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E.M. Mulogo, MPH, MHSM, Lecturer, Mbarara University of Science and Technology, P.O Box 1410, Mbarara, Uganda, K. Witte, PhD, Adjunct Professor, Michigan State University, Department of Communication, East Lansing, MI 48824, F. Bajunirwe, MSc (Epidemiology), Lecturer, S.K. Nabukera, MPH, Senior Lecturer, C. Muchunguzi, MA (Development Studies), Lecturer, V.K. Batwala, MPH, Lecturer, F. Bagenda, MSc, Lecturer, Mbarara University of Science and Technology, P.O Box 1410, Mbarara, Uganda, C. Farr, PhD., Assistant Professor, Department of Communication, North Carolina State University, Raleigh, NC 27695-8104 USA and S. Barry, MD, International Public Health Consultant, Delivery of Improved Services for Health II Project, Kampala, Uganda

Request for reprints to: Dr. E.M. Mulogo, Mbarara University of Science and Technology, P.O Box 1410, Mbarara, Uganda

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E.M. MULOGO, K. WITTE, F. BAJUNIRWE, S.K. NABUKERA, C. MUCHUNGUZI, V.K. BATWALA, F. BAGENDA, C. FARR and S. BARRY

ABSTRACT

Objectives: **To evaluate whether the completion of birth plans is associated with delivery in a health facility and the perceptual causes of birth plan completion and health facility based delivery were explored according to a well-tested health behaviour theory.**
Design: **A community survey.**
Setting: **Rakai and Luwero districts.**
Subjects: **A total of 415 (202 in Rakai and 213 in Luwero district) respondents were randomly selected and interviewed using a mixed survey questionnaire composed of open and close-ended questions.**
Main outcome measures: **Health facility based delivery.**
Results: **The results demonstrate a statistically significant relationship between the completion of birth plans and delivery in a health facility (OR =1.86, 95% CI =1.1, 3.1). The fear of consequences of delivering at home was found to be an important driving force in promoting the completion of birth plans, thereby indirectly influencing the likelihood of delivery in a health facility.**
Conclusion: **Given the empirical evidence presented here, this study suggests that birth plans are an important tool in improving the rate of health facility based deliveries and thus essential in the fight against maternal mortality in Uganda. It is further recommended that campaigns market the use of birth plans as a way to reduce uncertainty and manage fear and the unknown about pregnancy.**

INTRODUCTION

One of the most discouraging health indicators in Uganda is that of maternal mortality (1). The maternal mortality ratio for Uganda in the year 2000 was estimated at 880 maternal deaths per 100,000 live births (2). This value is among the highest in the sub–Saharan region. In comparison, the maternal mortality ratio averages 24 in the United States and 11 in the United Kingdom per 100,000 (3). It has been estimated that 61,000 Ugandan women will die of childbirth-related causes between the years 2000 and 2010 if no further action is taken (1). Furthermore, for every woman who dies as a result of maternal complications, between 20 and 30 more will suffer short and long-term disabilities. This means that between the years 2000 and 2010, 100,000 women will become infertile and about 1,200,000 will suffer from disabilities such as inability to breastfeed, incontinence due to fistulae and chronic pelvic pain because of complications associated with child birth (1).

In light of the grave maternal and newborn situation in the country, the government has

incorporated a safe motherhood initiative into the national health policy (1). The main objective of this initiative is to reduce maternal morbidity and mortality through ensuring that prenatal care, essential obstetric care, newborn care, and postnatal care are available and widely accessible to Ugandan mothers (4).

A likely contributory factor to the high maternal mortality in Uganda is the reported low rate of births attended to by health workers with midwifery skills in Uganda. Only four in ten births in Uganda are attended to by a trained health worker, while 18% are attended to by a traditional birth attendant and a relative or friend assists 28% (5). Fifteen percent of births are unattended. Most births take place at home; only 37% of births occur in a health facility despite the fact that in Uganda women receive at least some antenatal care (health facility based) for more than nine in ten births. A nurse or midwife in most cases (83%) provides the antenatal care while for 9% of the pregnant women it is provided by a doctor (5). Antenatal care has been reported to be a potentially effective instrument to ensure better use of obstetric services (6).

