Birth preparedness among women in Tharaka Nithi County, Kenya

By Eliphas Gitonga, Margaret Keraka and Peter Mwaniki

In 2008, there were an estimated 358,000 maternal deaths worldwide (World Health Organization (WHO), 2010). It is also estimated that in Kenya, 7700 women die annually owing to pregnancy-related complications. This translates into the deaths of approximately 21 women each day, or one woman every hour (United States Agency for International Development, 2008). The fifth Millennium Development Goal is to reduce maternal mortality by 75% between 1990 and 2015. The Kenya Demographic and Health Survey 2008–09 found that maternal mortality remains high in Kenya at 488 maternal deaths per 100,000 live births (Kenya National Bureau of Statistics and ICF Macro, 2010). This is far from achieving the fifth Millennium Development Goal target, to reduce maternal mortality to 147 maternal deaths per 100,000 live births by 2015 (Kenya National Bureau of Statistics and ICF Macro, 2010).

In Kenya, 92% of women receive skilled antenatal care from health professionals but only 43% give birth with skilled health personnel in attendance, which remains below the 2010 fifth Millennium Development Goal target of 67%, and far below the 2015 target of 90% (Kenya National Bureau of Statistics and ICF Macro, 2010). In addition, only 44% of women give birth at health facilities, and 56% of births occur at home (Kenya National Bureau of Statistics and ICF Macro, 2010). This situation is not better in the former Eastern Province (where Tharaka Nithi County is located), where there is 93.4% antenatal attendance by skilled health personnel but only 42.8% of women give birth in a health facility and only 43.1% with skilled health personnel in attendance. Women in rural areas are twice as likely to give birth at home compared with those in urban areas (Kenya National Bureau of Statistics and ICF Macro, 2010).

In Tharaka, a sub-county with an estimated 4732 births and over 80% skilled antenatal attendance, 61% of women give birth with no skilled assistance, mainly at home or on the way to a health facility (Ministry of Health, 2008). In 2005, the sub-county health management team expressed a need for information to reduce the lack of skilled attendance at birth. This study assesses the determinants of birth preparedness among women who had given birth in the last 2 years in Tharaka Nithi County, Kenya.

The preferred birth attendant

The desired place of birth

The location of the closest appropriate care facility

Funds for birth-related and emergency expenses

A decision-maker during the birth process

Support in looking after the home and children while the woman is away

Transport to a health facility for the birth

Transport in the case of an obstetric emergency

Identification of compatible blood donors for emergencies

Keywords: Antenatal care, Birth preparedness

Abstract

Background/Aim: In 2005, the sub-county health management team identified a need for information to reduce the lack of skilled attendance at birth. This study assesses the determinants of birth preparedness among women who had given birth in the last 2 years in Tharaka Nithi County, Kenya.

Methods: Stratified sampling was used to select 345 pregnant women for interview. Systematic sampling was used so that every 14th client attending a maternal/child health clinic in the sampled facilities was interviewed. A descriptive cross-sectional survey design was used. A chi-squared test and logistic regression were used to analyse the data.

Results: Approximately 20% of the interviewed sample were prepared for birth on all six recommended aspects of birth preparedness. The most planned for aspect of birth was hospital birth expenses (74%), followed by place of birth (69%). The least prepared for aspect was transport to a health facility (35%).

Conclusions: Higher level of education, higher income, salaried occupation and at least four antenatal care visits all increased the likelihood of being more prepared for birth. A history of stillbirth reduced the likelihood of birth preparedness. It is recommended that the Kenya Ministry of Health improve levels of birth preparedness through the provision of antenatal care.

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Methods

Study design and setting
A descriptive cross-sectional survey design was used. The target population was women who had given birth within 2 years before the study. The target sample was estimated to be 4732 (Kenya National Bureau of Statistics and ICF Macro, 2010).

The study was conducted in Tharaka sub-county in Tharaka Nithi County, in the former Eastern Province of Kenya. Most of Tharaka sub-county is rural. The sub-county covers an area of 1569.5 km² and has a total population of 130,098, of which 67,211 are women (Kenya National Bureau of Statistics and ICF Macro, 2010). The sub-county has one sub-county hospital, one mission hospital, one sub-sub-county hospital, two health centres and 20 dispensaries (Ministry of Health, 2008). The number of women of reproductive age (15–49 years) is 31,547, and the estimated number of pregnant women is 4732 (Kenya National Bureau of Statistics and ICF Macro, 2010). Less than half (39.2%) of the women in Tharaka sub-county give birth with skilled health personnel in attendance. The average distance to the nearest health facility is 7 km and the referral facility may be as far as 30 km away. Most of the sub-county does not have a good transport network (Ministry of Health, 2008).

