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Motivational Interviewing Intervention on Health-Seeking Behaviors of Pregnant Women in Western Kenya

Peter Gisore[1]
Child Health and Paediatrics Department, School of Medicine, Moi University

Dan Kaseje
Public Health and Vice Chancellor, Great Lakes University of Kisumu

Fred Were
Department of Paediatrics, School of Medicine, University of Nairobi

David Ayuku
Department of Behavioural Science, School of Medicine, Moi University

We studied the effect of using Motivational Interviewing Intervention (MII) on health facility delivery and newborn care practices among pregnant women receiving Care of the Mother and Newborn at Home (CNH) visits by Community Health Workers (CHWs). Near-Term women who had received at least one CHW home visit, were randomly assigned to one session of MII (intervention) or no MII (Control). Fifty five (55%) of intervention women, compared to 35% of control women delivered in health facilities. Intervention women also understood the need to breastfeed exclusively for 6 months better than controls (P = 0.000), and had a p-value of 0.07 for breastfeeding within one hour after birth. We concluded in the context of CHW Home visit program, adding may improve perinatal care.

Introduction

In the developing world, many mothers and their newborn infants die around the time of birth (Inter-agency Group for Child Mortality Estimation [IGME], 2012). For instance, in 2010, 99% of 287,000 mothers and about 3,000,000 newborns who died are from low-resource settings (IGME, 2012;

[1]Correspondence concerning this article should be addressed to Peter Gisore, Great Lakes University of Kisumu, P.O. Box 2224-40100, Kisumu, Kenya. E-mail: gisore2007@gmail.com

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World Health Organization [WHO], 2009). In Sub-Saharan Africa (SSA) alone, 1.1 million babies die within the first 28 days of life (IGME, 2012; Kinney et al., 2010). Currently, SSA has the highest proportion of newborn deaths in the world (United Nations Children's Fund, 2012). Within the last 10 years, the percentage of newborn deaths in Kenya has remained almost constant. In 2005, 34 newborns died out of 1,000 live births compared with the near similar figure of 31 out of 1,000 live births in 2008 (The Kenya Demographic Health Survey [KDHS], 2005, 2008). Similarly, maternal deaths were estimated to be about 480/100,000 (KDHS, 2008), with the rural poor having a higher average compared with the urban population (Edmond *et al*., 2008; KDHS, 2008). Whenever mothers die, their infants are at a higher risk of death as well. The majority of mothers and newborns die within the first week of life (Lawn *et al*., 2010). Newborn deaths make the highest proportion of under-5 deaths. Thus, among solutions sought to make community-based programs successful, those addressing maternal and newborns death (as part of under-5 deaths) at the time of delivery and soon after are important and urgent.

The value of health facility delivery, where quality care is provided, is understood by all healthcare givers and planners. It is accepted as the most effective approach to get better maternal and newborn health (MNH) results. However, ensuring health facility-based care for all the 50,000,000 births occurring at home annually is a challenge. Programmatic innovations, as an addition to health system strengthening, are needed. Some of these innovations should address the WHO-identified causes of failure to seek health care within the context of the three delays: "the delay in recognizing problems and deciding to seek care, the delay in transportation to reach appropriate care, and the delay in receiving appropriate care in health facilities" (Opportunities for Africa's Newborns, 2006; WHO, 2007). These delays manifest in many specific forms depending on the context. In Western Kenya, cultural beliefs and poverty cause ambivalence among pregnant mothers toward seeking care by skilled birth attendants. For instance, some hold a belief that one should not plan for their unborn baby. Such a plan, in their view, increases the chances of having a malformed baby. Some are also convinced that only weak women need to go to a hospital to deliver, otherwise the strong ones deliver at home. However, when you ask them, these same women know the medical dangers of home delivery. We suspected that these contrasting points of view have resulted in some going to antenatal clinics to obtain supplies such as antimalarial drug, vaccinations, and free mosquito nets, while remaining undecided on having a clear plan that will result in seeking care of skilled birth attendant or caring for their newborns using the conventional care guidance. If you asked why they delivered at home, they come up with a plausible explanation, likely to be due to these low levels of readiness to embrace formal healthcare services. Among

those who delivered at home, about 64% recognize problems that are likely to occur in a home birth, and 85% cite going into labor at night and/or fast progress of labor as their reasons for not seeking skilled care during birth (Van Eijk, 2006).

