospital were eligible.
* **Exclusion Criteria:** Pregnant women with mental health disorders and those who refuse to participate by not signing the consent form

**Sampling Technique**  
Simple random sampling (SRS) was employed to select respondents for the study. This method ensures that every member of the study population has an equal chance of being included in the sample. Pregnant women attending antenatal care (ANC) at the selected facility were chosen using this technique.

**Study Variables**

**Dependent Variable**

* + Attendance to ANC visits.
  + Timing of initiating ANC.

**Independent Variables**

* + **Social Demographic Factors**: Age, educational status, marital status, and occupational status.
  + **Obstetric and Health-Related Factors**: Gravidity, number of children.

**Data Collection Tools**  
A semi-structured questionnaire was used for data collection, with versions available in English and Swahili.

**Data Collection Techniques**  
Both primary and secondary data collection methods were utilized.

* **Primary Data Collection Methods**  
  Primary data were gathered through face-to-face interviews using an open-ended questionnaire, group discussions with the target population, and personal observation.
* **Secondary Data Collection Methods**  
  Secondary data were obtained from up-to-date documentary sources, including published and unpublished books and journal articles.

**Data Processing and Analysis**  
The collected data were described, categorized by different variables, tabulated, and presented using various graphical representations. Data compilation and analysis were performed using the Statistical Package for Social Sciences (SPSS), version 22. Statistical techniques such as the chi-square test and odds ratios were employed to verify and analyze specific quantities.

**Results**

**Table 1: Pregnancy Characteristics and Antenatal Care Attendance among pregnant women in Mwembeladu Hospital Zanzibar n=260**

|  |  |  |
| --- | --- | --- |
| **Obstetric and health facility-related data** | **Frequency** | **Percentages (%)** |
| **Gravidity** |  |  |
| Primigravid | 63 | 24.2 |
| Multigravida | 197 | 75.8 |
| **TOTAL** | **260** | **100** |
| **Gestational age (months)** |  | |
| 1-3 | 41 | 15.8 |
| 4-7 | 131 | 50.4 |
| 8-9 | 88 | 33.8 |
| **TOTAL** | **260** | **100** |
| **TOTAL** | **260** | **100** |
| **Time attended ANC** |  | |
| Less than 4 | 129 | 49.6 |
| Greater than 4 | 131 | 50.4 |
| **TOTAL** | **260** | **100** |

**Table 2 First visit to antenatal clinic and socio-demographic characteristics among pregnant women in Mwembeladu Hospital Zanzibar n=260**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ITEM | FIRST ANTINATAL VISIT | | | CHI SQUQRE |
| AGE YEARS | first trimester  # % | second trimester  # % | third trimester  # % | Chs 4.866  p=0.561  LK R=4.673  p=0.586 |
| 13-22 | 9 (3.4) | 5 ( 1.92 ) | 1 (0.4) |
| 23-32 | 50 (19.2) | 72 (27.7) | 13 (5) |
| 33-42 | 30 (11.5) | 55 (21.1) | 8 (3.07) |
| 43-50 | 5 (1.92) | 8 (3.07) | 2 (0.76) |
| MARITAL STATUS |  |  |  |  |
| SINGLE | 12 (4.61) | 11 (4.2) | 0 (0) | Chs=6.11  p=0.411  LR= 8.713  p=0.190 |
| MARRIED | 73 (28.1) | 114 (43.8) | 23 ( 8.8) |
| WIDOWED | 7 (2.7) | 10 (3.84) | 1 (0.4) |
| DIVORCED | 2 (0.7) | 5 (1.92) | 0 (0) |
| **Education level** |  |  |  | Chs=10.27  p= 0.114  LR=15.28  p=0.018 |
| PRIMARY | 24 (9.2) | 23 (8.8) | 7 (2.7) |
| SECONDARY | 49 (18.8) | 83 (31.9) | 17 ( 6.5) |
| UNIVERSITY | 17 (6.5) | 26 (10) | 0 (0) |
| NEVER GO TO SCHOOL | 4 (1.5) | 8 (3.1) | 0 (0) |
| OCCUPATION |  |  |  |  |
| HOUSE WIFE | 48 (18.5) | 74 (28.5) | 16 (6.1) | Chs=3.302a  p=0.509  LR=3.70  p=0.448 |
| DAILY LABOUR | 31 (11.9) | 49 (18.8) | 7 (2.7) |
| GOVERNMENT EMPLOYED | 15 (5,8) | 17 (6.5) | 1 (0.38) |
| FAMILY SIZE |  |  |  |  |
| 1-3 | 48 (18.4) | 74 (28.4) | 17 (6.5) | Chs=6.36  p= 0.174  LR=7.31  p=0.120 |
| 4-6 | 37 (14.2) | 51 ( 19.6) | 3 (1.2) |
| 7-10 | 9 (3.4) | 15 ( 5.7) | 4 (1.5) |
| HUSBAND EDUCATION |  |  |  |  |
| PRIMARY | 19 (7.3) | 20 (7.7) | 6 (2.3) | Chs=11.26  p=0.81  LR=11.30  p=0.80 |
| SECONDARY | 48 (18.4) | 95 (36.5) | 10 (3.8) |
| UNIVERSITY | 21 (8.1) | 22 (8.4) | 6 (2.3) |
| NEVER GO TO SCHOOL | 6 ( 2.3) | 3 (1.2) | 2 (0.7) |
| TIME RECEIVED |  |  |  |  |
| Primigravida | 21 (8.07) | 29 (11.1) | 12 (4.61) | Chs=14.191  p= 0. 028  LR= 13.37  p= 0.038 |
| multigravida | 74 (28.4) | 112 (43.07) | 12 (4.61) |