Having a skilled health professional at delivery is essential for making motherhood safer. A skilled birth attendant can ensure hygiene during labour and delivery, provide safe and non-traumatic care, recognise complications and manage them effectively, and/or refer the woman to a higher level of care (4). The term 'skilled attendant' refers exclusively to people with midwifery skills (for example midwives, doctors and nurses) who have been trained to proficiency in the skills necessary to manage normal deliveries and diagnose, manage or refer obstetric complications (7). In many parts of the world, women turn to TBAs because other health workers are not available or are too expensive, or because TBAs understand the culture and respect women needs (8). However skilled attendance does not include care at birth provided by: traditional birth attendants, volunteer workers/supporters, family members, friends and women themselves or care providers without midwifery skills (9). About half of the women in Uganda live within five kilometres of a health facility providing antenatal care, delivery care, and immunisation services (10).

A low rate of health facility based deliveries combined with factors such as the "three delays" - delay by the mother in deciding to seek appropriate care, delay in reaching a treatment facility, and delay in receiving adequate treatment at the facility once she arrives - contribute to a high maternal mortality rate. Increasing the number of births attended to by trained health workers is a key intervention that is hypothesised to alleviate many of the maternal health problems described previously because skilled attendants will be present to manage pregnancy related complications (1). However not all skilled attendants can provide comprehensive emergency obstetric care although they should have the skills to diagnose when such interventions are required and the capacity to refer women to a high level of care when needed (11).

"Birth Plans" are viewed as a strategy for increasing the rate of health facility based deliveries, although no formal test of this hypothesis exists in Africa. A "birth plan" is developed between a service provider and client where decisions are made and documented on such issues as planned place of delivery, form of transport to be used, check list of items required by client during delivery, and choice of alternative care giver in the absence of the spouse (12). The dialogue engendered through creation of a birth plan aims at encouraging the client and spouse to seek assistance of a skilled attendant at a health facility during birth. In Uganda the development of "birth plans is initiated during the first antenatal visit, between the health worker and pregnant woman.

Theoretical Background

This study was grounded in the "Managing Fear Approach," based on the Extended Parallel Process Model (13-15), which is grounded in Protection Motivation Theory (16-17). Social Learning Theory (18), and the Health Belief Model (19).

This theory suggests that fear motivates action – any kind of action. The kind of action taken depends on one's perceived self–efficacy (i.e., "Do I feel able and confident to do the recommended response?") and response efficacy (i.e., "Do I think the recommended response works in averting the threat?") toward the recommended response. Depending on various combinations of fear and perceived efficacy, one is motivated to either control the danger and take protective action or control one's fear and engage in defensive avoidance and other psychological defense mechanisms.

Briefly, if one feels frightened of a health threat, in this case death or complications from not delivering in a health facility, then one is motivated to act. If one has high self-efficacy (i.e., the confidence that one knows what to do and where to go to deliver) and high response efficacy (i.e., one believes that a health facility based delivery prevents death and delivery complications), then one is motivated to control the danger and adopt the recommended response, in this case, delivering in a health facility. If, on the other hand, one feels frightened of a health threat and motivated to act, but doubts whether or not one is able to deliver in a health facility (low self-efficacy) and / or doubts whether or not a health facility based delivery prevents problems (low response efficacy), then one turns instead to controlling the fear (i.e., "I'm just not going to think about it. It'll be ok").

A number of studies across diverse populations and topics have supported the theory's premise that fear motivates action, and that high response / self-efficacy combined with high fear promotes danger control actions where the recommended response is adopted (to control the danger or threat), and that low response / self-efficacy combined with high fear promotes fear control actions where the fear is controlled through defensive avoidance and the recommended response is ignored (20-22).

In the present study, the completion of the birth plan is the means to the recommended response – delivery in a health facility. Therefore, each of the theory's variables was measured and tested to assess their association with both the completion of birth plan as well as delivery in a health facility. Please note that the birth plans were not designed to induce any sort of fear. However, because of the high maternal mortality levels in Uganda, our measurement framework needed to assess levels of fear around childbirth and then determine how these fears might be managed through adoption of our intervention (the birth plan).

The aim of the study was to establish whether the completion of a birth plan is associated with delivery in a health facility. In addition, the perceptual causes of birth plan completion and health facility based delivery was explored according to a well-tested health behaviour theory.

