



Health Workers' Perspectives on Antenatal Care and the Efficacy of a Community-Based Strategy in Augmenting ANC Follow-Up Contacts in Nyamira County, Kenya

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Abstract

BACKGROUND

Globally, ensuring proper care for pregnant women is vital. In Nyamira County, Kenya, we explored how well community-based methods and clear health messages boost the number of check-ups pregnant women attend. This study explores health workers' perspectives on ANC and assesses the efficacy of a community-based approach in enhancing focused ANC follow-up contacts.

MATERIALS AND METHODS

Using a mixed-method approach (explanatory sequential study design and quasi-experimental), we employed purposive sampling for key informants and a census for expectant women. Eighteen key informant interviews were conducted, and quantitative data were collected through researcher-administered questionnaires. ANC booklets and registers were analyzed for contact completion. Thematic analysis was applied to qualitative data. Statistical analysis included the chi-square test for independence, odds ratios, and 95% confidence intervals.

RESULTS

Healthcare providers emphasized the preference for initial ANC attendance and identified gaps in uptake due to ignorance. Primigravida showed higher motivation for scheduled ANC visits. Health education significantly improved compliance with recommended ANC contacts. Initially, no significant difference existed between study sites (p-value 0.065; OR 1.72, 95% CI: 0.963 to 3.076). After the intervention, a substantial difference emerged (P-value <0.001). The intervention group was 4.2 times more likely to complete recommended ANC contacts than the control group (OR: 4.1881; 95% CI: 2.274 to 7.69).

CONCLUSION

Enhancing ANC contacts involves providing health education through established channels, such as Community Health Volunteers (CHVs), and conducting community-level sensitization and advocacy.

RECOMMENDATIONS

The county government of Nyamira is advised to adopt a packaged health messages tool to reinforce compliance with recommended ANC contacts.

Keywords: Antenatal care, Community-based strategy, Focused Antenatal Care Contacts

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Introduction

Enhancing ANC follow-up contacts among women of reproductive age is of utmost importance. Antenatal care is one of the pillars of maternal and child health programs aimed at preventing and reducing maternal and child morbidity and mortality¹. It is the care provided to pregnant women by healthcare practitioners to identify maternal risks, prevent and manage complications, encourage positive health behaviours, and build a therapeutic patient-provider relationship².

The 2016 World Health Organization (WHO) guidelines for ANC, shifted the recommended minimum number of ANC contacts from four to eight, specifying the first contact to occur within the first trimester of pregnancy³. Timely initiation of ANC, defined as the first antenatal care contact occurring within the first trimester of pregnancy, provides an opportunity for early screening of modifiable risk factors and pre-existing conditions³.

Globally, while 86 per cent of pregnant women access antenatal care with skilled health personnel at least once, only two in three (65 per cent) received at least four antenatal visits or more. In regions with the highest rates of maternal mortality, such as sub-Saharan Africa and South Asia, even fewer women received the minimum of four antenatal visits (52 % and 49 % respectively)⁴.

Globally it's estimated that 830 women per 100,000 live births die from pregnancy –or childbirth-related complications daily of which almost all of these maternal deaths (99%) occur in developing countries⁴. Most of these maternal deaths are a result of preventable causes⁵.

Inadequate care during the antenatal period breaks a critical link in the continuum of care and affects both women and babies⁶. Many women in Africa under-utilize ANC services, coming late for the services and making fewer than the recommended number of ANC contacts⁷. In Kenya, less than half (47%) of pregnant

women made four or more recommended ANC contacts⁸. A study conducted in Ghana to determine factors influencing utilization of focused ANC services during pregnancy, among postnatal women, recommended an increase in public education and increased participation in ANC services⁹. A study at Tharaka Nithi County, (Kenya) on determinants of ANC Uptake among Women ", found that the level of education, type of employment, household income, parity, and marital status of the pregnant women were the major determinants of focused antenatal care uptake. The study recommended that the Ministry of Health and county Governments increase the awareness of ANC among women of reproductive age¹⁰. This study therefore aimed at assessing the effectiveness of a community-based strategy to enhance ANC follow-up contacts. The study also aimed to determine the health workers' perception of ANC contact uptake among expectant women. This was to aid in designing a strategy to enhance ANC contact uptake among women of reproductive age at Nyamira County.

