

# Patient and Obstetric Factors Influencing First Antenatal Care Visit among Pregnant Women in Embakasi North Sub-County Health Centres, Kenya

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## Abstract

**Background:** Globally, maternal mortality ratio has reduced by 45% but the mortality rate in Sub-Saharan Africa remains elusive. Antenatal care (ANC) is one of the most effective interventions in reducing maternal mortalities. In Nairobi County, ANC coverage stands at 33% with low ANC visits contrary to the WHO recommendation of four ANC visits. The study aimed to determine factors influencing first ANC visit among pregnant women. Specifically, patient-related factors and obstetric related factors on access to first ANC visit among pregnant women in Embakasi North Sub-County were evaluated.

**Methods:** In the year 2018, 368 pregnant women attending ANC in Kariobangi North health centre, Dandora 1 and Dandora 2 health centres were randomly selected. Factors influencing first ANC visit among pregnant women were determined. The study used a cross-sectional study design. A standardized questionnaire was used to collect information from the study participants and Focus Group Discussion (FGDs) formed. Statistical analyses were performed using SPSS and NVIVO software.

**Result:** The 368 participants responded 100% to the structured questionnaires. Majority of the study participants were aged between 35-39 years, followed by 34-34 years, then 25-25 years while the least was aged 40-44 years. Patient and obstetric factors were statistically significant in explaining the change in the first ANC visit ( $p < 0.05$ ). A significant positive influence on the first ANC visit was found on patient ( $\beta_1$ ) and obstetric ( $\beta_3$ ) related factors with regression coefficient values of,  $\beta_0=3.312$ ,  $\beta_1=0.752$ ,  $\beta_2=0.545$  and  $\beta_3=0.487$ . Among patient-related factors, Social Media Avenue contributed the most in providing ANC information (68%) while print media was the least at 42%. When asked reasons why pregnant women fail to seek ANC, financial constraints (78%), fear of disclosing pregnancy (56%), culture (40%), religion (38%), unplanned pregnancy (36%), fear of testing for HIV status (34%), limited Knowledge about ANC (33%), poor family and social support (44%), peer Influence (40%) and low decision-making authority (36%) were all statistically significant in accessing ANC services ( $p < 0.05$ ). Slightly over half of the mothers (52%) interviewed indicated that they had never had complications with their previous pregnancy and equally 52% had given birth 2-4 times, 34% had been pregnant once while 19% had been pregnant for  $>5$  times.

**Conclusion:** Patient and obstetric related factors influenced first ANC seeking behaviour among pregnant women in Embakasi North health centres. Patient-related attributes contributed more than the obstetric factors in access to the first ANC visit.

**Conclusion and recommendation:** This study showed that less than half of the participants had achieved continuum of care and education level, both respondents and husband occupation, parity, autonomy to health care decision, exposure to the mass media and wontedness of pregnancy were associated with completion of maternity continuum of care, therefore working on enhancing of the capacity of women autonomy in health care decision making and preventing unintended pregnancy helps to improve completion of maternity continuum of care.

**Keywords:** Antenatal clinic; Patient related factors; Obstetric related factors; Healthcare; Pregnant women; First ANC-visit

## Introduction

Maternal health is the care provided to the pregnant woman and the baby by a skilled healthcare professional while adhering to the best health conditions [1]. These care involves antenatal care (ANC) as a comprehensive package tool for preventive, diagnostic and health-care functions to maternal health aimed to minimize maternal deaths both directly and indirectly [2]. Goal 3 of the Sustainable Development Goals (SDGs) aims to reduce maternal health deaths by 70 per 100,000 birth lives by the year 2030 and this can only be realized through global, national and community-level initiative promoting ANC health delivery through universal healthcare. Death during pregnancy and maternal related complications are common with high staggering statistics of over 300,000 maternal deaths with nearly 100% of these deaths occurring in low-income settings [3, 4]. It is estimated that 830 pregnant women died daily in 2015 due to pregnancy complications and childbirth and among them, over 99% lived in low-resourced

setting [5]. In Kenya it is estimated that 8000 maternal deaths occur annually, much higher than maternal death reports in Uganda (5700), Rwanda (1100), Zimbabwe (2400) and South Africa (1500) [5]. Women living in low-resourced areas have more than 33 folds higher at risk of dying from a maternal-related cause during her lifetime unlike women living in high-resourced areas [5]. Risks, complications and deaths are higher among adolescent girls in third world countries whereby it is estimated that 1 in 180 pregnant adolescents aged 15