MATERIALS AND METHODS

Design and sample population: A community survey employing predominantly quantitative methods was conducted in two sites in Uganda in April 2002. The two sites were purposely chosen to represent "average" sites in "average" districts according to objective performance accomplishment scores (measuring degree to which reproductive health-related practices and objectives are met at health facilities within the sites). The two sites were Semuto in Luwero district and Lwamaggwa in Rakai district which are located in central and south central Uganda respectively. As is in most of the country, the population in the two districts is predominantly rural. The rate of health facility based deliveries in the selected districts is similar to that in the other average districts in Uganda. The two sites were implementing a Delivery of Improved Services for Health (DISH) II Project. The project implemented an innovative strategy that promoted birth preparedness (birth planning), goal–oriented antenatal care, malaria prevention and control during pregnancy and deliveries in health facilities as part of a safe motherhood initiative. The implementation of this safe motherhood initiative was more intensive in Semuto as compared to Lwamaggwa. This paper compares birth plan completion and health facility based deliveries in these two sites that differ in intensity of the interventions.

A random household sample was drawn from the service area surrounding the major health facility (health centre) in each of the study sites. A service area was defined as all parishes, villages, and dwellings within a five kilometre radius of the health centre. To determine the appropriate sample size per site, conventional standards of 0.80 power, $\alpha = 0.05$. and an expected minimum difference of 10% between the two sites on key variables of interest were set. Power estimates were based on extracted effect sizes from previous studies from the Managing Fear Approach (23). The following formula was used:

$$N = \frac{\left[Z_{1-\alpha} \sqrt{2^* P(1-P)} + Z_{1-\beta} \sqrt{P_1(1-P_1) + P_2(1-P_2)} \right]^2}{(P_2 - P_1)^2}$$

Where, P $((P_1 + P_2)/2)$ was 20, P_1 was the estimated level birth plan completion = 15%, P_2 was the expected increase of 10% resulting in an estimate of 25%, $Z_{1-\alpha}$ (where α = Type 1 error) was 1.645, and $Z_{1-\beta}$ (where β = statistical power to detect an increase – or a one-sided change) was 0.84. Therefore, a minimum of 197 respondents were required per study site.

Fresh listings of all dwellings were prepared and every n^{th} house was visited with a random start, where n represents the quotient of the total number of houses in the catchment area and the number of households required. Survey respondents were 18 years and older. Given that males in Uganda have a profound influence on health care decisions within the household, both male and female respondents were interviewed. When multiple respondents were available within a household, an inventory of all eligible respondents was taken and then one respondent was chosen by random draw. Only one person per household was interviewed. A total of 415 respondents were interviewed in Semuto and Lwamaggwa. Of these, 202 (49 %) were interviewed in Semuto while 213 (51%) respondents were interviewed in Lwamaggwa.

Instrument: A mixed survey questionnaire with open and close-ended questions was designed. This was translated into the local language of Luganda (common language in both study sites). It was then back translated into English to ensure commonality and denotative equivalency. The instrument was pilot tested, and adjustments were made before the final questionnaire was completed. The questionnaire was interviewer administered.

Analysis: In order to measure the theoretical latent constructs of fear, perceived self-efficacy, perceived response efficacy, etc., a series of questions on Likert-type scales were asked. The responses to the items on these scales ranged from 'Strongly Disagree' with a score of one to 'Strongly Agree' with a score of five. The neutral position was assigned a score of 3. Composite scales were created using the average of these items to represent the different domains. Reliability was assessed with Cronbach's alpha.

A number of variables are postulated to influence a woman's decision to complete a birth plan or deliver in a health facility. These include demographic socio-economic, personal, socio-cultural, pregnancy and health service related factors as well as presence of alternative care providers.

However the study mainly focuses on exploring the role of personal factors given that these are of particular relevance to the "Managing Fear Approach". These personal factors were measured within latent constructs because it is anticipated that reasons for individuals to make a decision to deliver at a health facility are not easily obtained by a single item question. Rather the reasons are embedded in a battery of items all targeted towards the underlying latent variable. A single item would unlikely capture the whole domain of "perceived self-efficacy," for example. Factor analysis using principle component analysis was used to explore pooled items.

The analysis was done using the Statistical Package for Social Sciences (SPSS) program version 10. T-tests were used to compare the continuous variables, and 2-sided chi-square for association was done for the categorical variables. Probability values (p-values) were calculated at the 0.05 level of significance. In order to explore the degree to which each of the theoretical latent variables would predict the completion or non-completion of birth plans and delivery in a health facility, logistic regression analyses were performed. Multivariate techniques were used where applicable to control for confounding variables.

RESULTS

The results are presented under the sub-themes of descriptives on birth plans, differences between sites, correlations with other variables and logistic regression results.