This study will provide crucial insights for policymakers aiming to enhance the prompt initiation and completion of ANC contacts, thereby fostering maternal and fetal/neonatal health in Kenya. The promotion of healthy behaviors, improved parenting skills, strengthened connections to formal healthcare systems, and increased utilization of skilled birth attendants during delivery are anticipated outcomes with potential contributions to lifelong health.

Materials and Methods

Study design and setting

The study utilized a mixed method approach (explanatory sequential study design and quasi-experimental study design). The study was conducted at selected Sub Counties of Nyamira County, Kenya, between May 2019 and June 2022. Nyamira is administratively



subdivided into five sub-counties namely; Manga, Nyamira North, Nyamira South, Borabu and Masaba North. The County is inhabited mostly by the Kisii people. It has a population of 605,576¹¹. Nyamira County borders Kisii, Homabay, Kericho and Bomet Counties. Nyamira County was selected because it's one of the counties in the Nyanza region with the lowest ANC uptake⁸. Nyamira North was the control group and Masaba North was the intervention group. Both expectant women from Nyamira North and Masaba North had similar characteristics. The two Sub-Counties were picked for the study because they didn't share boundaries and therefore chances of sample contamination were avoided.

Study population

Nurse in charge working at Maternal Child Health /Family Planning (MCH/FP) of the various health facilities and expectant women.

Eligibility Criteria

All expectant women in their first trimester were included in the study. Also, all MCH/FP nurses in charge in both Masaba North and Nyamira North Sub-counties were included in the study.

The study excluded all expectant women who had a pregnancy-related illness since they tended to make more contacts due to their condition. All expectant women who were mentally unstable were excluded since they could be unable to make independent informed decisions. All MCH/FP nurses in charge with less than two months in the clinic were also excluded because of the knowledge deficit to understand the population they were serving.

Sample size

The sample size (n) was calculated using the formula:

$$n = \frac{r + 1}{r} \frac{(P)(1 - P)(Z_{\beta} + Z_{\alpha/2})^2}{(P_1 - P_2)^2}$$

Where r was the ratio of control to interventional group (2:1), p the completion rate of four ANC

visits in Nyamira (47% or 0.47), and 1-p the proportion not completing the four visits (0.53). Additionally, p (1-p) serves as a measure of variability, with a desired power of 0.84 (for 80% power) and a desired level of significance of 1.96 (for a 95% confidence interval). The effect size, derived from a study by Hodin, is the difference in proportions after intervention (19%). The final calculation yields a sample size of 82 for the intervention group and 164 for the control group, resulting in a total of 246.

The study involved a survey in which 327 expectant women aged 15 to 49 years participated. The expectant women were drawn from two sites in Nyamira North which was the control site. The sites included the Ekerenyo sub-county hospital with 185 expectant women Riechieri Health Centre 62 expectant women and Masaba North (80) the intervention site. Eighteen MCH/FP nurses In- charge were interviewed as well.

Sampling technique

Census was utilized to select pregnant women in their first trimester. Nurses in charge of the MCH/FP clinics in the health facilities of the Sub-Counties were purposefully selected.

Pretesting and review of study tools

Data collection tools were pretested at Manga Sub-County facilities that were not part of the study population. A reliability test of Cronbach Alpha 0.732 for the questionnaire was achieved. Two experts reviewed the interview guide to determine the face validity of the instrument. The collected data was analyzed using Cohen's Kappa Index (CKI). A Kappa of 0.87 for inter-rater agreement was achieved (p-value <0.001).

The intervention tool was reviewed and approved by three experts in community and reproductive health who agreed that the tool was adequate for intervention.

