

Role of Social Network Structures on Birth Attendant Decisions Among Women in Nakuru County, Kenya

Mungai Mwangi¹, Dr. Mary Gitahi², Dr. George Evans Owino³

¹Research Manager, Innovations for Poverty Action, Kenya, Address: P.O. Box 72427 - 00200 Nairobi, Kenya

²Lecturer, Department of Community Health and Epidemiology, Kenyatta University, Kenya, P.O. Box 43844-00100, Nairobi, Kenya

³Lecturer, Department of Sociology, Gender Development and Studies, Kenyatta University, Kenya, P.O. Box 43844-00100, Nairobi, Kenya

Corresponding Author: Mungai Mwangi

DOI: <https://doi.org/10.52403/ijhsr.20221124>

ABSTRACT

Introduction: Three-fourths of maternal deaths occur from direct obstetric complications. These life-threatening pregnancy-related outcomes are avoidable through ensuring that mothers have access to adequate and proper maternal health services and prompt management of any complications during pregnancy or childbirth process. This study examined the relationship between social network structures and birth attendant decisions among women in Nakuru County, Kenya.

Methods: The study applied a mixed-method approach that employs a convergent parallel design. Interviewer administered questionnaires and semi-structured interviews were used to collect quantitative and qualitative data among women of birth giving age and community health workers (CHWs) respectively. Chi-square tests for independence were used to assess whether the dependent variable and categorical independent variables are independent at $p < 0.05$ significance levels. Binomial logistic regression technique was employed to identify variables that are likely to be essential predictors for the dependent variable. Qualitative data from in-depth interviews with key informants was analyzed through content analysis using NVivo 10.

Results: About 55% of the women were embedded in homogeneous networks, 76% had high Skilled Birth Attendants (SBA) endorsement networks, and the average number of social networks was 2.4 (SD=1.1, median = 2). There was no significant relationship between social network size and birth attendant decision ($\chi^2(2)$, $p=.072$). There was, however, a significant relationship between social network content and birth attendant decision ($\chi^2(1)=55.604$, $p < 0.001$). Social network homogeneity was also strongly related to birth attendant choice ($\chi^2(1)=21.152$, $p < 0.001$). Women embedded in social networks with high SBA endorsement had 5.28 higher odds of giving birth in a health facility than their counterparts embedded in low SBA endorsement. Those embedded in a homogeneous network had a 70% reduction in odds of facility delivery.

Conclusion: According to the study findings, social networks can either facilitate or constrain facility utilization during birth, and thus health education and mother mobilization interventions promoting facility birth should leverage on the role of social networks.

Keywords: social networks, mixed methods, birth attendant decisions, skilled birth attendants

INTRODUCTION

Reducing maternal and newborn mortality and morbidity is still a key public health priority in many countries in sub-Saharan

Africa (SSA)(1). Despite the efforts and successes in addressing issues surrounding maternal mortality, it remains a universally recognized challenge of public health. SDG

3.1 aspires to ensure that no country has an MMR that is more than twice the global mean, and to reduce MMR globally to under 70/100,000 live births by 2030(2)

Kenya's MMR remains high at 342/100,000 live births, with a 1 in 76 lifetime risk of maternal death (2). According to the Nakuru County's Health Department, the County has MMR rate and skilled delivery rates of 191/100,000 livebirths and 66.7%, respectively(2). While this is an improvement from the previously reported MMR rate of 374/100,000 live births as well as a skilled delivery rate of 63% (3), the skilled delivery rate is way below the County's target of 80% by 2022 as indicated in the Nakuru CIDP 2018-2022.

Empirical evidence has shown that community and household characteristics play a critical role in the utilization of maternal healthcare services in the developing world (4). Edmonds, Hruschka, Bernard, & Sibley (5) postulate naturally occurring social networks are critical to health outcomes in LMICs and serve as the principal source of the various resources in the extended webs of social ties. Social networks have been demonstrated to have vital influence on health-market outcomes for their ability to transmit knowledge on health-related issues.