Variables
The dependent variable was birth preparedness, and women were divided into two groups: prepared and unprepared. Women were considered to have prepared for birth if they had planned for all six of the following aspects of birth preparedness as described by WHO (2006):

- Desired place of birth
- A skilled birth attendant
- Transport to a health facility for the birth
- Funds for hospital birth expenses, including costs of skilled and emergency care
- A birth companion
- Support in looking after the home and children while the woman is away.

The independent variables were:

- Age
- Level of education
- Marital status
- Religion
- Residence
- Occupation
- Parity
- Antenatal care visit attendance
- Antenatal care visit attendance in the first trimester
- Neonatal complication(s) in previous pregnancies
- Awareness of birth preparedness
- Advice received on birth preparedness
- Travel time to health care facility
- Distance to health care facility
- Quality of antenatal care at health care facility.

Sampling, data collection and data analysis
Health facilities were identified using a stratified sampling strategy. This was done using the levels classified by the Kenya Essential Package for Health (Ministry of Medical Services and Ministry of Public Health and Sanitation, 2013) and the region of the facility. A sample size of 345 was determined using Kothari’s (2004) formula. Systematic sampling was used so that every 14th client attending a maternal/child health clinic in the sampled facilities was interviewed. The number 14 was arrived at using the calculation Kth=N/n, where N is the target population (4732) and n is the sample size (345). The first respondent was selected at random from the attendance numbers that mothers were given when they arrived at the clinic. Semi-structured questionnaires, focus group discussions and interview schedules were used to collect the data.

Data were entered into STATA version 11. Descriptive statistics and a $\chi^2$ test at a 95% confidence interval were used to test the association between the independent and dependent variables. Variables with a statistically significant association were subjected to logistic regression to generate the odds ratio. Results were interpreted as significant at $p < 0.05$.

Ethical considerations
Ethical approval was sought from the Kenyatta University Ethics and Research Committee, and a research permit to carry out the study was granted by the Ministry of Higher Education Science and Technology. Permission was sought from authorities, including the Tharaka sub-county health management team and the heads of the participating health facilities providing antenatal care.

Written informed consent to participate was obtained from all respondents. Participation was voluntary and the benefits and risks of participating in the study were explained to the participants before the study commenced.

Results
The dependent variable was birth preparedness. As shown in Figure 1, approximately 20% (n=70) of respondents indicated that they were prepared for birth. Where there was a significant association between variables, logistic regression was performed.
Demographic determinants of birth preparedness

Level of education

The proportion of women prepared for birth was highest among those with tertiary education (50%) and lowest among those with no formal education (100%) (Figure 2). This difference was statistically significant ($\chi^2 = 25.35$ (df = 5, 95% CI), $p = 0.001$). A rise in the level of education in women, e.g. from primary to secondary education, was 1.5 times more likely to increase birth preparedness. Participant interviews indicated that the woman’s educational level influenced her ability and the quality of her decisions on birth preparedness.

Marital status

Birth preparedness was higher among the married (22%) than the unmarried (11%) (Figure 3). There was a statistically significant association between marital status and birth preparedness ($\chi^2 = 4.015$ (df = 1, 95% CI), $p = 0.045$). In the focus group discussions, women cited a lack of spousal support, divorce and mismanagement of funds by spouses as barriers to birth preparedness. Married women were 2.3 times more likely to prepare for birth than unmarried women.

Occupation

A higher proportion of women in salaried employment (44%) was prepared for birth than those in non-salaried work (19%) (Table 1). There was a statistically significant association between type of occupation and birth preparedness. Women with a salaried occupation were 3.5 times more likely to prepare for birth than those in non-salaried work.

Income

The proportion of women prepared for birth increased as women’s average monthly income increased (Figure 4). There was a statistically significant association between average monthly income and birth preparedness ($\chi^2 = 13.63$ (df = 2, 95% CI), $p = 0.001$). Participant interviews and focus group discussions indicated that women of low economic status do not find it beneficial to make a birth plan as they will not be able to implement it due to financial constraints. The cost of giving birth in health facilities was also cited as a hindrance to planning to give birth in a health facility. Women earning more than Ksh 5000 were 1.6 times more likely to prepare for birth than those whose incomes were less than Ksh 5000.

