

Changes in Men's Knowledge & Attitudes Following Health Education on their Role in Preventing Maternal Deaths: An Exploratory Survey in a Nigerian Community

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Abstract

Background: In developing countries, men are sometimes stereotypically perceived as uninterested in maternal health, but their reproductive health roles have been widely recognized. Some studies have suggested that effective communication with men on safe motherhood can yield behavior changes capable of reducing maternal deaths.

Aim: This study's objective was to study the impact of an educational session on the knowledge and attitudes of married men regarding maternal deaths.

Design: Men were interviewed before the intervention and then participated in a joint educational session on safe motherhood. Follow-up interviews took place three months after the intervention.

Results: 141 randomly selected men enrolled in the study; 122 completed both interviews. After the

session, men were more likely to recognize a danger sign of pregnancy and delivery, but there was no increase in their willingness to participate in making the local hospital better for maternal healthcare. Mean composite scores increased significantly.

Conclusions: Married men have moderate knowledge about maternal deaths and are potentially educable regarding their prevention. Further controlled intervention programs and studies are recommended.

Introduction

In developing countries, men are sometimes stereotypically perceived as uninterested in maternal health,¹⁻⁴ but their reproductive health roles have been widely recognized.⁵⁻⁷ Their dominant roles as gatekeepers, decision makers, and resource controllers in their partners' reproductive health matters are usually understood in the context of culture-based gendered norms.⁸⁻²¹ Building on this, some studies have suggested that effective communication with men on safe motherhood can yield behavior changes capable of reducing maternal deaths.^{11,12,21-26} Desired male roles include avoiding and disapproving of marriages with underage females,^{27,28} using and approving of the use of reproductive health services,^{11-13,23,29-31} and providing and permitting support for their wives' obstetric care, especially during emergencies.^{11,25}

Promoting these roles in Nigeria is pertinent because the maternal mortality ratio in the country, according to 2013 Nigeria Demographic and Health

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Submitted: 1/28/2016

Revised: 3/21/2016

Accepted: 6/21/2016

Conflict of interest: None

Survey (NDHS), is still as high as 576 per 100,000 live births.³² This is a far cry from the targets of 125 by 2010 and 75 by 2015.³³

There have been few studies in Nigeria on the potential role of educating men as a way of reducing maternal mortality. One of the earliest of such studies, conducted in Ibadan, used a before-and-after design and found that, following health education, men's knowledge, attitude, utilisation, approval, and ability to communicate with their spouse about family planning all improved.²⁶ In another before-and-after study in Kebbi State, men were successfully educated about the need to avoid underage marriages and the need for emergency obstetric care.²⁴ In a quasi-experimental study in Kaduna State, men's birth preparedness practice did not improve six months after health education, possibly because of their religious beliefs.³⁴ A recent systematic review of intervention studies on birth preparedness and complication readiness in developing countries demonstrated the paucity of intervention studies involving men.³⁵ This is regrettable because such studies are needed inform to larger countrywide interventions.

This study's objective was to study the impact of an educational session on the knowledge and attitudes of married men regarding maternal deaths and the factors that might be associated with changes in these attitudes. We were also interested in knowing whether men were willing to participate in such education.

Methods

This study is part of a larger study on male involvement in reproductive health.^{11,12} It was conducted in Ekiadolor, a suburb of Benin City, Nigeria. The community is strongly patriarchal. Most people live on less than US\$1 daily and there is virtually no reproductive health education program available for men. The main health facility that provides basic maternal health services in the community is ill-equipped and poorly staffed. Women who use this facility rely on hospitals in Benin City for some routine and virtually all interventional obstetric services.

Study population

The study population consisted of married men, aged 18 years and above, who were permanent residents in the community.