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years will die in such countries compared to 1 in 4900 in developed countries [6,]. Antenatal care contact is vital but the low intake among women of reproductive age in Africa is worrying. Statistics show that at least 69% of pregnant women achieve only one ANC visit against the WHO recommended four while globally only 64% of the women had attended all the four visits between the year 2007-2014 [1]. Up to 8 visits or more may be recommended during high-risk pregnancies and other pregnancy complications but empirical evidence shows that four visits are enough for uncomplicated pregnancies. Screening for maternal related diseases during ANC visits is paramount while malaria and HIV are associated with over 25% maternal deaths and near-misses [1, 7]. Direct obstetric causes have been reported to be a leading cause of maternal deaths accounting for 73% mortalities while indirect causes account for 27% [8]. Other related complications such as nutrition problems and a myriad of many other complications may go unnoticed if all ANC visits are not adhered. Practical models and policies that may be incorporated to region-specific may be a remedy to increase ANC up take among diverse communities in Sub-Saharan Africa where culture, religion, beliefs and communication barriers are key components to ANC underutilization [9].

## Methods

### Study site

The study was carried out in Embakasi North Sub-County in Nairobi County, Kenya, Three health centres within Embakasi North Sub-County were selected (Kariobangi North health centre, Dandora 1 and Dandora 2 health centres). The health centres were selected because Embakasi North Sub-County had the lowest ANC visits of pregnant women when compared amongst the other five Sub-Countries making Nairobi County, Kenya.

### Research design

A cross sectional study design approach was used. The study design enabled the researchers to be more informed on a situation at a given period of time.

### Target population

The target population included all the pregnant women visiting health centres in Embakasi North Sub County for the first time before they saw a clinician. Written informed consent was obtained from all the study participants.

### Inclusion criteria

The study included all pregnant mothers attending FIRST antenatal clinic in Kariobangi North health centre, Dandora 1 and Dandora 2 health centres in Embakasi North Sub County.

### Sampling design

Probability sampling technique was used where everyone in the target population had equal chance of participating. The target population was spread in three administrative wards and sampling frame was used to determine the sample size in each of the wards based on target population. Three facilities were used, one in each ward and in each facility a systematic random sampling was used where sample size was worked out and sampling interval determined. The  $n$ th number provided the number that was subjected to the interviews. Stratified random sampling was also used whereby stratification of the population was considered since pregnant women could be stratified into young and those who were attending the ANC visits for the 1st time without

previous pregnancy while the other strata consisted of those women who had another pregnancy before coming for the 1<sup>st</sup> time during the current pregnancy. From each strata, systematic random sampling was used to achieve the desired sample size.

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### Sample size determination

From the target population of 8,688 pregnant women seeking ANC services the sample size determination formula for estimating the population proportion with specified relative precision was applied while setting the  $\alpha$  at 0.05 and a detection rate of 50% among pregnant women of reproductive age in Embakasi North Health Centres, a total of 368 pregnant women were recruited to achieve 0.95 power. From the sample size of 368 pregnant women, stratified random sampling technique was used to determine sample size from each of the three health centres proportionate to the target population [10] (Table 1).

### Data collection instruments

The procedure that was used in data collection included structured questionnaires to collect quantitative data. Quantitative data was collected by conducting focused group discussion (FGDs).

### Validity

Pre-testing was conducted in the three hospitals prior to validate the research methods and tools.

### Data collection

Questionnaires were administered to the pregnant women upon consent at the ANC department before interacting with the clinicians. The questionnaires consisted of both open and closed-ended questions specific to the study objectives. With the help of research assistants, Focus Group Discussion forums were formed at a different section within the health facility. Each FGD composed of 5-8 participants. A

| Wards                          | Target Population | Sample size |
|--------------------------------|-------------------|-------------|
| Kariobangi North Health Centre | 3,567             | 151         |
| Dandora 1 Health Centre        | 2,689             | 113         |
| Total                          | 8,688             | 368         |

**Table 1:** Sampling frame from Specific Health Centres.

total of 10 FDGs were formed within the study period each lasting between 1 hour to 1½ h. A schedule designed to probe further and develop deeper insight on the study objectives was used during all FDG forums. Voice recording and note taking were the main methods used to collect the information from the study participants.