Mothers are expected to receive education for understanding the dangers of missing a skilled birth attendant at the time of birth through their antenatal clinic (ANC) attendance and through community health workers (CHWs). However, there is a lack of structured teaching methods for these mothers at the ANC setting. The booklets they carry have pictures one can easily use to understand dangers of pregnancy and identify sick infants. However, most mothers do not study this ANC booklet and are unaware of their contents since they see it as a health worker's record book. In some areas, partners are using targeted programs at the community level in intervening for increased health facility delivery. Targeted programs use standard information at the community level on individuals or groups of women to educate them on birth planning, and sometimes, screening them and their newly born infants for high-risk conditions with rapid transport to a facility for life-saving care have been studied (Ouma *et al.*, 2010). However, these have only partially succeeded since, even in research conditions, with these approaches a large proportion of mothers still deliver at home with an unskilled birth attendant. Thus, it is likely that targeted programs are being considered by some of the mothers as the "usual information from the ANC or from CHWs." In the study area, 90% of mothers attend at least one ANC visit, and there are several nongovernmental research and program partners covering most of the region. Even with this effort, health facility delivery is reported to average 27% (KDHS, 2008). Targeted programs offer advice and provide information mainly to these mothers. In the research done since motivational interviewing intervention (MII) was started, offering advice and knowledge have universally been found to be the cause of resistance to change (Miller, 2009). MII protocol does not include giving unsolicited advice or supplying knowledge, since it recognizes that unsolicited advice could increase resistance to behavior change. Where it has been used to complement programs in a tailored way, it has been found to be synergistic in producing better results. In addition, MII seems to work better in the marginalized and disadvantaged populations with low readiness to change. MII has spread all over the world, but little of it is in use in Africa where it is rarely applied even in psychology, where it originated. It has consequently not been well studied for increasing healthcare delivery, since the problem is seen mainly in the developing world context. Thus, by finding the near-term pregnant mothers through a community-based health information system (CBHIS), this study sought to establish the evidence base for its use, to fill both the programmatic and evidence gaps.

Methods

The Study Population

The study was done in Western Kenya where household survey by CHWs using CBHIS tools was done every 3 to 6 months in a population of about two million inhabitants. All near-term pregnant women in the database registered between July and October 2011 were eligible. Although the majority of the women in these areas have elementary-level of education, most speak fluent Kiswahili, the national language in Kenya. The socioeconomic status of the community is low, with most families depending on small-scale farming for daily subsistence.

They receive health care from nearby health facilities, and those having skilled birth activities serving up to 5,000 households. The majority of these facilities are not busy since this population has the highest rate of home delivery in the country (79% in some places). Mosquito nets are supplied at no cost to the household through these health facilities, except that of collecting it and using it in the household. It is common cultural practice for near-term pregnant mothers to move back to their maternal homes, usually not in the same location as their marital homes, to deliver there.

Design and Approach to Implementation

This was a double-blind, parallel-group conducted in the rural Western Province of Kenya. The participants were near-term pregnant women identified by CHWs through CBHIS data. Thus, the randomized women were among those being followed up using an established system. In this system, household registration of all women of reproductive age was regularly done, and those with near-term pregnancy were given care of the Newborn at Home visits. These are designed to be two visits before birth and three visits after birth. The antenatal visits are designed to give the woman information to make a birth plan. Those visits after birth were designed to identify newborns, and sometime mothers, with danger signs and to advice care in an appropriate setting.

First, we determined the number of CHW areas likely to achieve the desired sample of 320 women and names of CHWs were randomly picked to the desired number. Then the list of near-term pregnant mothers corresponding to the identified CHWs was extracted from the database and sent to an independent statistician for randomization in blocks of 20 mothers by the program manager. The statistician used password-secured e-mail to send the list of randomized women and their details, sufficient to identify their households and gestation, to the intervention arm to the MII provider. The four MII providers held meetings once they received a list to determine when they should visit each woman listed and

their approach to reaching each woman. They used available infrastructure in the village, including village administrators, women groups, and CHWs, to identify these women. Varied venues ranging from the households to dispensaries ended up being used for this intervention, mainly determined by the pregnant woman herself. Mothers whose expected dates of delivery were nearing were prioritized in the visits. The details of those found and interviewed were received from the MII providers by the program manager. An independent group collected outcome data by interviewing all the enrolled women at the end of the intervention and after at least 28 days following delivery.