Healthcare seeking behavior is influenced by social interconnections through a variety of channels, including, for example, through facilitating transmission of norms and values, and information spillovers. While empirical evidence illustrates the influence of social networks on most individual and economic outcomes (6), information on its effect on birth attendant decisions is scant as this area is still relatively unexploited. This study advances research on the role of social networks in understanding birth attendant decisions

Kenya ranks among the countries with the highest maternal deaths burden worldwide – with maternal deaths accounting for fourteen per cent of deaths of women of ages 15-49(3). The Kenya government has made some significant effort geared towards

the reduction of maternal deaths such as the 2013 declaration on free maternal services in all public institutions across the country. Despite all national efforts to enhance use of SBAs, maternal and neonatal morbidity and death indices have showed little to no improvement. This makes it critical to investigate measures that would strengthen the utilization of health-care systems through interventions designed to improving utilization of maternal health services.

In spite of the recognition on essentiality of utilization of SBAs when making birth attendant decisions, little is known about the roles of interpersonal interactions on birth attendant decisions. Other studies have shown that interpersonal interactions can either facilitate or inhibit healthcare utilization, including maternal services (7). The significant role of social networks cannot be ruled out as indicated in other studies (8). This study seeks to close this lacuna in knowledge and aim to provide health practitioners and planners with information when designing specific interventions aimed at encouraging more expectant women to seek skilled birth attendants at a critical time in their lives, in this case when making the birth attendant decisions, with a specific focus on Nakuru County.

Objectives of the Study

The specific objectives of the study were to:

1. To investigate the relationship between network size and birth attendant decisions among women of reproductive age in Nakuru County.
2. To examine the relationship between social network content and birth attendant decisions among women of reproductive age in Nakuru County.

To investigate the relationship between social network homogeneity and birth attendant decisions among women of reproductive age in Nakuru County.

MATERIALS AND METHODS

A convergent parallel design, a mixed-methods design that consisted of a

structured questionnaire and in-depth interviews was adopted in the study. Quantitative data from eligible mothers was obtained through a structured interviewer-administered questionnaire. Qualitative data was collected through key informant interviews with Community Health Workers.

Study Population

The study population comprised women of ages 15-49 in Nakuru County, Kenya who bore children within twelve months prior to the survey. Community Health Workers formed part of the study population as the key informants.

Data analysis

The quantitative data was processed and analyzed using STATA 17.1 (9). Descriptive statistical analysis was employed to describe the study sample's background characteristics, with frequencies and percentages generated and presented on graphs and tables. Chi-square tests were conducted to assess whether the dependent variable and categorical independent variables were significant at $p < 0.05$ significance levels. Binomial logistic regression technique was employed to find variables that were likely to be essential predictors for the dependent variable. Qualitative data was transcribed and analyzed by thematic analysis using NVivo

10. The researcher identified direct quotes and looked for repetition, the use of meaning intensifiers, and the number of respondents expressing similar ideas. Descriptive data obtained from the qualitative analysis provided further interpretation of the quantitative data.

RESULTS

Demographic characteristics of the sample:

Table 1 illustrates the demographic characteristics of the sample. The mothers interviewed ranged in age from 15 to 47, with an average age of 27.8 years (SD 6.4). Thirty-eight percent (n=142) of the mothers were between the ages of 15 and 24, while 43% (n=159), 18% (n=67), and 1% (n=2) were between the ages of 25 and 34, 35-44, and over 45, respectively. Fifty percent (n=185) of the mothers were married, 49% (n=181) were single, 3% (n=3) were separated and 1% (n=1) were widowed. Only 35% of the mothers interviewed had a high school education or higher and only 16% were employed. Respondents were asked about the location of their most recent delivery and 65% (n=240) of the mothers reported to have delivered under skilled attendance. Forty two percent of the mothers were first time mums with 46% (n=170) and 12% (n=46) reporting to have 2-3 and more than 3 previous births respectively.