### Data analysis and presentation

The data collected was coded and entered in the computer for analysis using the Statistical Package for Social Science (SPSS). Data analysis procedures that were used included both qualitative and quantitative methods. Qualitative data was analyzed using content analysis by grouping the main themes of the respondents and use of N-vivo software. Quantitative data was analyzed using SPSS whereby descriptive statistics such as frequency, percentages, median and data presentation using, tables, pie charts and bar charts were used. Inferential statistics included regression analysis to perform the t, f-tests and assisted in establishing the effect of the factors on access to ANC visit among pregnant women.

### Ethical consideration

Ethical approval was granted by Mount Kenya University Ethics and Research Review Committee (MKU-ERC) MKU/ERC/0913 Research permit was given by the National Commission for Science Technology and Innovation (NACOSTI) NACOSTI/P/18/03459/25530. Permission was also given by the Nairobi County Commissioner, Nairobi County director of Health and Nairobi County director of Education. Further permit to collect data was given by the medical superintendents of the respective health centres within Embakasi North Sub-County. The study was performed in accordance with the Helsinki Declaration [11].

### Result

#### Demographic factors and access to first ANC services

The age distribution of the pregnant mothers interviewed at the time of ANC visit. The study participants were aged 35-39 years (25%), 30-34 years (23%), 25-29 years (17%), 20-24 years (13%), 15-19 years (12%) and 40-44 years (10%) respectively. Majority of the study participants had graduated from O-levels (42%), (33%) tertiary education and (25%) had some form of A-level education. Married women (44%) were the dominant among the study participants followed by those who were cohabiting (24%), single women (15%), separated (12%) and lastly women who had divorced (5%). Casual laborers accounted for the majority economic income source (26%) followed closely by women who were self-employed (26%) while 12% of all study participants were unemployed. On overall, the study showed a significant relationship between socio-demographic attributes with first ANC service ( $p < 0.05$ ) (Table 2).

#### Sources of information about Antenatal Care Services

The sources of information through which mothers learnt about ANC services. The study participants had diverse communication channels that they used to learn about ANC services which included social media platforms (68%), mass media-TV and Radio (62%), friends & relatives (45%) and by reading on print media (42%) (Table 3).

#### Patient related factors influencing access to ANC services

The main patient related factors identified by mothers which influenced them in accessing the first ANC services included, financial constraints (78%), fear of disclosing pregnancy (56%), culture (40%), religion (38%), unplanned pregnancy (36%), fear of testing for HIV status (34%), limited knowledge about ANC (33%), poor family and social support (44%), peer Influence (40%) and low decision-making authority (36%). The study further determined that there is a significant relationship between patient related factors and access to first ANC services in Embakasi North Sub County ( $\chi^2 = 14.294$ ,  $df=6$ ,  $p < 0.032$ ) (Table 4).

#### Obstetric related factors influencing access to ANC services

The study participants were asked on obstetric attributes that could have influenced access of ANC services. The three main obstetric related factors analyzed included gravidity, parity and complications during previous pregnancies. The number of times the mothers had been pregnant (gravidity). Most of the mothers (48%) had been pregnant for two to four times, 34% had been pregnant once while 19% had been pregnant for over five times.

Further on parity, 52% of the study participants had given birth 2-4 times, 32% had given birth once while 32% of the mothers interviewed indicated that they had given birth five times as shown in (Figure 1, 2).

In addition, slightly over half of the study participants (52%) indicated that they had never had complications with their previous pregnancies. However, nearly half (48%) of the mothers in the study indicated that they had complications with their previous pregnancies (Figure 3).

#### Coefficient of determination

In general, at 5% level of significance, patient and obstetric attributes (independent variables) were statistically significant in explaining change in first ANC visit ( $P < 0.05$ ). From the regression model and statistical analysis, a unit increase in the patient related factors led to 0.545 increases in first ANC visit among women of reproductive age and a unit increase in the obstetric related factors led to 0.487 increases in first ANC visit among pregnant women (Table 5).