Data collection

Key informant interviews were conducted among nurses in charge of the



MCH/FP clinics. Data to determine perceptions on ANC contact uptake among women of reproductive age were collected from the key informants. Study questions were formulated in the study guide and key informants were selected. Eighteen key Informants were informed of the purpose of the study. Eleven study items were administered to obtain in-depth information regarding ANC contact uptake. The interviews were recorded, adequate notes were taken and transcribed, interview summary sheets were developed and descriptive codes were developed. Codes were then entered into NVivo 14 software. This helped to accelerate insights and to achieve the strongest analysis of the data. A questionnaire was administered to all expectant women who met the inclusion criteria by way of face-to-face between the research assistants and participants in the MCH/FP departments. The results informed the development of a packaged health message tool.

The packaged health message tool included; information on the benefits of completing ANC clinic contacts. The tool informed pregnant women that clinic contacts were personalized care provided to a pregnant woman which emphasized on woman's health, her preparation for childbirth and readiness for complications (emergency preparedness). It further encouraged expectant women to inform other pregnant women to visit the nearest healthcare facility. The tool educated pregnant women on the importance of commencing ANC clinic contacts as soon as they realized they were expectant and made all the contacts as ordered.

The tool was reviewed and approved by three experts in community and reproductive health. The expectant women were recruited during their first trimester in their initial contact. In the intervention group, the community health volunteers identified expectant women in the community in their first trimester, recruited them and referred them to the health facility for ANC contact follow-up. They also administered the

packaged health message tool to expectant women in Masaba North (Intervention group). Those identified in the ANC clinic were linked to the CHVs for follow-up and teaching. In the control group (Nyamira North), the expectant women were recruited in their first trimester during their initial visit. However, they were allowed to follow the normal ANC contact routine without the intervention. The clients from both intervention and control groups were followed up until delivery. The ANC booklets and ANC registers were analyzed for ANC attendance completion.

Data analysis

Qualitative data were transcribed, coded and entered into the N-vivo version 12 software and analyzed thematically. Descriptive statistics were measured using frequencies and proportions. ANC attendance was observed from both ANC booklets and ANC permanent registers for both intervention and control groups. Attendance of a minimum of four contacts was termed as completed while those with less than four contacts were termed as incomplete.

The chi-square test for independence was used to test the difference between the outcomes in both intervention and control groups. The ANC contacts uptake between the intervention and the control groups was compared. Those who had four or more contacts were considered to have completed the visits while those with less than four contacts were considered to have not completed the ANC contacts. Statistical significance was determined by use of 95% Confidence intervals and p-value < 0.05. Odds ratios were used to measure the effectiveness of the intervention.

Ethical approval

The study sought ethical approval from the Jomo Kenyatta University of Agriculture and Technology's Institutional Ethics Review Committee (Ref: JKU/2/4/896B), National Commission for Science, Technology and Innovation (Ref: NACOSTI/P/19/45322/28658),



Nyamira County authority and informed consent from the respondents. All study subjects participated willingly and signed the informed consent.

Results

Background characteristics

Three Hundred and twenty-seven (327) respondents were interviewed. Two hundred and fifty-eight (258) respondents were Married (79.6%), fifty-six (56) single (17.3%), five (5) divorced (1.5%), four widowed (1.2%) and one separated (0.3%). The majority of the respondents had formal education (99%). Seventy-one percent (71%) of the respondents were Protestants (71%). Only 8.8% of the respondents were in formal employment.

The majority of the respondents (176; 54.7%) were aged between 18 and 26 years. One hundred and nine (109; 33.9%) respondents were aged between 27 and 35 years. Nine respondents (9; 2.8%) were aged thirty-six years and above.

Key informants' perceptions of ANC contact's uptake

Eighteen (18) nurses in charge from both the intervention and the control group populations were interviewed to determine their perceptions of antenatal care uptake. Three major themes emerged: healthcare providers' perceptions of ANC contacts uptake, interventions/innovations at the facility level to improve ANC uptake, and facilitators and barriers to ANC contacts uptake.