The minimum sample size, n , for the study was determined using the sample size estimation for binomial tests (two-tail alternative).³⁶ Assumptions for the computation were a standard normal deviation (Z) of 1.96 and a power of 80%. With a baseline measure of 13% (percentage of men who stated the importance of delaying marriage in a previous Nigerian study)²⁴ and allowance made for a post-intervention change of 10% (or more), a minimum sample size of 103 was obtained.

All selected individuals were contacted in their houses and those who gave informed consent were enrolled for the study.

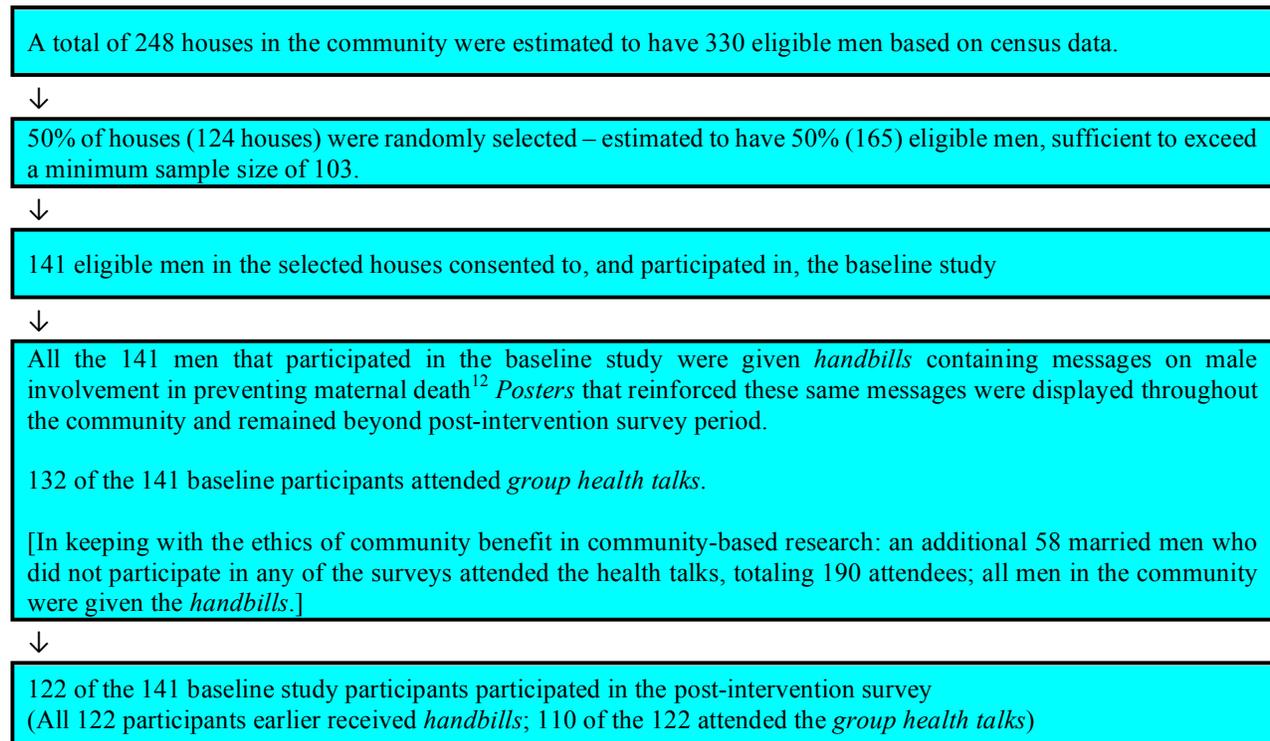
Ethical approval

Ethical approval for the study was given by the Research Ethics Committee of the University of Benin Teaching Hospital, Benin City, Nigeria, based on the principles of the Helsinki Declaration.