Training of MII Providers

A behavioral scientist prepared the training materials and gave a 4-day residential training to the four MII providers. Out of the four providers, one was a retired nurse, one had a diploma in community development, one had a bachelor's degree in human resource development, and one was a trained secretary. Two of the providers could speak the local language, while the other two could not.

Once the four trained providers of MII were ready to go to the field, we got the randomization process started. The primary researcher gave the independent statistician the e-mail address of one of the MII providers and told him to mail the list with the intervention group. The MII providers confirmed receipt of the list. The researcher told the MII providers to divide the women in the list and use the available resources in the community, including CHWs, to find them and do MII on them. Each MII would report every day how many women they have interviewed through short message service to the researcher, and the program manager followed up with a meeting between the provider and the pregnant woman. At the end of the activity, they e-mailed the full list of women they interviewed to the primary researcher.

Finding Near-Term Pregnant Women in the Community

To identify near-term pregnant women in the village was difficult. The MII providers and the data collection team travelled with locally available transport, popularly known as "boda boda," which are bicycles and motorcycles for hire. Rain slowed them down sometimes. Balancing the schedule of their guide and the pregnant women took time as well. However, there was mostly enough time to find them between identification and delivery since we included all women in the third trimester and the interview took place only on one meeting occasion.

Sample Size and Data Analysis

Hence, using a power of 80% and a significance level of .05, we estimate the following sample size per arm was 148. The outcome data were entered in database developed using the SQL server program and the entry interphase using the Visual Basic 2005 (VISUAL BASIC 2005 AND DATABASES provided by CBSinteractive Inc.) programs. Data forms that were not clear were left out. Using the details from the randomization list and the actual interviewed women, the data of the women who had actual MII were separated from those who did not receive it. The two groups were checked for comparability, and once it was determined that the demographic characteristics were similar, their outcomes were analyzed using Stata version 10 (StataCorp LP, 4905 Lakeway Drive, College Station, TX 77845, USA) program.

Results

The 320 near-term pregnant mothers were randomized into two equal arms of 160 each. In the intervention arm, 27 did not be receive MII intervention for various reasons. The explanations for these 16.9% (27/160) who missed out include:

13 had delivered by the time they were found;
10 moved back to their maternal home to deliver;
4 could not be traced.

Thus, 133 mothers receive MII treatment.

The data collectors found a different set of women from the intervention and control groups in their household compared with those who had received the intervention. They traced 146 (missed 14) women in the intervention arm and 144 (missed 16) women in the control group via independent volunteer research. Of the 14 in the intervention group who were missing, 11 were reported to be away at their maternal homes and three were not known by the names given to the CHW data and thus could not be traced by data collectors. Among these, six had not received MII and nine had. Of the 16 who were missing from the control group, nine were away in their maternal homes and seven were not known in the villages by the names they gave, thus no one could identify them.

Among those on the MII list who were found (146), when the list was compared with that given by the MII providers, 21 were among the ones who had not received MII. Since the demographic characteristics of the 21 were similar to the intervention and control groups, they were included in the controls. Thus, analyzed were 123 MII mothers and 160 controls (Figure 1 and Table 1). Out of all