Table 1:
Showing Demographic Information of expectant women

| Variable | | Frequency | Percent | Valid Percent |
|-------------------|-------------------|-----------|---------|---------------|
| Sub- County | Nyamira North | 247 | 75.5 | 75.5 |
| | Masaba North | 80 | 24.5 | 24.5 |
| | Total | 327 | 100 | 100 |
| Education level | None | 4 | 1.2 | 1.3 |
| | Primary | 125 | 38.2 | 39.3 |
| | Secondary | 152 | 46.5 | 47.8 |
| | College | 37 | 11.3 | 11.6 |
| | Total | 318 | 97.2 | 100 |
| Religion | Catholic | 87 | 26.6 | 28.8 |
| | Protestant | 214 | 65.4 | 70.9 |
| | Other | 1 | 0.3 | 0.3 |
| | Total | 302 | 92.4 | 100 |
| | Missing | 25 | 7.6 | |
| Occupation status | Total | 327 | 100 | |
| | Formal Employment | 26 | 8 | 8.8 |
| | Self-Employment | 211 | 64.5 | 71.5 |
| | Unemployed | 58 | 17.7 | 19.7 |
| | Total | 295 | 90.2 | 100 |
| Age group | Missing | 32 | 9.8 | |
| | Total | 327 | 100 | |
| | Below 18 | 28 | 8.6 | 8.7 |
| | 18 -26 | 176 | 53.8 | 54.7 |
| | 27 -35 | 109 | 33.3 | 33.9 |
| | 36 and Above | 9 | 2.8 | 2.8 |
| Total | Total | 322 | 98.5 | 100 |
| | Missing | 5 | 1.5 | |
| | Total | 327 | 100 | |



Theme 1 - Healthcare providers' perceptions of ANC uptake

Preferred ANC contact: Respondents reported a good uptake of the 1st ANC visit, with decreasing frequency for subsequent visits as pregnancies progressed.

"Attendance of the 1st visit 'wanakuja tu kabisa' (they just come), but when you're getting to the 2nd, 3rd, the number keeps reducing." (KI 1)

"ANC uptake is poor, especially for the 2nd-4th visit because even those who come for the first visit arrive around the 2nd trimester, which is still too late." (KI 2)

Ignorance: A respondent highlighted gaps in ANC contact uptake due to ignorance (lack of knowledge) about the importance of ANC visits.

"Many expectant women fail to complete the required ANC contacts due to a lack of health promotion/education." (KI 2)

Theme 2 - Interventions/Innovations at facility level to improve ANC uptake

Reaching out to pregnant women: Health service providers would contact pregnant

women when essential supplies, such as the TT antigen and IFAAS supplements, were available in health facilities, prompting them to come for services.

"When supplies like Tetanus Toxoid vaccine are out of stock, we inform them that we will call once we receive the supply. We do call them to receive the injection." (KI 6)

Community sensitization: Some health facilities conducted community sensitization activities to encourage pregnant women to uptake ANC in these facilities.

"We teach them the importance of visiting ANC clinic earlier during our outreach program. Community Health Volunteers also refer expectant women to the facility." (KI 4)

Theme 3 - Facilitators and barriers for ANC uptake

Individual facilitators: Factors such as the mother-child booklet and the need to understand health status were associated with ANC service uptake, especially for multiparous women. Primigravidas were more motivated to attend all scheduled ANC visits throughout their pregnancies.