Study design

The study employed an exploratory before-and-after design. It consisted of a pre-intervention survey, a two-hour educational session (the intervention), and a post-intervention survey administered three months after the intervention. Both surveys were conducted using a pretested interviewer-administered structured questionnaire covering participants' demographic characteristics and knowledge (13 questions) and attitudes (15 questions) regarding their roles in reducing maternal death. Correct answers reflected key health education messages and were derived from contemporary literature on maternal health.^{24-26,37,38} The questions and messages were further reviewed for content validity by three reproductive health experts working independently. The baseline survey questionnaire included questions on participants' names and residential addresses for post-intervention tracking. The various health education materials, activities and participants are outlined in the Figure (p. 43).

**Figure:
Flow chart of participants**



The health education messages and methods of delivery (printed materials and health talks) were adapted to the community's characteristics.^{11,12} With the assistance of persons knowledgeable in the local culture, additional caution was exercised to ensure cultural appropriateness (such as using culturally accepted euphemisms for words like 'vagina' and 'penis') and social appeal (such as the diagrammatic depiction of couples in local attire and typical settings). The printed aids were designed, pretested, standardized, and adapted in line with these qualities in a community with identical socio-cultural characteristics. A non-contiguous community was used for all pretests to obviate a spillover effect in the study. The health talk sessions were facilitated by a male public health physician trained in health education. Geo-cultural settings guided the identification of eight groups of men as targets for health education. One group was the community's Council of Elders (the local traditional authority). One group from each of the seven quarters of the community made up the remaining seven groups. Each group consisted of 4 to 30 men. One health talk

session per group was conducted, each lasting for an average of 2 hours. The health education program was conducted immediately after the baseline survey. Two theoretical lenses – gender theory and the local cultural context – were used to develop and implement the health education program. A detailed conceptual analysis of the health education program, using these lenses, forms the subject matter of a separate publication.¹²

All pre-intervention participants were eligible for the post-intervention survey which was conducted three months after the health education program. The data of pre-intervention participants who did not participate in the post-intervention survey was excluded from the final results and analysis in order to eliminate attrition bias.

Analysis

SPSS version 20 was used for data analysis. Data was initially disaggregated to present the number and percentage of respondents that gave correct answers pre- and post-intervention for each of the 28 items. The percentage difference for each item (post-

intervention minus pre-intervention, denoted as d) was also calculated. A composite score was computed for each respondent by assigning a score of 1 to each correct answer and 0 to each wrong answer and representing the sum of the correct answers as percentage of the total. A mean composite score, C , was computed for the total sample pre- and post-intervention – C_1 and C_2 respectively and the difference (C_2 minus C_1) denoted as D . Values of d and D were given a '+' sign if there was an increase and a '-' sign if there was a decrease.

Five sets of analyses were conducted. First, for each of the 28 items, the difference between the proportions of respondents that provided correct answers was presented; this difference was tested with chi-squared test and its percentage (d) presented along with the 95% confidence interval (CI). Secondly, D for total scores was tested for statistical significance with the paired t test and presented with its 95% CI. Thirdly, socio-demographic categories of D were tested for statistical significance with the paired t test and presented with their 95% CI. Fourthly, C_1 and C_2 were tested for association with socio-demographic characteristics, using the independent t test and ANOVA as applicable. Fifthly, socio-demographic categories of D were compared in a test of association, using the independent t test and ANOVA as applicable. Analyses for point and interval estimates were done using WinPepi® (Computer Programs for Epidemiologists) version 11.10. In all analyses, statistical significance was set at $p < 0.05$ and a 95% confidence interval that excluded the null value of 0.

Results

All the 141 eligible participants consented to the study at the pre-intervention stage. The response proportions for the health talks and post-intervention survey were 93.6% (132/141) and 86.5% (122/141) respectively. Of the 141 participants in the baseline survey, all (100%) received handbills and 132 (93.6%) participated in group health talks. Of the 122 participants in the post-intervention survey, 10 (90.2%) attended the preceding health talk sessions (Figure)

The mean age of the 122 men was 43.3 (SD, 15.0) years. About three-fifths, 74 (60.7%), had at least

attempted secondary education; 53 (43.4%) were subsistence farmers; and 92 (75.4%), were Christians.