Fig 1: First Visit to the Antenatal Clinic among pregnant women in Mwembeladu Hospital. Zanzibar. Tanzania

**Pregnancy Characteristics and Antenatal Care Attendance**

In this research, 75.8% of the women were multigravida, while 24.0% were primigravida. Among those who responded to the questionnaire, the majority were in the second trimester of pregnancy (50.4%), followed by the third trimester (33.8%), and the first trimester (15.8%).

Regarding the timing of their first visit to the antenatal care (ANC) clinic, most women attended in the second trimester (54.2%), followed by the first trimester (36.5%) and the third trimester (9.2%).

Regarding the number of ANC consultations attended, 50.4% of the women had more than four consultations, while 49.6% attended fewer than four ANC consultations.

**First visit to antenatal clinic and socio-demographic characteristics**

The most significant number of pregnant women (89.4%) belonged to the age group of 22 to 42 years, with 51.9% specifically between 23 and 32 years old. Among these age groups, only 5.65% attended their first ANC consultation in the second trimester. Women under 22 were also noted; however, the age groups had no significant differences. Table 2

Eighty percent (80.7%) of the pregnant women were married, and it was predominantly among this group that women attended their first ANC consultation in the second trimester. Again, there were no significant differences based on marital status.

Regarding occupation, most women were housewives (53%), followed by those engaged in daily labour (33.4%), while only 12.6% were employed by the government. This occupational factor also did not show significant differences in the timing of the first ANC visit.

Small families of 1 to 3 members predominated (53.4%), followed by families with 4 to 6 members (35%), and families with 6 to 10 members made up 10.6%. Family size did not appear to be related to the timing of the first ANC visit.

Regarding the husband's education, 58.8% had completed secondary education, and this group predominantly attended the clinic for the first time in the second trimester. Additionally, 18.8% of husbands had a university education, 17.3% had primary education, and only 4.2% had never attended school. Overall, there was a good educational level among the husbands; however, this did not influence their wives' decision to attend ANC in the first trimester of pregnancy.

Regarding the time of conception, the majority of pregnant women were multigravida (76.2%). Still, despite their experience, only 28.4% attended their first ANC consultation in the first trimester, while 43.07% did so in the second and 4.61% in the third. Primigravida women accounted for 23.8%. This difference was significant, with a Chi-square value of 0.028, indicating that multigravida status was associated with a higher risk of late attendance to ANC.

**Discussion**

**Pregnancy Characteristics and Antenatal Care Attendance**

This research found that more than two-thirds of pregnant women who attended the ANC were multigravid. This is consistent with findings by Gebrekidan and Gebremichael in Ethiopia [9] and Mulondo in Limpopo, South Africa [10]. Concerning the first visit for pregnancy assistance, some workers found that more than half of the pregnant women attended ANC late [11][12]. Similarly, Palamuleni in Malawi found that most first visits to ANC occurred after the first trimester of pregnancy [13].