### Discussion

In our study, age was a significant factor among pregnant mothers seeking first ANC services in line with results reported by different researchers on similar studies elsewhere [12]. Majority of the women were beyond 30 years during their 1<sup>st</sup> ANC visit while the finding that only a few pregnant women (12%) aged below 19 years may be attributed due to the implementation of the National Adolescent Sexual and Reproductive Health Policy (2015), legal implications pertaining sexual activities with pedophiles (<18 years) as prescribed in the Sexual Offences Act (2014), Children Act (2012) and the Marriage Act (2014) [13]. All pregnant women in this study had achieved some form of education and it can therefore be deduced that the study participants were informed on the importance of ANC. Studies have documented a correlation of health seeking behavior during pregnancy with education

|                    | Details       | Frequency  | Percent    | Significance      |
|--------------------|---------------|------------|------------|-------------------|
|                    |               |            |            | (p-Value)         |
| Age                | 15-19 years   | 44         | 12         | $\chi^2 = 11.456$ |
|                    | 20-24 years   | 48         | 13         |                   |
|                    | 25-29 years   | 63         | 17         | df=3              |
|                    | 30-34 years   | 85         | 23         |                   |
|                    | 35-39 years   | 92         | 25         | p=0.025           |
|                    | 40-44 years   | 36         | 10         |                   |
|                    | 45-49 years   | 0          | 0          |                   |
|                    | <b>Total</b>  | <b>368</b> | <b>100</b> |                   |
| level of education | Primary       | 92         | 25         | $\chi^2 = 4.364$  |
|                    | Secondary     | 155        | 42         | df=4              |
|                    | College       | 121        | 33         | p=0.001           |
|                    | <b>Total</b>  | <b>368</b> | <b>100</b> |                   |
| Marital status     | Single        | 55         | 15         | $\chi^2 = 5.321$  |
|                    | Married       | 162        | 44         |                   |
|                    | Separated     | 44         | 12         | df=3              |
|                    | Cohabiting    | 89         | 24         | p=0.003           |
|                    | Divorced      | 18         | 5          |                   |
|                    | <b>Total</b>  | <b>368</b> | <b>100</b> |                   |
| Employment status  | Unemployed    | 44         | 12         | $\chi^2 = 4.659$  |
|                    | Employed      | 74         | 20         | df=3              |
|                    | Self employed | 96         | 26         | p=0.025           |
|                    | Casual labor  | 154        | 42         |                   |
|                    | <b>Total</b>  | <b>368</b> | <b>100</b> |                   |
| Religion           | Christian     | 251        | 68         | $\chi^2 = 14.206$ |
|                    | Muslim        | 74         | 20         | df=4              |
|                    | Others        | 43         | 12         | p=0.134           |
|                    | Total         | <b>368</b> | <b>100</b> |                   |

Table 2: Demographic factors and access to first ANC services.

|   | Frequency | Percent |
|---|-----------|---------|
| Through friends and relatives                               | 166       | 45%     |
| During a visit to health institution                        | 192       | 52%     |
| Through the mass media –TV, Radio,                          | 228       | 62%     |
| Through social media platforms                              | 250       | 68%     |
| Reading on print media e.g. fliers, newspaper and magazines | 155       | 42%     |

Table 3: Sources of information about Antenatal Care Services.

|                                | Frequency | Percent | Significance      |
|--------------------------------|-----------|---------|-------------------|
|                                |           |         | (p-Value)         |
| Unplanned pregnancy            | 133       | 36%     | $\chi^2 = 14.294$ |
| Cultural factors               | 148       | 40%     |                   |
| religious factors              | 140       | 38%     | df=6              |
| Financial constraints          | 288       | 78%     |                   |
| fear of disclosing pregnancy   | 207       | 56%     | -                 |
| fear of testing for HIV statUS | 125       | 34      | p=0.032           |
| limited Knowledge about ANC    | 122       | 33      |                   |
| poor family and social support | 162       | 44      | -                 |
| peer Influence                 | 148       | 40      | -                 |
| low decision-making authority  | 133       | 36      | -                 |

Table 4: Patient related factors influencing access to ANC services.

| Model          | Unstandardized Coefficients |            | Standardized Coefficients | t     | Sig.   |        |
|----------------|-----------------------------|------------|---------------------------|-------|--------|--------|
|                | B                           | Std. Error | Beta                      |       |        |        |
|                | Constant                    | 3.312      | 0.328                     |       | 10.089 | 0      |
| X <sub>1</sub> | facility related factors    | 0.752      | 0.1032                    | 0.152 | 4.223  | 0.0179 |
| X <sub>2</sub> | patient related factors     | 0.545      | 0.2178                    | 0.116 | 3.936  | 0.0251 |
| X <sub>3</sub> | obstetric related factors   | 0.487      | 0.3425                    | 0.054 | 3.724  | 0.0269 |

Table 5: Coefficient of Determination.