Table 1: Social Network Size and Birth Attendant Decisions

| Age: | Home Birth | Facility Birth | Total | X ² |
|----------------------------------|-------------|----------------|------------|---|
| 15-24 years (n=142) | 44 (31%) | 98 (69%) | 142 (38%) | X ² (3)= 9.084, p=.028 |
| 25-34 years (n=159) | 51 (32.1%) | 108 (67.9%) | 159 (43%) | |
| 35-44 years (n=67) | 34 (50.7%) | 33 (49.3%) | 67 (18%) | |
| Over 45 years (n=2) | 1 (50%) | 1 (50%) | 2 (1%) | |
| Total (n=370) | 130 (35.1%) | 240 (64.9%) | 370 (100%) | |
| Marital status: | | | | |
| Single (n=181) | 124 (68.5%) | 57 (31.5%) | 181 (49%) | X ² (3)= 173.184 p<.001 |
| Married /Living together (n=188) | 6 (3.2%) | 179 (96.8%) | 185 (50%) | |
| Separated/Widowed (n=4) | 0 (0%) | 4 (100%) | 4 (1%) | |
| Total (n=370) | 130 (35.1%) | 240 (64.9%) | 370 (100%) | |
| Education: | | | | X ² (1)= 101.344 , p<.001 |
| Primary education (n=242) | 129 (53.3%) | 113 (46.7%) | 242 (65%) | X ² (1)= 29.264, p<.001 |
| High school and above (n=128) | 1 (0.8%) | 127 (99.2%) | 128 (35%) | |
| Total (n=370) | 130 (35.1%) | 240 (64.9%) | 370 (100%) | |
| Employment status: | | | | |
| Currently unemployed (n=309) | 127 (41.1%) | 182 (58.9%) | 309 (84%) | X ² (1)= 29.264, p<.001 |
| Currently employed (n=61) | 3 (4.9%) | 58 (95.1%) | 61 (16%) | |
| Total (n=370) | 130 (35.1%) | 240 (64.9%) | 370 (100%) | |

Respondents were asked to identify and list people they interact with on a regular basis particularly those whom they were in constant communication with in their most recent birth experience. The number of social networks reported ranged between 1 and 5, with a mean of 2.4, standard deviation of 1.1 and a median of 2. The results show that those who had home births had a slightly higher mean number of social networks ($M= 2.03, SD=1.09$) than those who had facility births ($M= 1.74, SD=1.0$).

The continuous variable of network counts was summarized to a categorical variables with three categories; 1 - 2 network members, 3 - 4 network members and 5 or more network members. Table 2 indicates that seventy seven percent (n=282) of the respondents had between one and two network members, 21% (n=76) had 3-4 network members while only 2% (n=7) reported to having had more than 5 members in their networks.

Table 2: Respondent Distribution By Network Characteristics

| Social Network Size: | Home Birth | Facility Birth | Total | χ^2 |
|------------------------------------|------------|----------------|-------------|---------------------------|
| 1 - 2 network members (N=282) | 92 (70.8%) | 190 (80.9%) | 282 (77.3%) | $\chi^2(2)=5.27, p=.072$ |
| 3 - 4 network members (N=76) | 34 (26.2%) | 42 (17.9%) | 76 (20.8%) | |
| 5 or more network members (N=7) | 4 (3.1%) | 3 (1.3%) | 7 (1.9%) | |
| Total (N=365) | 130 (100%) | 235 (100%) | 365 (100%) | |
| Social Network Homogeneity: | | | | |
| less homogenous network (N=168) | 38 (29.2%) | 130 (55.3%) | 168 (46.0%) | $\chi^2(1)=22.93, p<.001$ |
| homogenous network (N=197) | 92 (70.8%) | 105 (44.7%) | 197 (54.0%) | |
| Total (N=365) | 130 (100%) | 235 (100%) | 365 (100%) | |
| Social Network Content: | | | | |
| Low SBA endorsement (N=90) | 61 (46.9%) | 29 (12.3%) | 90 (24.7%) | $\chi^2(1)=53.88, p<.001$ |
| High SBA endorsement (N=275) | 69 (53.1%) | 206 (87.7%) | 275 (75.3%) | |
| Total (N=365) | 130 (100%) | 235 (100%) | 365 (100%) | |

The study hypothesized that social network size is not significantly related to birth attendant decisions among women of reproductive age in Nakuru County. To test this hypothesis, women were asked a name generator question where they were asked to identify and list people kin or non-kin who they interacted with on a regular basis

particularly with reference to their most recent birth experience. A cross tabulation of social network size and the dependent variable, birth attendant decision, showed there was no significant relationship between the size of the social network and birth attendant decision ($\chi^2(2) = 5.2725, p=.072$).