Descriptives on birth plans: Respondents were approximately half female (228 or 55.6%) and half male (182 or 44.4%). Table 1 represents the socio-demographic profile of the respondents stratified by study site where they were interviewed. Following is a brief discussion of significant differences between sites.

One hundred and six (53%) of the respondents in Semuto were female compared to one hundred and twenty two (58%) in Lwamaggwa. A higher proportion of respondents in Lwamaggwa (27%) had not had any formal schooling compared to those in Semuto (7%). Most of the respondents were involved

Table 1

Socio-demographic profile of respondents stratified by sub-county

Characteristic	Lwamaggwa (n = 213)		Semuto (n = 202)		P-value
	No.	(%)	No.	(%)	
Respondent's gender (female)	122	(58)	106	(53)	0.35+
Religion					
Protestant	98	(46)	76	(38)	
Catholic	79	(37)	91	(45)	
Muslim	23	(10)	15	(7)	
Others	13	(6)	20	(10)	0.037+*
Age of respondent (mean, st.dev)	31	(10.4)	31.6	(9.6)	0.5‡
Educational level					
No formal schooling	57	(27)	14	(7)	
Primary	127	(60)	130	(65)	
Secondary and post secondary	29	(13)	58	(28)	0.000**
Employed in economic activity	170	(81.3)	164	(81.2)	0.97+
Married (at time of the survey)	185	(86.8)	146	(72.3)	0.000+**

‡ = t-test for equality of means
+ = Chi Square test
** = Significant at the 0.01 level
st.dev = standard deviation
* = Significant at the 0.05 level

in some form of employment with at least 80% of respondents in each study site affirmatively reporting involvement in some form of employment. One hundred and forty six (72%) of respondents in Semuto compared to 185 (87%) in Lwamaggwa were married at the time the survey was conducted. One hundred and thirty nine (41.5%) of the respondents had completed birth plans, while 165 (46.2%) reported having delivered their last baby in a health facility.

Association between completion of birth plans and health facility based deliveries: The respondents were asked whether they had ever completed a birth plan and also where their last delivery had taken place. In the analysis, the relationship between these two variables was explored. Overall, almost 50% of mothers who delivered their last child in a health facility had completed a birth plan. Only 42 (34.7%) of the respondents who had not delivered their last child in a health facility had completed a birth plan. Respondents who had completed a birth plan were more likely to deliver in a health facility compared to those who had not completed a birth plan. This relationship was statistically significant (OR= 1 .86 95% CI = 1.1, 3.1).

A stratified analysis by site was performed to explore the relationship between birth plan completion and health facility delivery. In Semuto, respondents who completed a birth plan were two times more likely to have delivered in a health facility (OR 2, 95% CI = 0.66, 6). The association was however not statistically significant. In the comparatively poorer service area of Lwamaggwa, the respondents who had completed a birth plan were three times more likely to have delivered their last child in a health facility (OR = 3, 95% CI = 1.5, 5.5). This association was statistically significant. The respondents who had attained some level of schooling were more likely to have completed birth plans than those without any schooling (OR = 3.4, 95% CI = 1 .6, 8.3). The respondents who were married at the time of the survey were more likely to have completed birth plans than those who were not married (OR = 3.1, 95% CI = 1 .6, 6.3). However there

was no statistically significant association between marital status and delivery at a health facility.

Differences between the sites: Factor extraction was done to identify the underlying latent constructs as shown in Table 2.

A comparison of mean scores from the theoretical latent variables for the two sites is highlighted in Table 3.

For the fear of the consequences of delivering at home, the respondents in both study areas agreed on average that delivering at home leads to serious health problems for the mother and baby. This fear was however more marked in Semuto compared to Lwamaggwa and the difference was statistically significant. Regarding the apprehension about use of health facilities scale, the respondents in Semuto seemed to have less apprehension about use of health facilities when they or their partners were pregnant. This difference was statistically significant.

On the scale for self-efficacy of using health facilities for reproductive health services, the respondents in Semuto find it easier than the ones in Lwamaggwa to visit the health facilities for reproductive health services. This difference was statistically significant.

On the scale for response efficacy of using health facilities for reproductive health services, the respondents in Semuto are more likely to acknowledge health benefits for both the mother and baby if delivery is at a health facility than the respondents in Lwamaggwa. There was however no statistically significant difference in the response efficacy of using health facilities for reproductive health services and attitudes for health services.

On the defensive avoidance for motherhood and delivery issues, the respondents in both sub-counties appear to have low avoidance on the issues of motherhood and delivery and the associated complications. The residents in Semuto were more likely to avoid involvement in delivery issues compared to those in Lwamaggwa but the difference was not significant.

