Who decides? Joint decision making leads to better obstetric choices

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Synopsis: In rural Malawi, gaps in obstetric care remain, and joint and partner decision making led to better obstetric choices than decision making by women alone.

Type of article: Clinical Article

Introduction:

Sub-Saharan Africa has the highest maternal mortality ratio of any region in the world (World Health Organization & UNICEF, 2014). Maternal mortality arises from both inadequate maternal health services and inadequate uptake of existing services (Wilunda et al., 2015). Many women receive fewer than the recommended number of antenatal care visits or deliver without skilled assistance; appropriate obstetric care is less often obtained by unmarried women, those with lower household income, less education, or less educated partners, and those who have more children and have not had complications with previous pregnancies (Gabrysch & Campbell, 2009; Simkhada, Teijlingen, Porter, & Simkhada, 2008).

Decision-making autonomy is another important determinant of the uptake of maternal health services. Women in developing countries are often precluded from household decision making, and this exclusion may also extend to reproductive health (Blanc, 2001). Power imbalances within relationships can interfere with women's ability to access reproductive health services (Blanc, 2001; Upadhyay, Dworkin, Weitz, & Foster, 2014). Women, especially poor, uneducated women, are more likely to be in unequal relationships and have limited autonomy in accessing obstetric care (Beegle, Frankenberg, & Thomas, 2001; Blanc, 2001). In contexts of limited female autonomy and poor maternal health, facilitating joint decision making for obstetric choices may improve obstetric outcomes. Involving male partners in maternal health education has been found to improve obstetric outcomes in India and Nepal (Bhalerao, Galwankar, Kowli, Kumar, & Chaturvedi, 1984; Mullany, Becker, & Hindin, 2007).

In this paper, we analyze data collected as part of the baseline survey of a cohort study of sexual and reproductive health in rural Lilongwe District, Malawi. Questions of maternal health and access to health services are especially relevant in Malawi, where more than a quarter (29%) of women still deliver without skilled assistance (National Statistical Office & ICF Macro, 2010). In this paper, we provide an overview of reported obstetric care, examining location of delivery, assistance at delivery, delivery complications, and birthweight. We then examine the relationships between who made obstetric decisions (woman, partner, joint) about the woman's most recent delivery and two outcomes of interest (delivery location and complications) to assess whether facilitating joint decision making could be a useful reproductive health intervention in the region.

Materials and methods:

We analyzed data from a baseline questionnaire administered as part of the *Umoyo wa Thanzi* (UTHA; "Health for Life") research project. UTHA is a cohort study of sexual and reproductive health decision making in Lilongwe District, Malawi. Villages in the catchment area of a rural health facility—an area approximately 40km^2 in size and including 68 villages and 20,000 inhabitants—were selected via two-stage, stratified, cluster sampling, allowing for enrollment of approximately 1,000 women of reproductive age. In selected villages, all women aged 15 to 39 years as well as their partners were eligible for participation. From July 2014 to February 2015, 1034 women and 441 men completed the baseline questionnaire. Given the outcomes of interest, the presented analyses included only female participants.

In each selected village, trained research assistants conducted face-to-face interviews in Chichewa with all consenting participants. Data were recorded on tablet computers using the Magpi electronic data capture system (Magpi, Washington, DC) and uploaded daily to an internet-based storage system.

Our primary exposure was decision making in the context of obstetric care: we asked each woman who made the decision regarding where to deliver her most-recent child. Participants were given the following options: self (coded 'independent'), partner (coded 'partner'), self and partner together ('coded 'joint'), or someone else. The exposure was coded as an ordinal categorical variable and 'independent' was the referent category.

Outcomes included measures related to the most recent delivery. Specifically, we assessed location of delivery (home, TBA's home, on the road, at a clinic/hospital/health facility), assistance at delivery (nobody, relative, TBA, doctor/nurse), complications (none, excessive bleeding, infection, prolonged labor, obstructed labor, high blood pressure, convulsions, obstetric fistula), and birthweight (very large [larger than 4000 g], large [2500 to 4000 g], small [less than 2500 g], very small [less than 1500 g]). For multivariable analyses, we dichotomized location of delivery and complications. Location of delivery was coded as 'health facility' (included delivery at a clinic, hospital, health facility) and 'outside health facility' (included home, TBA's home, and on the road). We aggregated all complications into a single outcome category and compared this group of women to women without complications.