Table 1
Demographic characteristics (n=122)

Demographic characteristics	Frequency (%)
Age	
18-24	13 (10.7)
25-39	46 (37.7)
40-59	41 (33.6)
60-75	22 (18.0)
Educational level	
None and primary	48 (39.3)
Secondary	53 (43.4)
Tertiary	21 (17.2)
Occupation	
Subsistence farmers	53 (43.4)
Traders & artisans	27 (22.1)
Administrative workers & teachers	20 (16.4)
Students	7 (5.7)
Religious workers & musician	5 (4.1)
Unemployed	10 (8.2)
Religion	
Christianity	92 (75.4)
Traditional religion	18 (14.8)
Islam	5 (4.1)
Others	7 (5.7)

As shown in Table 2, patterns of changes in knowledge varied following health education. Large improvements ($p < 0.05$) were observed for the knowledge of non-surgical family planning methods for females, such as oral pills ($d = +50.9$), the male condom ($d = +46.7$), and key warning signs of maternal death (such as hemorrhage ($d = +17.2$)). The intervention appeared to have yielded only marginal increases ($p > 0.05$) for the knowledge that a woman could be unwell due to pregnancy and delivery and the knowledge of a natural family planning method for females, such as the rhythm method. The pre- and post-intervention percentages remained high for the former and low for the latter. Vasectomy and bilateral tubal ligation were the least known and remained poorly known, although there was significant

Table 2: Changes in knowledge

Item	Number of persons who gave correct answers (%)		Percentage difference: <i>d</i> (95% Confidence interval)	<i>p</i>
	Baseline	Post-intervention		
<i>Responses that showed significant increase</i>				
At least one modern non-surgical family planning method for women	27 (22.1)	89 (73.0)	+50.9 (+39.2 to +62.4)	< 0.01
Male condom	42 (34.4)	99 (81.1)	+46.7 (+34.9 to +56.6)	< 0.01
Stated at least one key symptom of major conditions leading to maternal death	32 (26.2)	53 (43.4)	+17.2 (+5.3 to +28.5)	0.01
Bilateral tubal ligation	0 (0.0)	18 (14.8)	+14.8 (+7.6 to +21.9)	< 0.01
Recommended minimum interval between births	96 (78.7)	114 (93.4)	+14.8 (+6.1 to +23.4)	< 0.01
Minimum age for a female to become pregnant or be “given out” in marriage	96 (78.7)	111 (91.0)	+12.3 (+3.3 to +21.3)	< 0.01
At least one natural family planning method for men	13 (10.7)	26 (21.3)	+10.7 (+1.4 to +19.8)	0.02
<i>Responses that showed minimal increases</i>				
Knew that a woman can be unwell as a result of pregnancy and delivery	81 (66.4)	92 (75.4)	+9.0 (-2.4 to +20.1)	0.12
At least one natural family planning method for women	22 (18.0)	33 (27.0)	+9.0 (-1.5 to +19.3)	0.13
Vasectomy	2 (1.6)	6 (4.9)	+3.3 (-2.3 to +9.4)	0.28
Recommended maximum number of children per woman	53 (43.4)	55 (45.1)	+1.6 (-10.7 to +13.9)	0.80
Baby’s age before weaning	23 (18.9)	24 (19.7)	+0.8 (-9.1 to +10.7)	0.87
<i>Response that showed a decrease</i>				
How long after delivery a baby should be put to breast	28 (23.0)	16 (13.1)	-9.8 (-19.4. to -0.1)	0.05

increase for the latter. Only one decrease in knowledge score was observed. Varying patterns of change were also observed with attitude responses (Table 3). Significant improvements ($p < 0.05$) were observed for knowing that the number of desired children should be the couple’s decision ($d = +28$) and that family planning methods are meant to be used by both male and female partners ($d = +13.9$).