Table 3: Cross Tabulation - Social Network Size and Birth Attendant Decision

| Social Network Size | Home Birth | Facility Birth | % |
|---------------------------|------------|----------------|------|
| 1 - 2 network members | 92 | 190 | 77.3 |
| 3 - 4 network members | 34 | 42 | 20.8 |
| 5 or more network members | 4 | 3 | 1.9 |
| Total (N=365) | 130 | 235 | |

According to the cross-tabulation results, table 3, 97% (n=358) of respondents had four or fewer members in their social networks. Only 19% (n=45) of those who had a facility birth had three or more network members, compared to 29% (n=38) of those who had home births. The results indicate that those who had home births had more members embedded in their social networks than those who had facility births. However, this is most likely due to chance, as additional statistical tests indicate that

social network size is not significantly related to birth attendant decisions. As a result, we cannot reject the null hypothesis.

Social Network Content and Birth Attendant Decisions

The study hypothesized that social network content is not significantly related to birth attendant decisions among women of reproductive age in Nakuru County. The results from the cross tabulation of social network content and birth attendant decision

indicated that 68% (n=61) of those who had a home birth had a low SBA endorsement from their networks compared to 32% (n=29) among their counterparts who had a facility birth. In contrast, Table 4 indicates that 75% (n=206) of those who gave birth at a health facility had high SBA endorsement compared to 25% (n=69) who delivered at facility but had high SBA endorsement from their network contacts.

Table 4: Cross tabulation: social network content and birth attendant decision

| Social Content | Network | Home Birth | Facility Birth | Total |
|----------------------|---------|------------|----------------|-------|
| Low SBA Endorsement | | 61 (68%) | 29 (32%) | 90 |
| High SBA Endorsement | | 69 (25%) | 206 (75%) | 275 |
| Total (N=365) | | 130 | 235 | 365 |

A test for association between the two variables, social network content and birth attendant decision, indicated there was a significant relationship between the two variables ($\chi^2(1)=53.88$, $p<.001$). The bivariate analysis results show that SBA endorsement significantly predicted birth attendant decision, with those who received high SBA endorsement from their social networks more likely to give birth in a health facility than those who received low SBA endorsement. The findings therefore demonstrate that birth attendant decisions can be explained by social networks content due to the significant association between social network content and birth attendant decision. We therefore reject the null hypothesis which indicated that social network is not significantly related to birth attendant decisions among women of reproductive age in Nakuru County.

Similar results were found in the qualitative part of the study where the participants mentioned that social network do play a significant role when it comes to the choice of birth attendants among women of birth giving age. Majority of the CHWs reported that social networks were a great source of advice to women such as recommendations on which facilities to go to, nutritious meals to consume as well as on preparation for the delivery. In the text below, CHWs described

the level of advice women receive from their social networks.

Participant A noted that, "Mothers also receive distorted negative information about things like forced cesarean section in some facilities. Such information creates fear among the mothers leading to some of them preferring to deliver from home as they are uncomfortable of having someone perform c-section interventions, which they are told are very painful and even take very long to heal."

Participant B stated that, "People share ideas with the mothers including why it would be safe to go to a facility instead of delivering at home. In return, this helps the mothers make an informed choice on the preferred type of birth attendant."

Participant C stated that, "Mothers share notes and ideas particularly with those who had recent births who may not be necessarily their kins or better than them financially. The key determinant on who the mother goes to for advice is dependent on how strong their network ties are."

Participant D alluded that, "Maternity should only be secluded for trained practitioners because this information spreads and will eventually scare other mothers away because mother do share and seek information before making decision about their birth attendant."

From the participants interviews it was evident that though there are other forms of support such as financial support or assistance with chores that mother receive from their social networks, the social networks largely provide women with advice and birth attendant recommendations based on their personal experiences.