Maternal determinants of birth preparedness

History of stillbirth

Fisher’s exact test was used to assess the association between a history of stillbirth and birth preparedness. There was a higher proportion of birth preparedness among women who did not have a history of stillbirth (22%) than those who had experienced a stillbirth (6%) (Table 2). There was a statistically significant association between history of stillbirth and birth preparedness. Having a history of stillbirth reduced the likelihood of birth preparedness by 0.2 times.

Antenatal care visit attendance

In the focused antenatal care approach, it is recommended that a woman should attend for at least four visits. A higher proportion of women were prepared for birth among those who attended four or more antenatal care visits (26%) compared to those who did not attend (15%) (Figure 5). There was a statistically significant association between women’s attendance at four or more antenatal care visits and birth preparedness ($\chi^2 = 8.19$ (df = 1, 95% CI), $p = 0.004$). Attendance at four or more antenatal care visits increased the likelihood of birth preparedness by 2.2 times.
Participants also indicated that a recent change that had been made to the antenatal care card affected the quality of birth preparedness advice by health professionals. A checklist of birth preparedness aspects that had previously been included in the antenatal care card had been replaced by an information booklet. This change increased the likelihood of oversights by staff because of the lack of a reference tool. Furthermore, there is currently no monitoring system for the implementation of birth preparedness.

**Discussion**

Studies in sub-Saharan Africa have found low rates of birth preparedness. High levels of birth preparedness have been shown to be strongly associated with increased levels of use of skilled birth attendants (Kabakyenga et al, 2011). The proportion of women who were prepared for birth in the present study was 20%. This is lower than the percentage of women who were birth prepared in Mbarara district in Uganda (35%) (Kabakyenga et al, 2011); however, the researchers only assessed four aspects of birth preparedness: had saved money; had bought birth materials; identified a health professional; identified means of transport. Agarwal et al (2010) also found a higher level of birth preparedness (48%) in their study in Indore city, India, in which the researchers assessed the following four aspects of birth preparedness: identified a trained birth attendant; identified a health facility; arranged for transport; had saved money for emergency care. Kushwah et al (2009) also found a higher rate of birth preparedness (48%) in the Rewa district of Madhya Pradesh, India. A similar level of birth preparedness (22%) was found in Adrigat, Ethiopia (Hiluf and Fantahun, 2007).

**Demographic determinants**

Using logistic regression analyses, the following variables were significant in predicting birth preparedness (Table 3):

- Maternal education (odds ratio = 1.5)
- Occupation (odds ratio = 3.5)
- Marital status (odds ratio = 2.3)
- Monthly average income (odds ratio = 1.6)

Married women had a higher likelihood of birth preparedness than unmarried women. This finding may be associated with spousal support in decision making. The social acceptability of pregnancy in a marriage setting also means that married women are more likely to have a birth plan. This finding is supported by a previous study conducted in Ethiopia (Hiluf and Fantahun, 2007).

A rise in the level of education increased the likelihood of preparing for birth. This may be due to the woman being more informed about the risks of childbirth and so being able to make better, more informed choices. This finding is supported by Mutiso et al (2008), who found that literacy positively influenced birth preparedness among women in Kenya. A Ugandan study by Kakaire et al (2011) also found that educational level was a determinant of birth preparedness.

An increase in average income increased the likelihood of preparing for birth. This relates to the ‘three delays model’ (Thaddeus and Maine, 1994), where the first delay in a decision to seek care was related to socioeconomic and cultural factors. In their study of Ugandan women, Kabakyenga et al (2011) indicated that ownership of assets was a predictor of birth preparedness.

There was a significant association a history of stillbirth (odds ratio = 0.2) and antenatal care attendance of four or more visits (odds ratio = 2.2) (Table 4). Both these variables also had significant prediction on the outcome of the birth preparedness. Attendance at four or more antenatal care visits positively influenced birth preparedness. A greater chance of health worker attention may improve education on birth preparedness and follow-up care. In addition, antenatal care is the entry point to birth preparedness. This finding is supported by a study from southern Ethiopia, which found that the availability and use of antenatal services positively influenced birth preparedness (Hailu et al, 2011).