High baseline percentages still allowed for significant increases to 100% for variables such as identifying the modern health facility as the best place for antenatal care and for delivery. Baseline percentages that were $\geq 95.9\%$ (117/122) did not have sufficient deficits to permit more than marginal increases as seen in the respondents’ scores in willingness to provide money for their partners’ care

Table 3: Changes in attitude responses

Item	Number of persons who gave 'good attitude' answers (%)		Percentage difference: <i>d</i> (95% Confidence Interval)	<i>P</i>
	Baseline	Post-intervention		
Responses that showed significant increases				
Who should decide on the number of children a couple should have?	39 (32.0)	74 (60.7)	+28.7 (+16.3 to +39.9)	< 0.01
Who could use family planning methods?	3 (2.5)	20 (16.4)	+13.9 (+6.8 to +21.7)	< 0.01
Is it acceptable for your wife to go to the hospital in your absence?	107 (87.7)	121 (99.2)	+11.5 (+5.5 to +18.5)	< 0.01
Where is the best place for antenatal care?	110 (90.2)	122 (100.0)	+9.8 (+4.7 to +16.4)	< 0.01
Where is the best place for delivery?	111 (91.0)	122 (100.0)	+9.0 (+4.1 to +15.4)	< 0.01
Assent to interventions recommended by health care givers?*	111 (91.0)	122 (100.0)	+9.0 (+4.1 to +15.4)	< 0.01
Take all possible actions in the best interest of her health?*	115 (94.3)	122 (100.0)	+5.7 (+0.8 to +11.9)	0.01
Arrange for her transport to the hospital if the need arises?*	116 (95.1)	122 (100.0)	+4.9 (+0.1 to +10.8)	0.03
Accompany or take her to the hospital?*	116 (95.1)	122 (100.0)	+4.9 (+0.1 to +10.8)	0.03
Responses that showed minimal increase				
Is it acceptable for another person to help your wife to the hospital in your absence?	115 (94.3)	121 (99.2)	+4.9 (-0.5 to +11.1)	0.07
Arrange for people to support you in helping her if necessary?*	111 (91.0)	117 (95.9)	+4.9 (-1.5 to +11.7)	0.12
Provide money for her medical and general care?*	117 (95.9)	122 (100.0)	+4.1 (-0.5 to +9.8)	0.06
Encourage her to go to the hospital?*	119 (97.5)	122 (100.0)	+2.5 (-1.8 to +7.6)	0.25
Is it necessary to educate men about their roles in safe motherhood?	115 (94.3)	118 (96.7)	+2.5 (-3.2 to +8.4)	0.36
Response that showed a decrease				
Are you willing to make the local hospital better for maternal health care	99 (81.1)	98 (80.3)	-0.8 (-10.7 to +9.1)	0.87

* Whether respondents would do the indicated actions if their wives developed a complication during pregnancy or delivery.

and to encourage them to seek care. High baseline scores contributed to other variables having only marginal improvements. Only one decrease in attitude score was observed.

Table 4 (see page 47) shows that $C_1 = 59.1\%$ (SD, 11.0%) and $C_2 = 69.7\%$ (SD, 7.6%), showing

less than two years after preceding births and that 77.7% of currently married women 45 – 49 years old have had five children or more.³² Findings elsewhere in Nigeria^{30,31,44} and other African countries⁴⁵⁻⁴⁷ suggest that men's attitudes contribute to their female partners' contraceptive choices and practices.