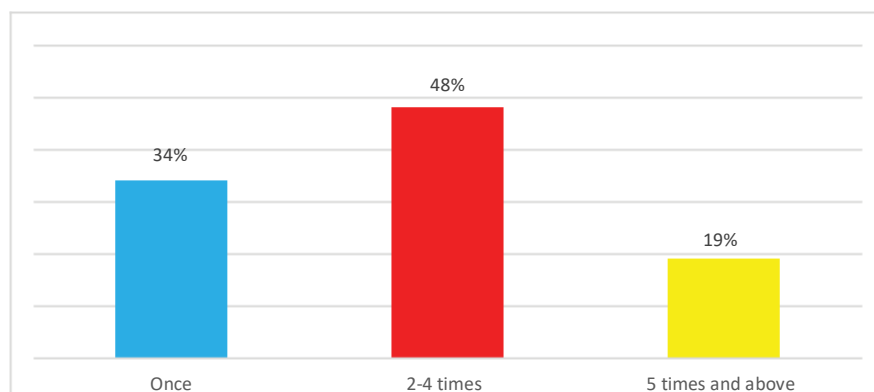


Figure 1: Number of times the mother had been pregnant (Gravidity).

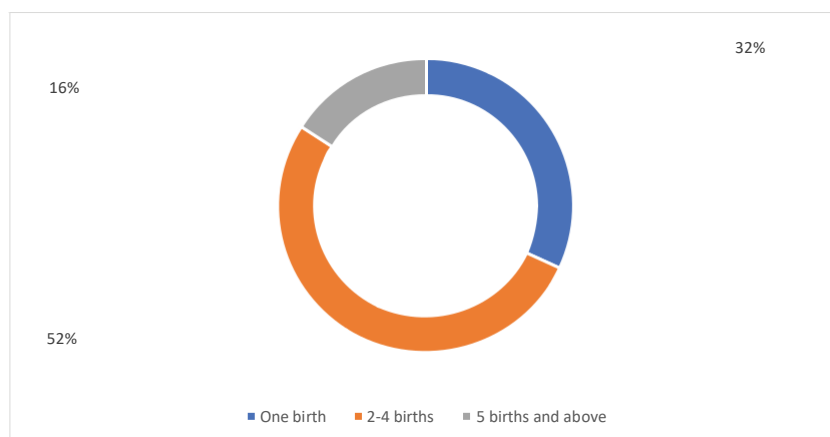


Figure 2: Number of children the mother has given birth (Parity).

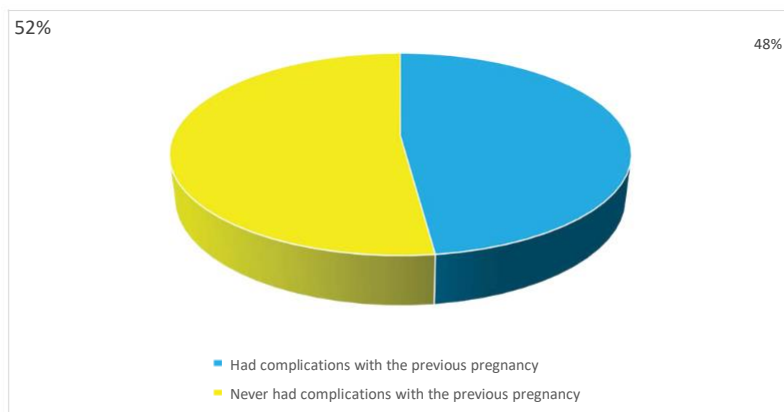


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level [14]. Marital status is a key indicator on ANC visits and our data showed that pregnant women who were married dominated and may be attributed to husband's support and financial stability. Husband's employment status influenced maternal healthcare among pregnant women in Bangladesh and a husband was also found mainly to provide financial support to their pregnant wives in Rwanda [12,15]. Antenatal services in Kenya are free but majority of the study participants (78%) felt that financial constraints inhibited them from attending all ANC visits due to some indirect fee charges such as transport and laboratory tests.