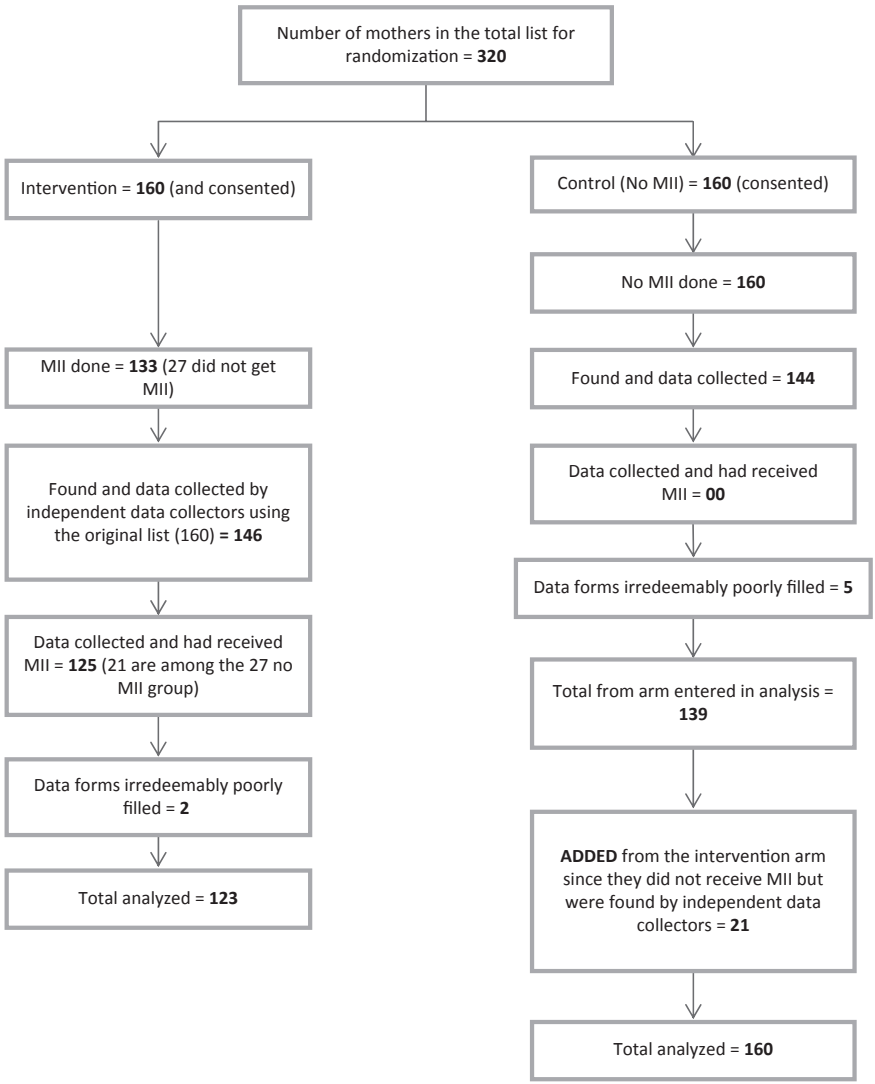

Figure 1. Consort chart.

data forms collected, seven data forms (two in the intervention and five in the control) were poorly filled and further cleaning was not possible, thus these were excluded from the analysis.

The demographic characteristics of the mothers were similar in both groups (see Table 2). Since mothers were under no obligation to give answers to

Table 1

Consort Table

Number of names of near-term informed mothers sent to independent statisticians	320	
Treatment	MII	No MII
Randomized	160	160
Consent to participate	160	160
Number of mothers treated with MII	133	–
Number of mothers on whom data was collected	146	139
Number of mothers with data collected on who was not done in the MII group or interview was done in the no MII group	21	00
Number of mothers whose arm was changed	21	00
Number of mothers whose data forms were available for entry	125	165
Data form poorly filled (useful data could not be extracted)	2	5
Number of entries analyzed	123	160

questions they did not feel comfortable answering, the denominator in all the rows are varying by response. The results (Table 3) show an increase in health facility delivery +20% (CI: 6%–32%), an increase in home delivery of borderline significance +10% (CI: –1%–23%), and a reduction in delivery by traditional birth attendants –15% (–19%–11%). It also shows those who received the intervention knew more than two newborn danger signs compared to those in the control arm, 15% (CI: 5%–26%). They also used mosquito nets more than controls.

Discussion

Mothers who received MII had better utilization of skilled birth attendants and newborn care practices. These mothers who received counseling had a significantly higher number of deliveries in the health facility. It shows MII might have made these mothers reflect on what they know to be beneficial, and act in a way to preserve their well-being and that of their unborn infant. Even when they might not overcome the economic barrier, they seem to still make a choice to stay at home, instead of giving their resources to unskilled birth attendants. This is illustrated by the higher number of those who deliver at home and the reduction in the numbers

Table 2

Maternal Demographic Characteristics

	Treatment		
	Randomized to MII intervention	Randomized to control group	*Randomized to MII but have not received MII treatment
Deliveries, *n*	144	141	21
	Education		
Maternal education, *n* (%)	144	141	21
No formal schooling	3 (2.10)	3 (2.13)	1
Primary	83 (60.28)	85 (57.34)	12 (57.14)
Secondary	54 (37.76)	53 (37.59)	7 (33.3)
Postsecondary	4 (2.80)	0 (00)	1
	Age		
Maternal age Number for whom the data were available (range, mean, standard deviation)	140 (range 14–44, mean 26.85, standard deviation 5.76)	142 (range 17–45, mean 27.01, standard deviation 5.72)	19 (range 15–45, mean 26.93, standard deviation 5.76)
	Parity		
Parity, *n* (%) Number for whom data were available)	143	140	20
1–4	38 (25)	38 (26.57)	6 (28.5)
>4	106 (75)	105 (73.43)	15 (71.4)
Antenatal care, *n* (%)	144	141	21
One or more visits	139 (96.5)	136 (95.10)	20 (95.2)
No antenatal care	5 (3.50)	7 (4.90)	1

*A subset of those included in the randomized to MII group but did not receive the intervention (not traced). However, their data were obtained by the independent clerks after 28 days of their delivery.