Table 4
Composite scores, changes in composite scores and tests of association (n=122)

Variables and tests	Categories	Mean composite score		Analyses of difference	
		Pre-intervention: C_1 (SD)	Post-intervention: C_2 (SD)	Difference ($C_2 - C_1$): D (95% CI)	t test
[Total: N = 122]		59.1 (11.0)	69.7 (7.6)	+10.6 (+8.4 to +12.7)	$t = 9.58$ $p < 0.01$
Age in years	18 – 39 (n = 59)	59.8 (11.8)	70.6 (7.4)	+10.8 (+7.6 to +14.1)	$t = 6.71$ $p < 0.01$
	40 – 74 (n = 63)	58.4 (10.3)	68.8 (7.8)	+10.4 (+7.3 to +13.4)	$t = 6.78$ $p < 0.01$
t test		$t = 0.70$ $p = 0.49$	$t = 1.31$ $p = 0.19$		$t = 0.21$ $p = 0.83$
Educational level	Less than secondary (n = 48)	57.8 (8.2)	68.2 (6.7)	+10.4 (+7.2 to +13.5)	$t = 6.5$ $p < 0.01$
	Secondary and above (n = 74)	59.9 (12.5)	70.7 (8.0)	+10.8 (+7.7 to +13.8)	$t = 7.09$ $p < 0.01$
t test		$t = 1.03$ $p = 0.31$	$t = 1.79$ $p = 0.08$		$t = 0.19$ $p = 0.86$
Occupation	Farmers, traders and artisans (n = 80)	58.2 (10.3)	69.0 (7.1)	+10.9 (+8.2 to +13.5)	$t = 8.24$ $p < 0.01$
	Other employed persons (n = 25)	59.3 (14.2)	70.9 (9.0)	+11.6 (+5.5 to +17.6)	$t = 3.94$ $p < 0.01$
	Students and unemployed (n = 17)	63.2 (8.5)	71.2 (7.8)	+8.0 (+2.5 to +13.4)	$t = 3.10$ $p = 0.01$
ANOVA		$F = 1.45$ $p = 0.24$	$F = 0.98$ $p = 0.38$		$F = 0.48$ $p = 0.62$
Religion	Christianity (n = 92)	59.9 (11.3)	69.8 (7.5)	+9.9 (+7.3 to +12.4)	$t = 7.68$ $p < 0.01$
	Others (n = 30)	56.5 (9.8)	69.4 (8.1)	+12.9 (+8.4 to +17.3)	$t = 5.93$ $p < 0.01$
t test		$t = 1.48$ $p = 0.14$	$t = 0.25$ $p = 0.80$		$t = 1.17$ $p = 0.25$
Ethnic group	Bini (n = 79)	59.7 (11.1)	70.3 (8.4)	+10.7 (+7.8 to +13.5)	$t = 7.50$ $p < 0.01$
	Others (n = 43)	58.0 (11.0)	68.5 (5.8)	+10.5 (+6.9 to +14.0)	$t = 5.94$ $p < 0.01$
t test		$t = 0.81$ $p = 0.42$	$t = 1.25$ $p = 0.21$		$t = 0.09$ $p = 0.93$

The very low proportions of men who stated tubal ligation and vasectomy as contraceptive methods probably reflects the uncommonness of and possible disinclination for these procedures as corroborated by studies elsewhere in Nigeria and other African countries.^{32,48,49}

The low percentages of respondents, pre- (26.2%) and post-intervention (43.4%), that could state at least one key danger sign of pregnancy or delivery is worrisome. Similarly, only 26.9% of men in a Nepalese study could state at least one danger sign of pregnancy.⁵⁰ This ignorance could lead to failure to

recognize and seek emergency obstetric care.²¹ One study in southern Nigeria found that community education on men's roles in reproductive health improved the likelihood that couples would report willingness to seek emergency obstetric care when required.⁵¹

A large majority of participants expressed good attitudes that indicate inclinations to overcome possible logistic, financial and decisional barriers to obstetric care. In some African studies, men were observed to be inclined to present themselves as considerate and protective of their wives' wellbeing contrary to the self-portrayal of women as uncared for.^{52,53}

The significantly improved preference for joint decision making on parity is important because it portrays willingness to empower women and may portend wider reproductive health choices for them.⁵⁴