Social network homogeneity and birth attendant decisions

Homogeneity was assessed though determining kinship composition of the respondents social network. Social network was considered as homogenous if it comprised of kinship members specifically parents and relatives who had biological relationships. The summary measure of

social network homogeneity was calculated by dividing the total number of people identified as kin by the total number of people in the respondent's network. This yielded a final network homogeneity score ranging from 0 (no kin individuals in the respondent's network) to 1 (respondent had an all-kin network).

Table 5: Cross Tabulation - Social Network Homogeneity and Birth Attendant Decisions

| Social Network Homogeneity | Home Birth | Facility Birth | % |
|-----------------------------------|-------------------|-----------------------|----------|
| Less Homogenous Network | 38 | 130 | 46.0 |
| Homogenous Network | 92 | 105 | 54.0 |
| Total (N=365) | 130 | 235 | |

A test for association between the two variables, social network homogeneity and birth attendant decision, indicated there was a significant relationship between the two variables ($\chi^2(1)=22.93$, $p<.001$). From the cross tabulation, Table 5, 71% (n=92) of home births were among respondents embedded in homogenous networks, compared to 46% (n=110) of facility births among the respondents embedded in homogenous networks.

The findings show that social network homogeneity can help explain birth attendant decisions, as they demonstrate that respondents who were embedded in more kinship networks were less likely to use health facilities for delivery compared to their counterparts in less homogeneous networks who were more likely to use health facilities. Based on these findings, we therefore reject the null hypothesis which indicated that social network homogeneity is not significantly related to birth attendant decisions among women of reproductive age in Nakuru County.

Interviews with CHWs also revealed that social network homogeneity influences birth attendant decisions. Below quotes are sentiments from participants in the semi-structured interviews.

Participant F noted that *“Non-kins are likely to influence mothers’ birth attendant*

decisions. They do this through sharing their past personal experience with specific facilities and the treatment they received from the nurses. The mothers are unlikely to return or go to a facility that has ever been reported to have maternal deaths by anyone in their social networks.”

Another participant K stated that *“Social networks affect negatively because there are cases where the mothers are referred and influenced to go to a traditional birth attendant who are not skilled birth attendants which may result in risky delivery and poor services. This is actually seen among those who live with their mothers in law.”*

Participants frequently described how kin and non-kin networks can influence birth attendant decisions, with interaction with mothers-in-law repeatedly mentioned of playing a dominant role.

Logistic Regression Analysis

To better understand the relationship between the dependent and independent variables in the social network, independent variables with p-values less than 0.1 were subjected to a second logistic regression that adjusted for specific individual level factors that were consistently associated with birth attendant decisions in the literature. The logistic regression model results in table 4.6 showed that women immersed in social networks with high SBA endorsement had 5.28 times the odds of giving birth at a health facility than their counterparts embedded in low SBA endorsement.

On the other hand, table 6 illustrates that the odds of facility delivery among women who were embedded in homogeneous networks shrunk by a factor of 0.30. This means that a mother who is embedded in a homogenous network experiences a reduction of 70% in the odds of having a facility delivery compared to a mother embedded in heterogeneous networks.

Table 6: Summary of Logistic Regression Analysis

| Predictor | Adjusted Odds Ratio | P-Value | Lower Bound | Upper Bound |
|---------------------------|---------------------|---------|-------------|-------------|
| Respondent Age | 0.93 | 0.05** | 0.87 | 1 |
| Currently Unemployed | 1 | . | 1 | 1 |
| Currently Employed | 5.27 | 0.24 | 0.33 | 84.93 |
| Primary Education | 1 | . | 1 | 1 |
| High School And Above | 88.67 | 0.00*** | 7.23 | 1086.61 |
| Respondent Age | 0.93 | 0.05** | 0.87 | 1 |
| Single | 1 | . | 1 | 1 |
| Married / Living Together | 31.48 | 0.00*** | 9.57 | 103.58 |
| Rural | 1 | . | 1 | 1 |
| Urban | 32.8 | 0.00*** | 3.4 | 316.42 |
| Low SBA Endorsement | 1 | . | 1 | 1 |
| High SBA Endorsement | 5.28 | 0.00*** | 2.03 | 13.75 |
| Less Homogenous Network | 1 | . | 1 | 1 |
| Homogenous Network | 0.3 | 0.01*** | 0.12 | 0.71 |
| Observations | 361 | | | |
| Wald Chi2(7) | 70.2 | | | |
| Prob > Chi2 | 0.0000 | | | |
| Log Pseudolikelihood | -64.018728 | | | |
| Pseudo R2 | 0.7286 | | | |