Table 3

Newborn Care, Knowledge, and Practice Outcomes

	Treatment				
	MI and CNH (Intervention)	CNH (Control)	Difference	Confidence interval	*P* value
n, total number of respondents	124	160			
Table A: Good care practices					
Breastfed within 1 hour of birth	42.7% (53/124)	32.5% (52/160)	+10.5%	2.13 (−.81% to 21.81%)	.07
Understood the need for exclusively breastfeeding for 6 months	90.8% (109/120)	65.2% (101/155)	25.6%	(.90% to 50.2%)	<.0001
Table B: Knowledge on care of newborn					
Knew more than one infant danger sign	62.9% (78/124)	47.8% (77/160)	+15.1%	(3.63% to 26.56%)	.01
Table C: Delivery practice					
Delivery by skilled birth attendant	56.4% (70/116)	35.8% (56/156)	+20.6%	(9.08% to 32.12%)	.001
Delivered at home	44.6% (54/121)	33.7% (52/154)	+10.9%	(−1.23 to 23.03)	.06
Delivered by TBA	6.6% (8/121)	21.4% (33/154)	−14.8%	(17.7% to −25.06%)	.001
Table D: Utilizes available free healthcare supplies					
Uses mosquito net to prevent malaria	98.5% (130/114)	88.9% (122/155)	+6%	(.32% to 11.68%)	.0434

TBA = traditional birth attendant.

of those delivered by birth attendants. On the other hand, some mothers received and still utilized home-based unskilled birth attendants. Studies on pregnant mothers using this MII have only previously been done on women who have either drug, alcohol, or smoking problems (Barnet *et al*., 2009; Hajek *et al*., 2001; Petersen *et al*., 2007; Tappin *et al*., 2000; Valanis *et al*., 2001); more recently, scientists are looking at using MII to promote healthy behavior among pregnant women (Warren *et al*., 2012). The effectiveness of MII demonstrated in this context might be related to its difference from the approach of ANC attendance messages. In Kenya now, unlike in the past, healthcare workers are friendlier in these clinics. Considering that 90% of these mothers attend their ANC, receive counseling and information but chose to deliver at home, MII may have resulted in better in-depth reflection on the risks they are taking. This further suggests that these mothers might not have been resistant to change, but rather that they had been using health care as a routine without looking at the benefits accrued.

The idea of in-depth reflection is supported by the significant attention to recalling infant danger signs that were taught to them after the MII and increased use of the mosquito net to prevent malaria. The CMNH program introduces pregnant mothers to the danger signs to watch for telling when the infant is ill. Those who had MII seemed to recall more signs than those who did not.

The mosquito nets received at no additional cost to households in this malaria-endemic area are sometimes not used for the intended purpose. Anecdotal observation has shown that other uses, including acting as seat covers, happen in Western Kenya. It is thus clear that MII seems to have not only addressed the issues of seeking to commit to one's plan, but also appears to have helped in self-reflection on the dangers of other illnesses such as malaria.

Weaknesses in this study were likely to arise from the MII being provided by persons whose background is not in psychology. However, MII is known to be provided successfully by lay providers. It is also possible that the trainers for MII providers, not being part of the internationally certified MII training team, may not have provided adequate training to the providers. However, care was taken to use the best qualified psychological counselors in the setting, who were given the materials to prepare for this training and were given 4 days to provide training to the MII providers.

Conclusion

This study has shown that using MII with a maternal education program near-term is superior than the maternal education program alone.

Recommendation

This program has programmatic, academic, and research implications.

Programmatic Implications

There is value in trainers of healthcare providers, within programs, in maternal and newborn health in teaching MII. Motivational interviewing could be done along with the programs to increase the benefits from these programs.

Academic Implications

There is value in trainers of healthcare providers within academic institutions in maternal and newborn health in teaching MII. This should be established in the formal MII channels to achieve successful training and skill sustenance. Motivational interviewing could be done along with the programs to increase the benefits from these programs.

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