Only about a third of pregnant women attended ANC early, similar to those in Uganda [14], which aligns with studies in Ethiopia [15]. In Afghanistan, Samiah found that more than half of women came late to ANC [16]. Cameroon also has a high percentage of delays in attending the first visit to ANC, which is related to a low perception of the importance of early pregnancy detection[17].

Early pregnancy detection is a critical practice that helps promptly identify complications and allows for timely interventions. During this period, women receive essential information on nutrition, hygiene, and preventive measures, including guidance on proper diet, iron and folic acid supplementation, and vaccinations. Initiating these interventions early can have a positive impact on both maternal and fetal health. Women also receive education on pregnancy, childbirth, and postpartum care. Risk factors such as diabetes mellitus, arterial hypertension, infections, anaemia, low weight, and obesity can be identified at this stage. Therefore, timely attendance at antenatal care (ANC) is crucial.

Sociodemographic Factors Influencing Initial Visits to ANC Prenatal Clinics

This study examined the sociodemographic factors influencing the first visit to the antenatal care (ANC) clinic. The age group most significantly impacted attendance was between 23 and 32 years, aligning with women's expected reproductive age. Notably, a small percentage of pregnancies were in women under 22. Most of these pregnant women attended the ANC during the second trimester of their pregnancies. The findings were consistent with other workers who studied over 45,000 women [18][19].

Furthermore, more than 70% of the participants were married, with many identified as housewives, mirroring the results found in Nigeria [20]. The study demonstrated that while over half of the respondents had attained education at the secondary level or higher (3rd quartile), this did not improve ANC attendance. The likelihood ratio was significant at 15.28 (p = 0.018). This finding is, however, in contrast with a multicenter study in Nigeria, which reported that 45.2% of the 21,447 pregnant women studied had not received an education, correlating this lack of education with inadequate continuous maternal care (p < 0.000) [21]

Regarding occupation, more than half of the participants were housewives, and small families predominated. However, neither factor significantly influenced the timing of the first visit to the ANC, which is consistent with findings reported by workers in Ethiopia [22]. The study also indicated that the husbands of the pregnant women generally had a good educational background, with only a tiny percentage being illiterate. However, this did not correlate with their partners attending the first ANC visit during the first trimester, which aligns with the reports by Olayinka in Nigeria [20].

Additionally, more than two-thirds of the women had multiple pregnancies, a factor associated with delayed attendance at the first ANC consultation. This is consistent with a systematic review of 37 fragile and conflict-affected situations [23] and the reports of workers in Yemen and Kigombani, Dar es Salaam [24][25].

**Conclusion**

In this study, most of the pregnant women surveyed were multigravida, with more than two-thirds in the second and third trimesters of pregnancy at the time of the survey. A significant number attended their first antenatal care (ANC) consultation late, and nearly half attended fewer than four consultations. Among the factors associated with the timing of the first visit to the ANC, multigravid women tended to participate later. Furthermore, an adequate education level was not associated with improved attendance at antenatal consultations.

**Ethical Approval and Consent**  
The Zanzibar Health Research Institute (ZAHREC) granted ethical clearance for the study, with reference number ZAHREC/05/MARCH/2023/39. All data collected were kept strictly confidential and used solely for this research. Written informed consent was obtained from all study participants, and personal identifiers were removed during data collection to maintain confidentiality.

**Recommendations**

According to WHO recommendations, future interventions should focus on community education, addressing socio-cultural barriers, and enhancing healthcare access to improve early attendance at ANC and increase the number of visits to those clinics among pregnant women in Zanzibar.

Limitations of the study

This study was conducted in a small Hospital in the urban area of the Unguja Island Zanzibar. It does not represent the entire population.

Disclaimer (Artificial intelligence)

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Details of the AI usage are given below:

1.

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References

[1] F. Sadiku *et al.*, “Maternal satisfaction with group care: a systematic review.,” *AJOG Glob. reports*, vol. 4, no. 1, p. 100301, Feb. 2024, doi: 10.1016/j.xagr.2023.100301.