While the minority was either single or divorced in the current study, a study was able to demonstrate that women's autonomy had a positive influence on maternal health and were able to make ANC decisions without external forces. The place of residence, whether urban or rural has been associated with ANC attendance and information access [16, 17]. Increased access to technology infrastructure in urban and rural Kenya across all age groups has not only eased service delivery but speedy access of information through social and mass media which were the major avenues on ANC information access in our study. A study in Nepal found that mothers living in urban areas were more exposed to general media and were more likely to receive good quality ANC services [18]. The current study participants were delivered from urban or semi-urban areas who were likely having internet access, radios or televisions.

Cultural related factors and societal values were key components significant to first ANC attendance among the study participants. Kenya has diverse communities with different deep-rooted cultural norms and values whereby unwanted and mistimed pregnancies are associated with poor ANC attendance [19]. Testing for Sexually Transmitted Diseases (STDs) such as Syphilis and HIV are key components of ANC and majority of the study participants stated that they were afraid of disclosing their HIV status or pregnancy. A study in Zambia found a positive predictor to focused ANC if mothers were to be done a HIV test and other preventive treatments [17]. Community diversity has been associated with poor maternal health in Africa and among immigrant women who may be afraid to disclose certain information even to skilled health professionals for fear of discrimination and stigmatization [12, 20].

Obstetric related factors were found significant to ANC access in the current study. Majority of the women studied stated that they had 2-4 births (parity) and previous studies have shown lower parity to be associated with frequent ANC visits and less adverse outcomes [15, 21]. Parity was also a predictor indicator for maternal health care seeking behavior in rural Tanzania as well as women attendance to ANC in Ethiopia [14, 16]. Complications may arise during pregnancy or delivery and nearly half of the study participants indicated that they previously had a pregnancy-related complication. Forty (40%) of pregnant women experience some form of complication 15% being life-threatening [22]. Antenatal visits enhance health professionals determine the level of care and skills required by the health care-provider so that the best and safest options available are offered. Skilled birth attendants have been documented to greatly minimize maternal deaths [3]. In Kenya,

53% of the births were attended by skilled health personnel (doctors, nurses or midwives) in the year 2015 but the situation may worsen due to acute shortage of skilled labour of health professionals in the country [5]. In the KDHS (2008/9) data, when other factors were adjusted, it was found that women whose husbands attended at least one ANC visit were more likely to have a skilled-birth attendance [23]. Skilled assistance in a health facility was viewed positively in Western Kenya, but a previous study within the same region had indicated that 80% of women had delivered away from health care facility with assistance of traditional birth attendants [24, 25].

## Conclusion

Patient related factors (demography, cultural, economic & information source) and Obstetric related factors (gravidity, parity & previous pregnancy complications) were statistically significant in explaining change in first ANC seeking behavior among women of reproductive age in Embakasi North in Nairobi County, Kenya. These factors are attributes that positively influence ANC access among pregnant women in Embakasi North Sub-County, Kenya. It is known that low ANC uptake among pregnant women is associated with adverse pregnancy related complications and high maternal mortality rates. The data derived from this study provide vital information on factors that influence the recommended 4 ANC visits among Embakasi women and therefore triggers public health action strategies to prevent severe adverse effects during pregnancy. Sensitization by healthcare workers on the importance of all ANC visits, ANC visit follow-ups, transport support by the County Government and other actors such as prompt and affordable provision of ambulance services are key factors that can improve ANC uptake among the pregnant women in Embakasi Sub County in Nairobi County, Kenya.

## Declarations

### Competing interests

The author declares no competing interest

### Authors' contributions

Moses Wamwea Muraguri was the principal investigator and was involved in all stages of the study which included conceptualization, proposal writing, methodology, data collection, and formal data analysis. Esther Ndonga and Joseph Juma Nyamai were involved in the entire supervision of the study. Oliver Waitthaka Mbuthia participated in data analysis, developed the initial manuscript, reviewed and edited the manuscript for submission. All authors gave their expert reviews and gave approval for the manuscript publication.

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## Authors' contributions

Moses Wamwea Muraguri was the principal investigator and was involved in all stages of the study which included conceptualization, proposal writing, methodology, data collection and formal data analysis. Esther Ndonga and Joseph Juma Nyamai were involved in the entire supervision of the study. Oliver Waitthaka Mbuthia participated in data analysis, developed the initial manuscript, reviewed and edited the manuscript for submission. All authors gave their expert reviews and gave approval for the manuscript publication.

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