Note: Entries with 1 AOR are the base/reference categories; *** p<.01, ** p<.05, * p<.1

DISCUSSION

Influence of Social Network Size Birth Attendant Decisions

The study hypothesized that social network size is not significantly related to birth attendant decisions to determine the role of social networks on birth attendant decisions. The study's findings revealed no significant relationship between social network size and birth attendant decisions.

According to the Network Episode Model, social influence among individuals operates by taking the decision out of the individual's hands and placing it on social networks, or by acting as a utility for individual choices. According to this model, social network size should have had a greater explanatory value on the role of social networks. This contradicts the study findings and the plausible explanation for this could be due to the study's retrospective nature, which requires mothers to recall their network members for an event that happened close to a year ago, which could be susceptible to memory lapses.

Additionally, the nature of the interaction was not clearly defined in the name generator question. As a result, it is very likely that mothers interpreted interaction as face-to-face, and the reported network size numbers may have excluded non-face-to-face interactions. Other unobserved effects, such as community variation, could explain

the lack of explanatory power from social network sizes as expected in the NEM.

Influence of Social Network Content on Birth Attendant Decisions

The findings of this study revealed a significant relationship between social network content and birth attendant decision-making, with mothers with high SBA endorsement having 5,28 times the odds of delivering in a health facility compared to their counterparts with low SBA endorsement. The findings build on previous research that found social network content to significantly promote health behaviors (10–12).

Similarly, informants in the qualitative component of the study stated that information provided in social networks has a significant influence on birth attendant decisions. Based on their personal experiences, network members provide advice and recommendations to pregnant mothers on key aspects ranging from referral to recommendations for birth attendants. According to the majority of informants, social networks also provide more granular information on facility delivery, such as reported cases of maternal deaths and the quality of care provided by facility providers.

The qualitative findings also revealed health providers' proxy role in ensuring birth

facility utilization. The findings indicate that information from mothers who give birth in health facilities, particularly information about the characteristics of healthcare providers, influences health facility utilization to some extent. These findings highlight the critical role of social networks in providing information exposure and social learning through interactions and conversation, thereby reducing uncertainty and leading to behavior adoption by women(13), regardless of whether the advice supports home or facility delivery.

Social Network Homogeneity on Birth Attendant Decisions

Findings from this study indicate that a mother who is embedded in a homogeneous network has a 70% lower chance of having a facility delivery than a mother who is embedded in heterogeneous networks. The findings build on the findings of a previous study on the effect of kinship networks on women's contraceptive choice in rural Thailand, in which Godley (14) found that extended kinship connections influenced contraceptive choice - the more external kinship relations a household had, the more likely women were to use modern forms of temporary contraception.

From the qualitative interviews, mothers with large kin networks were more likely to give birth at home. According to the majority of participants, pregnant women who were embedded in homogeneous networks, particularly those living with their in-laws, had very little influence on birth-related decisions. *"In my region, it is quite common for mothers not to go to health facilities because they have to go to the mother-in-law who organizes their circumcision"* - this description by one of the CHWs highlights the normative influence that women's network members can have on their facility delivery decision.

CONCLUSION

The results of the study indicated that women who were embedded in social networks with high endorsements for skilled birth attendants were more likely to deliver

in health facilities. Interviews with the CHWs also indicated that social networks have a normative influence on birth attendant decisions due to the social capital they provide in the form of information on provider quality of care and the usefulness of health facilities during delivery.