Of the respondents who had completed birth plans, 61 (30%) were in Semuto and 78 (37%) in Lwamaggwa. However this difference was not statistically significant (p-value = 0.17).

One hundred and nine (63%) respondents in Semuto had delivered a baby in a health facility compared to only 56 (30.6%) respondents in Lwamaggwa. This difference was statistically significant (Chi-Square p-value <0.001, X^2=37.9 one degree of freedom).

Table 2

Safe motherhood initiative measures and reliabilities

Safe motherhood construct	Example item 1 Strongly Agree	2	3	4	5 Strongly Disagree	Number of items creating scale	Cronbach's Alpha
Fear of Home Delivery	The possibility of mother or baby getting problems if delivery is at home.					2	0.83
Apprehension towards use of health facility	I/my partner afraid to visit a health facility when pregnant.					2	0.78
Self efficacy	I/my partner find it easy and reliable/feasible to visit a health facility for delivery service.					4	0.83
Response efficacy	Delivery at health facility results in a healthier baby and mother.					3	0.84
Attitudes	Getting check up and delivery at a health facility are good.					2	0.73
Defensive avoidance	I prefer not to think about complications relating to pregnancy and delivery.					4	0.80

Table 3

Mean scores on the composite scales compared in each sub-county

Composite scale	Lwamaggwa (n = 213)	Semuto (n = 202)	P-value+
Fear of consequences of delivering at home	4.17	4.39	0.02*
Fear of health facilities	1.96	1.66	0.001**
Perceived self efficacy	4.12	4.30	0.014*
Perceived response efficacy	4.54	4.62	0.15
Attitudes for health facilities	4.54	4.60	0.3
Defensive avoidance for motherhood and delivery issues	1.82	2.05	0.07

+ P-value calculation based on t-test for equality of means
The maximum score expected on each scale is five and minimum score one
** = Significant at the 0.01 level * = Significant at the 0.05 level

Table 4

Univariate logistic regression analyses to assess the relationship between latent constructs and completion of birth plans

Predictor	Odds Ratio (OR) (n = 415)	95% CI
Fear of consequences of delivering at home	1.4	1.11, 1.65**
Apprehension about use of a health facility	1.5	1.36, 1.59**
Self efficacy to use of health facility	1.0	0.64, 1.26
Response efficacy of using health facility	1.0	0.56, 1.43
Attitudes for health facilities	1.3	0.85, 1.70
Defensive avoidance of motherhood and delivery	1.5	1.32, 1.63**

** = Significant at the 0.01 level
* = Significant at the 0.05 level

Association between theoretical variables and completion of birth plans / health facility based deliveries: In order to explore the degree to which each of the theoretical variables predicted completion of birth plans, a univariate logistic regression was performed. Table 4 represents the relationship between the theoretical variables as predictors of completion of birth plans.

The greater the fear of delivering at home, the more likely respondents were to have completed a birth plan. Similarly, apprehension regarding health facilities and negative thoughts about pregnancy was associated with completing a birth plan. Univariate logistic regression was also performed to explore how the latent variables would predict delivery in a health facility. Table 5 represents the relationship between the latent variables as predictors of health facility based delivery.

Respondents who feared the consequences of not delivering in a health facility were more likely to have delivered their last child in a health facility. However this relationship was not found to be statistically significant. The less one's fear of health facilities, the more likely they were to have delivered their last child in a health facility compared to those who had greater fear. A one-unit increase in fear of health facility results in a 33% reduction in the

Table 5

Univariate logistic regression analysis to assess relationship between latent constructs and delivery at DISH II health unit

Predictor	Odds Ratio (OR) (n = 415)	95% CI
Fear of consequences of not delivering at health facility	1.05	0.83, 1.33
Fear of health facilities	0.77	0.61, 0.97*
Perceived self efficacy of using health facility services for RH	2.1	1.5, 2.95**
Response efficacy of using health facility services for RH	2.02	1.32, 3.12**
Attitudes towards health facilities	1.4	0.95, 2.05
Defensive avoidance for motherhood and delivery issues	1.2	0.89, 1.6

** = Significant at the 0.01 level
* = Significant at the 0.05 level

Table 6

Multivariate logistic regression adjusting for age, education and gender

Variable	Standard Error	P-value	OR (n= 415)	95% CI
District	0.243	0.000	3.544	2.20–5.71
Age	0.012	0.533	1.007	0.98–1.03
Educational level	0.203	0.452	1.165	0.78–1.73
Gender	0.243	0.012	1.846	1.15–2.97

likelihood of delivery in the health facility (OR = 0.77, 95% CI = 0.61, 0.97). Respondents who scored high on the perceived self efficacy and response efficacy of using health facility services for reproductive health are more likely to have delivered their last child in a health facility compared to those with low scores on the efficacy scales.