[2] J. Sharma, M. O’Connor, and R. Rima Jolivet, “Group antenatal care models in low- and middle-income countries: A systematic evidence synthesis,” *Reprod. Health*, vol. 15, no. 1, 2018, doi: 10.1186/s12978-018-0476-9.

[3] E. Eliufoo, V. Majengo, Y. Tian, D. Bintabara, F. Moshi, and Y. Li, “Determinants of adequate antenatal care visits among pregnant women in low-resource setting: evidence from Tanzania national survey,” *BMC Pregnancy Childbirth*, vol. 24, no. 1, 2024, doi: 10.1186/s12884-024-06989-9.

[4] S. Mgata and S. O. Maluka, “Factors for late initiation of antenatal care in Dar es Salaam, Tanzania: A qualitative study,” *BMC Pregnancy Childbirth*, vol. 19, no. 1, pp. 1–9, 2019, doi: 10.1186/s12884-019-2576-0.

[5] A. A. Gebeyehu *et al.*, “Inadequacy of antenatal care attendance and its determinants amongst pregnant women in Ethiopia based on the 2019 Mini-Ethiopian demographic health survey: secondary data analysis,” *BMC Pregnancy Childbirth*, vol. 24, no. 1, p. 682, 2024, doi: 10.1186/s12884-024-06884-3.

[6] Tunçalp *et al.*, “WHO recommendations on antenatal care for a positive pregnancy experience—going beyond survival,” *BJOG An Int. J. Obstet. Gynaecol.*, vol. 124, no. 6, pp. 860–862, 2017, doi: 10.1111/1471-0528.14599.

[7] M. Singh and A. Rahman, “Equity and Accessibility of Antenatal Care Utilization in India,” *Int. J. Trop. Dis. Heal.*, vol. 41, no. 24 SE-Review Article, pp. 33–46, Dec. 2020, doi: 10.9734/ijtdh/2020/v41i2430431.

[8] E. E. Petersen *et al.*, “Vital Signs: Pregnancy-Related Deaths, United States, 2011-2015, and Strategies for Prevention, 13 States, 2013-2017.,” *MMWR. Morb. Mortal. Wkly. Rep.*, vol. 68, no. 18, pp. 423–429, May 2019, doi: 10.15585/mmwr.mm6818e1.

[9] T. G. Gebremichael and T. G. Welesamuel, “Adherence to iron-folic acid supplement and associated factors among antenatal care attending pregnant mothers in governmental health institutions of Adwa town, Tigray, Ethiopia: Cross-sectional study.,” *PLoS One*, vol. 15, no. 1, p. e0227090, 2020, doi: 10.1371/journal.pone.0227090.

[10] M. Seani, “Factors associated with underutilisation of antenatal care services in Limpopo, South Africa,” *Br. J. Midwifery*, vol. 28, pp. 788–795, Nov. 2020, doi: 10.12968/bjom.2020.28.11.788.

[11] A. Mekonnen, W. Alemnew, Z. Abebe, and G. D. Demissie, “Adherence to Iron with Folic Acid Supplementation Among Pregnant Women Attending Antenatal Care in Public Health Centers in Simada District, Northwest Ethiopia: Using Health Belief Model Perspective.,” *Patient Prefer. Adherence*, vol. 15, pp. 843–851, 2021, doi: 10.2147/PPA.S299294.

[12] N. Ali, I. Elbarazi, S. Alabboud, F. Al-Maskari, T. Loney, and L. Ahmed, “Antenatal Care Initiation Among Pregnant Women in the United Arab Emirates: The Mutaba’ah Study,” *Front. Public Heal.*, vol. 8, Jun. 2020, doi: 10.3389/fpubh.2020.00211.

[13] M. E. Palamuleni, “Factors Associated with Late Antenatal Initiation among Women in Malawi.,” *Int. J. Environ. Res. Public Health*, vol. 21, no. 2, Jan. 2024, doi: 10.3390/ijerph21020143.