The study also demonstrated the significant influence of social networks kinship homogeneity on birth attendant decision. Mothers who were embedded in homogenous networks were less likely to utilize health facilities during birth with further statistical tests reporting that a mother embedded in a homogenous network experiences a reduction of 70% in the odds of having a facility delivery compared to a mother embedded in less homogenous social networks. Similar findings were also reported from the interviews which revealed that pregnant women who were embedded in homogeneous networks, particularly those living with their in-laws, had very little influence on birth-related decisions.

Overall, the findings of this study open the possibility of better understanding the role of social networks in birth attendant decisions, particularly in countries with similar contexts to Kenya. The findings show that social networks can either facilitate or constrain facility utilization during birth, and thus health education and mother mobilization health interventions promoting facility birth should capitalize on the role of social network members.

Conflict of Interest: None

REFERENCES

1. AbouZahr C. Safe motherhood: a brief history of the global movement 1947-2002. *Br Med Bull.* 2003;67:13–25.
2. Trends in maternal mortality 2000 to 2017: estimates by WHO, UNICEF, UNFPA, World Bank Group and the United Nations Population Division: executive summary [Internet]. [cited 2022 Sep 10]. Available from: <https://apps.who.int/iris/handle/10665/327596>

3. The DHS Program - Kenya: Standard DHS, 2021 [Internet]. [cited 2022 Sep 10]. Available from: <https://dhsprogram.com/methodology/survey/survey-display-566.cfm>
4. Kamal SMM. Factors Affecting Utilization of Skilled Maternity Care Services Among Married Adolescents in Bangladesh. *Asian Popul Stud.* 2009 Jul 1;5(2):153–70.
5. Edmonds JK, Hruschka D, Bernard HR, Sibley L. Women's social networks and birth attendant decisions: Application of the Network-Episode Model. *Soc Sci Med.* 2012 Feb;74(3):452–9.
6. Webster NJ, Antonucci TC, Ajrouch KJ, Abdulrahim S. Social Networks and Health Among Older Adults in Lebanon: The Mediating Role of Support and Trust. *J Gerontol B Psychol Sci Soc Sci.* 2015 Jan;70(1):155–66.
7. St Clair PA, Smeriglio VL, Alexander CS, Celentano DD. Social network structure and prenatal care utilization. *Med Care.* 1989 Aug;27(8):823–32.
8. Ono M, Matsuyama A, Karama M, Honda S. Association between social support and place of delivery: a cross-sectional study in Kericho, Western Kenya. *BMC Pregnancy Childbirth.* 2013 Nov 21;13(1):214.
9. Stata | FAQ: Citing Stata software, documentation, and FAQs [Internet]. [cited 2022 Sep 10]. Available from: <https://www.stata.com/support/faqs/resources/citing-software-documentation-faqs/>
10. Niederdeppe J, Hornik RC, Kelly BJ, Frosch DL, Romantan A, Stevens RS, et al. Examining the dimensions of cancer-related information seeking and scanning behavior. *Health Commun.* 2007;22(2):153–67.
11. Hornik R, Parvanta S, Mello S, Freres D, Kelly B, Schwartz JS. Effects of scanning (routine health information exposure) on cancer screening and prevention behaviors in the general population. *J Health Commun.* 2013;18(12):1422–35.
12. Zhang J, Centola D. Social Networks and Health: New Developments in Diffusion, Online and Offline. *Annu Rev Sociol.* 2019;45(1):91–109.
13. Kohler HP. Fertility and Social Interaction: An Economic Perspective [Internet]. Oxford University Press; 2001 [cited 2022 Sep 10]. Available from: <https://econpapers.repec.org/bookchap/oxpo/books/9780199244591.htm>
14. Kinship Networks and Contraceptive Choice In Nang Rong, Thailand [Internet]. Guttmacher Institute. 2005 [cited 2022 Sep 10]. Available from: <https://www.guttmacher.org/journals/ipsrh/2001/03/kinship-networks-and-contraceptive-choice-nang-rong-thailand>

How to cite this article: Mungai Mwangi, Mary Gitahi, George Evans Owino. Role of social network structures on birth attendant decisions among women in Nakuru County, Kenya. *Int J Health Sci Res.* 2022; 12(11):190-198. DOI: <https://doi.org/10.52403/ijhsr.20221124>