There were no differences in gender with regard to; fear of negative consequences of having more children, perceived severity of those negative consequences, fear of consequences of delivering at home and defensive avoidance for motherhood and delivery. However there was a significant difference for attitudes for health facilities (p = 0.02, t-test). For this reason we adjusted for gender in the multivariate analysis.

Finally, residents in Semuto were four times more likely to deliver in a health facility within their locality compared to those in Lwamaggwa (OR = 3.8, 95% CI = 2.4,6.1). In order to control for confounding variables due to differences in the distance of the health from the households, we performed a multivariate logistic regression with distance as a covariate. There was a slight change in the odds ratio (OR = 3.99, 95% CI = 2.4, 6.3) signifying that the difference in the distance from the health facility in the two sites poses minimal confounding effect. In order to control for confounding due to age, gender and education level a multivariate logistic regression was done. There was a slight change in the likelihood in delivery in a health facility (adjusted OR = 3.5, 95% CI = 2.2 - 5.7).

DISCUSSION

According to this study's findings, the completion of birth plans is likely to result in an increase in women delivering in health facilities. It is demonstrated that women who completed birth plans were actually more likely to have delivered their last child at a health facility. Therefore, campaigns to promote completion of birth plans should be useful in promoting deliveries in health facilities.

The women who were married at the time of the survey were more likely to complete birth plans. Married couples are expected to enjoy spousal support which would suggest that married women are more likely to deliver at a health facility. However this was not demonstrated by the study findings. The findings showed that marital status was not a predictor for health facility delivery. This suggests that married couples can be encouraged to deliver at a health facility through completion of a birth plan.

Those women who feared the consequences of delivering their babies at home were more likely to complete birth plans. Similarly, those women who felt apprehensive about delivering at a health facility were more likely to complete a birth plan. The completion of the birth plan may have been a way to manage their fear about delivering at a health facility. Perceptions of efficacy, i.e., beliefs about one's ability to deliver at a health facility and whether or not delivering at a health facility would lead to positive outcomes, were not predictive of completing birth plans. Finally, women who preferred to avoid negative thoughts about pregnancy and delivery were more likely to complete a birth plan. Again, the completion of the birth plan may have been a way to manage one's fears and negative thoughts about pregnancy.

In terms of actual deliveries, women with high perceived efficacy i.e., those who found it easy to use health facilities and those who associated such facilities with a positive delivery outcome, were more likely to deliver in a health facility. In addition, women who delivered in health facilities held less fear toward such facilities as compared to those who did not deliver in health facilities.

Collectively, these findings suggest that fear was a driving force either promoting or preventing behaviour. Fear about negative consequences of delivering at home appeared to motivate the completion of birth plans and therefore the likelihood of a health facility based delivery. However, strangely enough, fear about delivering at facilities also predicted completion of birth plans. It is possible that birth plans helped respondents manage their fear before the delivery. At the time of delivery, however, fear about health facilities inhibited deliveries there.

In all, campaigns may market the use of birth plans as a way to reduce uncertainty and manage fear and the unknown about pregnancy.

Limitations: The major limitation of this study was that the findings are limited to only two districts of the country. However given that the districts selected were "average" districts in terms of the extent to which reproductive health-related practices and objectives are met, these findings are likely to be similar across Uganda.

In conclusion, in view of the fact that the proportion of pregnant women delivering in health facilities in Uganda as well as several other developing countries remains low, interventions that seek to improve this deficiency need to be strongly advocated for and given prominence during the design and implementation of reproductive health care programmes. Given the empirical evidence presented here, this study suggests that birth plans are an important tool in improving the rate of health facility based deliveries and thus essential in the fight against maternal mortality. The completion of birth plans is also expected to reduce perinatal morbidity and mortality. However this needs to be evaluated by future research projects. Furthermore, this study suggests that the fear associated with giving birth at home can be capitalised on in awareness campaigns and used to motivate women to deliver in health facilities. Reproductive health programmes should therefore promote the use of birth plans although care should be taken to diminish the fear among some women, of delivering in health facilities.

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