Our analysis population was restricted to female participants who had been pregnant at least once (860 women). We first used descriptive statistics to characterize the demographics, delivery practices, and obstetric outcomes of women in the study. We accounted for village-level clustering and ran separate unadjusted logistic regression models of the associations between joint decision making and the two outcomes of interest (delivery location and complications). We then adjusted for relevant socioeconomic and demographic factors. Based on prior literature, we decided *a priori* to retain age, education, and marital status in all models (Gabrysch & Campbell, 2009). Number of living children, whether the woman's partner was also a study participant, and household wealth were evaluated as confounders and retained if their removal resulted in a change in any association of interest of more than 10%. We assessed goodness of fit using Hosmer-Lemeshow (HL) tests. All analyses were conducted using Stata 12.0 (Statcorp, College Station, TX).

The study was approved by the Ohio State University Institutional Review Board and the University of Malawi College of Medicine Research and Ethics Committee before implementation. All participants provided written informed consent.

Results:

Most women in the parent cohort study had been pregnant at least once and were included in the analysis population (860 women). The median age of women was 27 years, with an interquartile range (IQR) of 22 to 32 years. Approximately half of women (49%) had completed 4-8 years of education, and nearly a third (29%) had completed just 1-3 years of education. More women reported a monthly income less than MK5,000 (~$13 USD at the time of data collection) than a monthly income above MK20,000 (~$52 USD) (35% vs. 25%). Most women (92%) were married. The median number of living children was 3 (IQR: 2-4) (**Table 1**).

When asked to think about their most recent pregnancy, 75% of women specified that they had delivered at a health facility; 10% reported home deliveries, and 9% reported deliveries at a TBA's home (**Table 2**). The most commonly cited reasons for delivering outside a health facility were lack of transportation (8%), that labor occurred late at night (7%), and that the health facility was too far away (6%). A majority of women (69%) reported having skilled assistance from a doctor or nurse at delivery, and a minority (13%) reported assistance from a TBA. Although none of the women reporting home births had skilled assistance at delivery, some women (9%) reporting facility births did not have skilled assistance at delivery.

Most women (78%) reported uncomplicated deliveries. Obstructed labor was the most commonly cited complication (7%). Some women also reported excessive bleeding (6%) and prolonged labor (3%). Most participants (55%) reported that their last child was large and weighed between 2.5 and 4 kg. A sizable proportion, 21%, reported that their child was very large (weighing more than 4 kg) (**Table 2**).

More than one-third of women (36%) stated that they had made a joint decision with their partners regarding where to deliver their child; 28% of women reported deciding independently, 24% cited that their partners had made the decision, and 9% cited that someone else had made the decision.

Women who reported joint decision making were significantly more likely to deliver at a health facility than women who reported making the decision independently, in both unadjusted and adjusted analyses (aOR: 4.5, 95% CI: 3.1-6.7) (**Table 3**). Additionally, women who reported that their partner made the decision were more likely to deliver at a health facility than women who reported making the decision independently, both in unadjusted and adjusted analyses (aOR: 3.3, 95% CI: 2.2-4.9). We observed no differences in the odds of obstetric complications among women reporting joint vs. independent decisions both in unadjusted and adjusted analyses (aOR: 1.2, 95% CI: 0.8-1.8) (**Table 3**). Similarly, we observed no differences in the odds of obstetric complications among women reporting partner vs. independent decisions both in unadjusted and adjusted analyses (aOR: 0.8, 95% CI: 0.5-1.2). According to the HL test, all models fit the empirical data well.

Discussion:

In this study, we observed that a significant minority of woman in rural Lilongwe District, Malawi delivered outside a health facility (25%) or without skilled assistance (31%). Additionally, compared to decisions made by women independently, obstetric decisions made jointly or by male partners were more likely to lead to facility delivery.