**Figure 4. Association between average monthly income and birth preparedness (n=345)**

<table>
<thead>
<tr>
<th>Average monthly income (Ksh)</th>
<th>Unprepared</th>
<th>Prepared</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;1000</td>
<td>12</td>
<td>88</td>
</tr>
<tr>
<td>1000–5000</td>
<td>23</td>
<td>77</td>
</tr>
<tr>
<td>&gt;5000</td>
<td>35</td>
<td>65</td>
</tr>
</tbody>
</table>

**Figure 5. Association between birth preparedness and antenatal care visit attendance (n=345)**

<table>
<thead>
<tr>
<th>Attendance at four or more antenatal care visits</th>
<th>Unprepared</th>
<th>Prepared</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>15</td>
<td>85</td>
</tr>
<tr>
<td>No</td>
<td>26</td>
<td>74</td>
</tr>
</tbody>
</table>
Similarly, having a history of stillbirth had a negative influence on birth preparedness. Women with a history of stillbirth were less likely to prepare for birth. This finding may be associated with the circumstances that lead to stillbirth, such as living far away from a health facility, lack of transport to a health facility, a low level of education and low socioeconomic status. However, this finding does not support the observations from a similar study in Ethiopia, which found that history of stillbirth had a positive influence on birth preparedness (Hiluf and Fantahun, 2007), perhaps as a result of a desire to avoid another stillbirth.

Recommendations

- This study found a low level of birth preparedness among participants. It is therefore recommended that the Kenyan Ministry of Health increases the awareness of birth preparedness among women of reproductive age (15–49 years) through the provision of antenatal care.
- This study found that low income is associated with a lack of birth preparedness. It is therefore recommended that all relevant national government departments develop strategies to increase women's earnings.
- This study found that attendance at four or more antenatal care visits increases the level of birth preparedness. It is therefore recommended that the Ministry of Health provides increased funding that will enable health facilities to provide women with a minimum of four antenatal care visits per pregnancy.

Conclusions

Research has shown that birth preparedness reduces maternal mortality. Many strategies, such as the implementation of a birth preparedness initiative, have been devised to reduce maternal mortality in Kenya. The main objective of this study was to assess the determinants of birth preparedness among women in Tharaka sub-county in Kenya. Birth preparedness among women in this region is low (20%). The most planned for aspect of birth was hospital birth expenses (74%), followed by place of delivery (69%). The least prepared for aspect was transport to a health facility (35%).

Conflict of interest: None declared.


Ministry of Health, Republic of Kenya

Key Points

- Preparedness for birth on all of the recommended six aspects of birth preparedness was low (20%) among women who had given birth in the previous 2 years in Tharaka sub-county.
- A higher level of education, salaried occupation, and higher income increased the likelihood of birth preparedness.
- Attendance at four or more antenatal care visits had a positive association with birth preparedness.
- A history of stillbirth was associated with a reduced likelihood of preparing for birth.

| Table 2. Association between a history of stillbirth and birth preparedness |
|-----------------------------|-----------------------------|-----------------------------|
|                                | Unprepared | Prepared | Fisher's exact test |
| No history of stillbirth      | 244 (78)   | 68 (22)  | Odds ratio: 0.038 (95% CI) |
| History of stillbirth         | 31 (94%)   | 2 (6)    |                          |

| Table 3. Logistic regression analysis of sociodemographic determinants |
|-----------------------------|-----------------------------|-----------------------------|
| Variable                   | Fisher's exact test         | p                           |
| Level of education          | 1.464 (95% CI 1.176–1.823)  | >0.001                      |
| Marital status              | 2.301 (95% CI 0.999–5.299)  | >0.050                      |
| Occupation                  | 3.419 (95% CI 1.296–9.019)  | >0.013                      |
| Average monthly income      | 1.603 (95% CI 1.377–2.943)  | >0.034                      |

| Table 4. Logistic regression analysis of maternal factors |
|-----------------------------|-----------------------------|-----------------------------|
| Variable                   | Fisher's exact test         | p                           |
| Stillbirth in a previous delivery | Odds ratio: 0.226 (95% CI 0.0540–0.991) | 0.047               |
| Attendance at four or more antenatal care visits | Odds ratio: 2.233 (95% CI 1.275–3.8447) | 0.005               |