The finding that men were well disposed to accompanying their wives to the hospital if there was a medical complaint during pregnancy and delivery is also encouraging. In a Malawian study, men were reported to accompany their wives to the hospital, despite the absence of a complaint and in a community where the practice was against the social norm.¹⁷ In another Malawian study, this practice was seen as a show of love for the wife¹⁸ and, in a Guatemalan study, to connote psychosocial support for her.¹⁹ A recent Zambian study indicates that women were more likely to deliver in a health facility if they were accompanied by their male partners during antenatal care.⁵⁵ If a wife has an obstetric complaint, an accompanying husband is able to provide decisional, logistic, and financial support as she plays the sick role. Such support may shorten the delays that may increase the risk of maternal death.

The essentially unchanged proportion (nearly one-fifth) of respondents who did not express willingness to contribute to improved maternal health services in the local hospital, despite health education, illustrates the limitation of health education alone in producing expected results. The finding is traceable to poverty and a poor sense of community ownership and participation.

The overall opinion expressed by almost all the participants (pre- and post-intervention) that it is necessary to educate men on their roles in safe

motherhood is encouraging as it suggests that they are interested in being more involved. The high response proportions in the baseline survey, health talk sessions and post-intervention survey support this view. These findings suggest that large-scale studies and programs are feasible. In addition, given the high proportion of men who offered good attitude responses and the statistically significant improvement in these proportions following health education, it may be inferred that men in the study population are educable on maternal health. The low percentages of men that gave correct responses to many of the knowledge questions, even after health education, point to knowledge gaps requiring further education and, perhaps, other interventions.

Baseline and post-intervention mean composite scores for the total sample and the improvements observed were moderate. The absence of association between mean composite scores and the observed improvement on one hand and socio-demographic variables on the other hand suggests that, for these variables, the study population was largely homogenous. Information sharing at domestic and communal interactive levels may explain the homogeneity. The findings also suggest that beneficial intervention studies and programs simultaneously targeting men with a wide range of differing socio-demographic characteristics are plausible.

Despite the useful findings in this study, full attribution of outcomes to intervention is untenable because of the uncontrolled before-and-after design, intended only as exploratory. Besides, the self-reported good attitude may have been exaggerated. Nevertheless, limited attribution is possible because of the absence of other known interventions, such as other reproductive health education programs that could explain the observed changes, and the interview of the same participants pre- and post-intervention, thus eliminating attrition bias.

Conclusions

This study has demonstrated that men have the ability to learn about maternal health and to change their attitudes. Their participation in the study and their expression that it is desirable to educate men on maternal health highlight opportunities to promote

male involvement. We recommend urgent programs to mobilize and educate men on their roles in reducing maternal deaths. Messages should address men as partners rather than barriers. Male involvement should not be promoted as a stand-alone intervention but should accompany other interventions, such as poverty alleviation and improvement in emergency obstetric services. The research agenda should include the promotion and support of large-scale controlled cohort studies, triangulated with qualitative methods. Overall, this study lays groundwork for further research and intervention programs to promote involvement of men in the reduction of maternal deaths in Nigeria.

Acknowledgements

The authors are grateful to the study participants, community leaders and all who provided assistance during the study for all their contributions.