Table 2:

Showing key informants demographic characteristics

| Demographic characteristic | Frequency | Valid Percent |
|----------------------------|-------------------|---------------|
| Gender | Male | 6 33.3% |
| | Female | 12 66.7% |
| Marital status | Married | 12 75% |
| | Single | 2 12.5% |
| | Separated | 1 6.3% |
| | Widowed | 1 6.3% |
| Age | 18-26 | 2 11.8% |
| | 27-35 | 10 58.9% |
| | 36 and above | 5 29.4% |
| Cadre | ECN | - |
| | KRCHN | 15 83.3% |
| | BSCN | 3 16.7% |
| Years as MCH/FP In-charge | 2-4 | 9 50% |
| | 5-7 | 7 38.9% |
| | 8 years and above | 2 11.1% |
| Religion | Christian | 18 100% |
| | Muslim | - |



"Multiparous are the ones who come for the ANC booklet and go. They can even come late, like in 36 weeks, only to pick up the mother-child booklet and receive the TT injection. So, they assume they are safe with that booklet and the injection. For primiparous, they try to adhere to the required contacts. You won't compare them with multiparous." (HSP6)

Health facility facilitators: Motivators within health facilities contributing to increased ANC contacts uptake included the provision of Linda Mama registration, ANC profiling tests, provision of commodities (e.g., mosquito nets), and Community Health Volunteer (CHV) follow-up as a strategy to encourage ANC attendance and support ANC defaulter tracing.

"Linda mama has uplifted our facility regarding the first visits and the second visit,

and they are so punctual because they know if they don't come for the second visit, the third will not help them during delivery. That is why they usually come. The TCAs are well observed." (HSP5)

Barriers to ANC uptake: Self-perception of good health acted as a barrier, leading pregnant women to skip ANC visits when they perceived no health issues. Gender roles and competing household priorities contributed to women's lack of time for ANC services. Some health providers interpreted this as a lack of priority for women regarding these services, with a focus on household roles.

"They don't have good reasons to miss their clinic appointments, just give excuses. They don't take it seriously. They feel they just need the ANC booklet so they are not questioned at delivery." (HSP4)

Table 3:

Showing Comparison between Masaba North and Nyamira North at the Baseline

| | Sub-county | | Total | Chi-square Value | DF | p-value | OR | 95% Confidence Interval | | |
|------------------|---------------|--------------|------------|------------------|-------|---------|-------|-------------------------|-------|-------|
| | Nyamira North | Masaba North | | | | | | Lower | upper | |
| Actual Completed | Completed | 75 (42.1%) | 22(29.7%) | 97 | 3.397 | 1 | 0.065 | 1.72 | 0.963 | 3.076 |
| | Not completed | 103 (57.9%) | 52 (70.3) | 155 | | | | | | |
| Total | 178 | 74 | 252 | | | | | | | |

Table 4.

Comparison of Intervention and Control Groups Post-Intervention on ANC Contract Completion

| | Sub-county | | Total | Chi-square Value | DF | P-value | OR | 95% Confidence Interval | | |
|--------------|---------------|---------------|-------------|------------------|--------|---------|--------|-------------------------|-------|------|
| | Masaba North | Nyamira North | | | | | | Lower | Upper | |
| Focused ANC | Completed | 56 (77.8%) | 113 (45.6%) | 169 | 23.235 | 1 | <0.001 | 4.181 | 2.274 | 7.69 |
| | Not Completed | 16 (22.2%) | 135 (54.4%) | 151 | | | | | | |
| Total | 72 | 248 | 320 | | | | | | | |



Effectiveness of Intervention Tool

Baseline survey results: The completion of ANC contacts was assessed for both Masaba North and Nyamira North. No statistically significant difference was observed at baseline (p-value 0.065; OR 1.72, 95% Confidence Interval: 0.963 to 3.076) between Masaba North and Nyamira North regarding the completion of ANC contacts

Post-intervention results on implementation of packaged health message on ANC contacts Uptake: A statistically

Discussion

Healthcare providers reported that the first ANC attendance was the most preferred ANC contact by expectant women. They also noted that gaps in ANC uptake were attributed to ignorance of the importance of visiting a health facility for the recommended ANC visits. The study also found that expectant women with their first pregnancy were more motivated to attend all scheduled ANC visits. Health education was found to be an important requirement in enhancing compliance with recommended ANC contacts.