The obstetric care reported by this cohort of women in rural Lilongwe District, Malawi was consistent with findings from the 2010 Malawi Demographic and Health Survey (National Statistical Office & ICF Macro, 2010). Sizeable proportions of deliveries occurred outside health facilities and without skilled assistance, confirming continuing gaps in women's access to maternal health services. Importantly, facility delivery was not synonymous with skilled assistance among our participants; a proportion of facility based births had no skilled assistance. Our results are concerning given that the WHO considers skilled assistance (and not necessarily facility delivery) critical in improving maternal health (World Health Organization, 2004). Lack of transportation and distance to health facility together presented significant barriers to facility delivery for women in this study, as they do across sub-Saharan Africa (Anyait, Mukanga, Oundo, & Nuwaha, 2012; Gabrysch & Campbell, 2009). Furthermore, although the very low prevalence of obstetric fistulas in our population (one woman in our cohort, 0% of participants) was consistent with published estimates in sub-Saharan Africa (Adler, Ronsmans, Calvert, & Filippi, 2013), the prevalence of 'excessive bleeding' in our population (5%) was lower than expected. Estimates of the prevalence of post-partum hemorrhage in Africa range from 10% to 26% of all deliveries (Calvert et al., 2012; Carroli, Cuesta, Abalos, & Gulmezoglu, 2008). This discrepancy may be a result of the well-established regional variation in the prevalence of post-partum hemorrhage (Carroli et al., 2008) or the challenges of estimating blood loss and consequential misinformation of women as a result (Harrison, 2011; Yoong et al., 2010). The prevalence of low birth weight (<2500g) in our population, 11%, was consistent with WHO estimates for this region (13%). However, women in the study may have guessed the birthweight of their children – more than half of neonates in sub-Saharan Africa are not weighed at birth (World Health Organization, 2014). Our number as well as the WHO statistic of 13% likely underestimate the true prevalence of low birth weight. The proportion of babies weighing more than 4 kg was also likely an overestimate.

We found that women reporting joint decision making were more likely to deliver at health facilities, and, interestingly, that women reporting *partner* decision making were also more likely to deliver at health facilities than women reporting independent decision making. These findings suggest that male partner involvement in obstetric decision making (with or without joint decisions) improves uptake of maternal health services. A study of women in Uganda also reported that women who depended on their spouses to

make the decision about where to deliver were more likely to deliver at health facilities (Anyait et al., 2012). Our finding that partner decision making led to better obstetric choices than women's independent decision making could also illustrate women's limited autonomy within relationships. Women may need permission from their male partners to deliver at a health facility. Alternatively, women may be able to negotiate their obstetric preferences, but they may be unable to access key household resources – transportation or money for fees – needed to translate decisions into action (Blanc, 2001; Moyer et al., 2014). In our study population, male partner decision making may have led to facility delivery because male partners often control important household resources and are likely better able to mobilize those resources to act on their decisions (Nyanzi, Nyanzi, Wolff, & Whitworth, 2005). In contrast, although women may have preferred to deliver at a health facility, they may have been unable to mobilize household resources to support their decision (Moyer et al., 2014; Nyanzi et al., 2005).

Given that joint or partner decision making was associated with increased odds of facility delivery, we expected these exposures to be associated with decreased odds of obstetric complications (Bhalerao et al., 1984; Mullany et al., 2007), but this was not observed in our data even after adjustment for socioeconomic and demographic confounders. This lack of association could stem from a key limitation of our analysis of obstetric complications: differential misclassification. Women who experienced complications with their deliveries may have been less likely to report that they made the decision independently. These women may have been more likely to report joint or partner decision making. Although joint or partner decision making may have actually been associated with fewer delivery complications, differential misclassification in the pattern described above may have biased the observed associations toward null. Another possible reason for the lack of association between joint decision making and obstetric complications is that women who knew they were at risk of complications based on prenatal counseling may have been more likely to deliver at a health facility; joint decision making may not have appeared protective against complications in our analysis if women who experienced complications disproportionately delivered at health facilities.

Very few women in our sample experienced complications, limiting our analysis. It is possible that complications remain undocumented – especially those that occur during home deliveries or in the absence of skilled birth attendants (Harrison, 2011). Complications may also remain unreported, as they are often stigmatized in sub-Saharan Africa and considered to arise as a consequence of disobedience or adultery (Brighton, D'Arcy, Kirtley, & Kennedy, 2013). Additionally, given the relatively rare nature of complications even in low-resource settings, our sample size may have been too small to detect significant differences by decision-making status. A final limitation of our study was that we analyzed cross-sectional data. Further studies will need to develop interventions that facilitate joint decision making and examine their efficacy in improving obstetric choices and outcomes.

Our finding that joint decision making was associated with facility delivery provides support for the benefits of joint obstetric decision making in Malawi and elsewhere. Encouraging joint decision making could take the form of maternal health education interventions that involve both expectant women and male partners – similar interventions have been found to improve obstetric outcomes in India and Nepal (Bhalerao et al., 1984; Blanc, 2001; Mullany et al., 2007). Though our results support the idea that male participation in decision making can improve obstetric care, we present our findings with a note of caution: a male partner's involvement in obstetric decision making can be in direct conflict with a woman's autonomy (Rujumba et al., 2012; Thapa & Niehof, 2013). For example, inviting male partners to antenatal visits to increase their knowledge of obstetric complications may facilitate their participation in obstetric decision making. However, HIV testing is often integrated into antenatal care, and the presence of male partners at antenatal visits could jeopardize women's safety and decision-making power if women are found to be HIV-positive (Ditekemena et al., 2012; Rujumba et al., 2012; Thapa & Niehof, 2013). Interventions that facilitate communication between partners could improve both a woman's autonomy and a male partner's involvement in obstetric decision making (Thapa & Niehof, 2013).