[14] W. Acup *et al.*, “Factors associated with first antenatal care (ANC) attendance within 12 weeks of pregnancy among women in Lira City, Northern Uganda: a facility-based cross-sectional study,” *BMJ Open*, vol. 13, no. 7, p. e071165, Jul. 2023, doi: 10.1136/bmjopen-2022-071165.

[15] A. Adere and S. Tilahun, *Magnitude of late initiation of antenatal care and its associated factors among pregnant women attending antenatal care in Woldia Public Health Institution, North Wollo, Ethiopia.* 2020. doi: 10.21203/rs.3.rs-61704/v1.

[16] S. Samiah, M. H. Stanikzai, A. W. Wasiq, and H. Sayam, “Factors associated with late antenatal care initiation among pregnant women attending a comprehensive healthcare facility in Kandahar Province, Afghanistan.,” *Indian J. Public Health*, vol. 65, no. 3, pp. 298–301, 2021, doi: 10.4103/ijph.IJPH\_62\_21.

[17] M. A. Venyuy *et al.*, “Determinants to late antenatal clinic start among pregnant women: the case of Saint Elizabeth General Hospital, Shisong, Cameroon.,” *Pan Afr. Med. J.*, vol. 35, p. 112, 2020, doi: 10.11604/pamj.2020.35.112.18712.

[18] A.-A. Seidu, “A multinomial regression analysis of factors associated with antenatal care attendance among women in Papua New Guinea.,” *Public Heal. Pract. (Oxford, England)*, vol. 2, p. 100161, Nov. 2021, doi: 10.1016/j.puhip.2021.100161.

[19] A. F. Fagbamigbe, B. Mashabe, L. Lepetu, and C. Abel, “Are the timings and risk factors changing? Survival analysis of timing of first antenatal care visit among pregnant women in Nigeria (2003-2013).,” *Int. J. Womens. Health*, vol. 9, pp. 807–819, 2017, doi: 10.2147/IJWH.S138329.

[20] T. Olufemi Olayinka, I. Sebutu Bello, T. Oluwafemi Olajubu, O. Oloyede Oyegbade, A. Omobolanle Olajubu, and I. Tamunotonye Ezeoma, “Factors Influencing the Booking Gestational Age Among Antenatal Clinic Attendees at Primary Health Centers in South West, Nigeria: A Cross-Sectional Study.,” *SAGE open Nurs.*, vol. 8, p. 23779608221139080, 2022, doi: 10.1177/23779608221139078.

[21] O. K. Oyedele, A. F. Fagbamigbe, O. J. Akinyemi, and A. S. Adebowale, “Coverage-level and predictors of maternity continuum of care in Nigeria: implications for maternal, newborn and child health programming.,” *BMC Pregnancy Childbirth*, vol. 23, no. 1, p. 36, Jan. 2023, doi: 10.1186/s12884-023-05372-4.

[22] A. Edessa, N. Dida, and E. Teferi, “Early initiation of antenatal care and its associated factors among antenatal care followers at public health facilities in Ambo town administration, Central Ethiopia.,” *J. Fam. Med. Prim. care*, vol. 12, no. 1, pp. 67–75, Jan. 2023, doi: 10.4103/jfmpc.jfmpc\_725\_22.

[23] K. M. Alibhai, B. R. Ziegler, L. Meddings, E. Batung, and I. Luginaah, “Factors impacting antenatal care utilization: a systematic review of 37 fragile and conflict-affected situations.,” *Confl. Health*, vol. 16, no. 1, p. 33, Jun. 2022, doi: 10.1186/s13031-022-00459-9.

[24] S. Othman, T. Almahbashi, A. Al-abed, and A. Abdulwahed, “Factors affecting utilization of antenatal care services in Sana’a city, Yemen,” *Malaysian J. Public Heal. Med.*, vol. 17, pp. 1–14, Dec. 2017, doi: 10.37268/mjphm/vol.17/no.3/art.230.

[25] A. Ndomba, M. Ntabaye, I. Semali, T. Kabalimu, G. Ndossi, and Y. Mashalla, “Prevalence of late antenatal care booking among pregnant women attending public health facilities of Kigamboni Municipality in Dar es Salaam region, Tanzania,” *Afr. Health Sci.*, vol. 23, pp. 623–631, Jul. 2023, doi: 10.4314/ahs.v23i2.72.