Data from the intervention site and control site were collected to determine similarities and differences. It was found that at baseline, there was no statistically significant difference between the two study sites (p-value 0.065; OR 1.72 95% Confidence Interval: 0.963 to 3.076). After intervention with a packaged health education, there was a statistically significant difference (P-value <0.001). Those in the intervention group were 4.2 times more likely to complete the recommended ANC contacts as compared to those in the control group (OR: 4.1881; 95%CI: 2.274 to 7.69).

The study findings were consistent with a study on determinants of antenatal care utilization in sub-Saharan Africa: a systematic review which found that primigravida were more motivated to attend ANC services. High parity or large household sizes had a significant reduction

significant difference was noted between the intervention group and the control group (P-value <0.001). In Masaba North (Intervention group), where a packaged health message was administered, individuals were four times more likely to complete ANC contacts compared to those in Nyamira North (Control group). Refer to Table 4 for detailed results. Out of the 327 participants, the outcomes of 7 clients were not recorded (missing) by the research assistants, resulting in 320 recorded client outcomes.

in the attainment of at least four ANC contacts in the course of pregnancy¹⁹. Therefore, providing continuous health education on the importance of initiating antenatal care visits early is an important segment of intervention¹⁸. If pregnant women received the same consistent health education on the benefits of ANC from health workers, community health volunteers (CHVs) and in other social gatherings, they may be more likely to take heed¹¹. Using reliable information improves health outcomes, tackling disparities, enhancing efficiency, and encouraging innovation¹². Sharing health messages have had better health indicators than those that do not¹³. In another study supporting health information as key to behaviour change in increasing ANC uptake, it was observed that lack of awareness and misconceptions about ANC could be addressed using information education and counselling sessions¹⁴.

The study findings were supported by Lassi¹⁰ who asserted that community-based interventions such as community support, mobilization, education and home visits by trained community health workers lead to significant reductions in maternal morbidity and neonatal mortality and an increase in referrals to a health facility. Lack of knowledge of the importance of seeking medical attention during pregnancy and labour is commonly believed to negatively influence health behaviour and decision-making processes.



This study demonstrated the importance of linking the expectant woman with the health care facility through accessing a packaged health message¹⁵. Single interventions such as packaged health message improves ANC coverage and deliveries in health facilities¹⁶. Health information combined with the introduction and promotion of birth plans during ANC increased its utilization¹⁷. This has had a direct positive effect on health service utilization and increasing democratization of reproductive health decisions¹⁸. As a predisposing factor, the role of high parity in reducing the odds of ANC attendance and initiation could have been because women who have had previous pregnancies may consider themselves ‘experienced’ and used to the routine care offered during ANC and so delay ANC initiation and number of ANC contacts made¹⁹.

One of the limitations of this study was the utilization of two sub-counties out of the five. One of the strengths of this study is that it was based on a study design that utilized an interventional group and a control group. This gave a clear picture that packaged health messages worked to improve ANC uptake. The intervention improved ANC services in Nyamira County, at an affordable cost since CHVs were used to disseminate ANC health information to the expectant women. The county will utilize these findings to improve maternal healthcare programs and policies.

Conclusion

In conclusion, a community-based strategy enhancing ANC follow-up contacts is key in achieving completion of ANC service contacts uptake. Lack of health promotion /education, high parity, lack of commodities and ignorance were the strongest independent factors associated with poor uptake of ANC services. Recognizing the importance of ANC contact compliance for expectant women, the intervention strategies should target the multiparous. More resources should therefore be

allocated to cater for the multiparous women. Strategies such as health education through community health volunteers will enhance ANC contacts. In addition, advocacy among young women to prevent non-compliance to required ANC contacts is required. The county government should support CHVs to reach the community with packaged ANC health messages. In addition to the current strategies for improving maternal health, the Ministry of Health and County governments should increase the awareness of focused antenatal care among women of reproductive age.

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