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Figure Legends:

Table 1:

1: Characteristics of all women who specified at least one lifetime pregnancy

2: Participants could specify more than one answer

Table 2:

1: Includes all women who completed survey. All other analyses include only women who reported 1 or more lifetime pregnancies

2: Percentages may exceed 100% because participants could choose more than one response

* Percentages may not total to 100% due to missing responses

Table 3

1: Unadjusted

2: Adjusted for age, education, marital status, and household income

	Overall[1] N (%)		Non-HCF Delivery N (%)		HCF Delivery N (%)		No Complications N (%)		Complications[2] N (%)	
Education	**860**	**100**	**185**	**100**	**649**	**100**	**670**	**100**	**205**	**100**
None	70	8	26	14	42	6	62	9	9	4
1-3 years	249	29	65	35	180	28	212	32	42	21
4-8 years	418	49	84	45	320	49	315	47	114	56
Secondary	120	14	10	5	104	15	81	12	37	18
Beyond secondary	1	0	0	0	1	0	0	0	1	0
Household Income/ Month	**860**	**100**	**185**	**100**	**649**	**100**	**670**	**100**	**205**	**100**
< K5,000	298	35	70	38	221	34	246	37	54	26
K5,000 to K19,999	290	34	71	38	208	32	220	33	74	36
> K20,000	212	25	38	21	170	26	156	23	64	31
Relationship Status	**860**	**100**	**185**	**100**	**649**	**100**	**670**	**100**	**205**	**100**
Single	66	8	20	11	46	7	57	9	10	5
Married	794	92	165	89	603	93	613	91	195	95
	Median (IQR)		**Median (IQR)**		**Median (IQR)**		**Median (IQR)**		**Median (IQR)**	
Age	27	(22,32)	29	(24, 33)	26	(22,32)	27	(22,32)	27	(23,32)
Number of Children	3	(2,4)	3	(2,4)	2	(1,4)	3	(2,4)	2	(1,4)

Table 1. Characteristics of participants

	N	(%)
Number of total lifetime pregnancies[1]	**881**	**100**
0	21	2
1	153	17
2	175	20
3	157	18
4	141	16
5	110	12
6	66	7
7 or more	58	7
Location of Delivery*	**860**	**100**
Health Care Facility (HCF)	649	75
Home	90	10
Traditional Birth Attendant's Home	81	9
On the road to hospital/TBA	14	2
Reason for Delivering Outside of HCF	**860**	**100**
Lack of Transport	71	8
Labor occurred late at night	56	7
Distance	54	6
Labor came unexpectedly	13	2
No guardian	5	1
Fast delivery	8	1
Cost	6	1
Health care provider attitude	4	0
My husband/partner didn't want me to	4	0
Assistance at Delivery*	**860**	**100**
Doctor or Nurse	591	69
Traditional Birth Attendant	114	13
Relative	65	8
No Assistance	24	3
Obstetric Complications[2]	**860**	**100**
No complications	670	78
Obstructed labor	62	7
Excessive bleeding	52	6
Prolonged labor	25	3
Infection	19	2
High blood pressure	7	1
Convulsions	7	1
Obstetric fistula	1	0
Other	32	4
Birthweight*	**860**	**100**
2.5 kg to 4 kg	472	55
> 4 kg	177	21
< 2.5 kg	99	11
<1.5 kg	14	2

Table 2. Obstetric Care and Outcomes

Decision-Maker	HCF Delivery				Obstetric Complications			
	OR (95% CI)[1]		OR (95% CI)[2]		OR (95% CI)[1]		OR (95% CI)[2]	
Self	1.0 (Ref)	NA	1.0 (Ref)	NA	1.0 (Ref)	NA	1.0 (Ref)	NA
Partner	3.6	(2.5, 5.3)	3.3	(2.2, 4.9)	0.9	(0.6, 1.6)	0.8	(0.5, 1.2)
Both (Joint)	5.0	(3.4, 7.3)	4.5	(3.1, 6.7)	1.2	(0.8, 2.0)	1.2	(0.8, 1.8)
Someone Else	1.7	(1.0, 3.1)	1.6	(1.0, 2.7)	1.5	(0.6, 4.1)	1.6	(0.5, 5.1)

Table 3. Associations between decision maker, delivery location, and delivery complications