References

1. Chipeta EK, Chimwaza W, Kalilani-Phiri L. Contraceptive knowledge, beliefs and attitudes in rural Malawi: misinformation, misbeliefs and misperceptions. *Malawi Med J* 2010; 22:38-41.
2. Green CP, Cohen SI, Belhadj-el Ghouayel H. Male involvement in reproductive health, including family planning and sexual health. New York: UNFPA, 1995.
3. Nzioka C. Research on men and its implications on policy and programme development in reproductive health. In: Programming for male involvement in Reproductive Health. Report of the meeting of WHO Regional Advisors in Reproductive Health. Sept. 5-7, 2001, Washington D.C., USA, 2001.
4. Olawoye JE, Omololu FO, Aderinto Y, Adeyefa I, Adeyemo D, Osotimehin B. Social construction of manhood in Nigeria: implications for male responsibility in reproductive health. *Afr Popul Stud* 2005; 19:1-20.
5. Doedens W, Burns K. Challenges to reproductive health in emergencies. *WHO Health Emergencies News* 2001. URL: <http://www.who.int/hac/about/7099.pdf> Accessed Dec 29, 2012.
6. Gaikwad VS, Murthy TSM, Sudeepa DA. Qualitative study on men's involvement in reproductive health of women among auto-rickshaw drivers in Bangalore Rural. *Online J Health Allied Sci* 2012. URL: <http://www.ojhas.org/issue41/2012-1-3.pdf> Accessed Oct 8, 2012.
7. Greene ME, Mehta M, Pulerwitz J, Wulf D, Bankole A, Singh S. Involving men in reproductive health: contributions to development. Paper prepared for the United Nations Millennium Project. New York: Millennium Development Project. 2006. URL: http://www.unmillenniumproject.org/documents/Greene_et_al-final.pdf Accessed Dec 31, 2012.
8. Agadjanian V. Men's talk about "women's matters": gender, communication, and contraception in urban Mozambique. *Gender & Society* 2002; 16:194-215.
9. Nanjala M, Wamalwa D. Determinants of male partner involvement in promoting deliveries by skilled attendants in Busia, Kenya. *Global J Health Sci* 2012; 4:60-7.
10. Nkuoh G N, Meyer DJ, Tih PM, Nkfusai J. Barriers to men's participation in antenatal and prevention of mother-to-child HIV transmission care in Cameroon, Africa. *J Midwifery Womens Health* 2010; 55:363-9.
11. Adeleye OA, Chiwuzie J. He does his own and walks away: perceptions about male attitudes and practices regarding safe motherhood in Ekiadolor, southern Nigeria. *Afr J Reprod Health* 2007; 11:76-89.
12. Adeleye OA, Aldoory L, Parakoyi DB. Using local culture and gender roles to improve male involvement in maternal health in southern Nigeria. *J Health Commun* 2011; 16:1122-35.
13. Osabor KM, Fatusi AO, Chiwuzie JC. Maternal health-seeking behaviour and associated factors in a rural Nigerian community. *Matern Child Health J* 2006; 10:159-69.
14. Iliyasu Z, Abubakar IS, Galadanci HS, Aliyu MH. Birth preparedness, complication readiness and fathers' participation in maternity care in a northern Nigerian community. *Afr J Reprod Health* 2010; 14:21-32.
15. Odimegwu CO, Adewuyi AA, Odebiyi T, Aina B, Adesina Y, Olatubara O, et al. Men's role in emergency obstetric care in Osun State of Nigeria. *Afr J Reprod Health* 2005; 9:59-71.
16. Association for Reproductive and Family Health. Women's reproductive health, empowerment and male involvement: findings from seven states of Nigeria. Ibadan: Association for Reproductive and Family Health; 1998.
17. Kululanga LI, Sundby J, Chirwa E, Malata A, Maluwa A. Barriers to husbands' involvement in maternal health care in a rural setting in Malawi: a qualitative study. *J Res in Nurs Midwifery* 2012. URL: <http://www.interestjournals.org/JRNM>. Accessed Oct 8, 2012.
18. Kululanga LI, Sundby J, Malata A, Chirwa E. Male involvement in maternity health care in Malawi. *Afr J Reprod Health* 2012; 6:145-57.

19. Carter MW. 'Because He Loves Me': Husbands' involvement in maternal health in Guatemala. *Cult, Health Sex* 2002; 4:259-79.
20. Walston N. Challenges and opportunities for male involvement in reproductive health in Cambodia USAID; 2005. URL: http://www.policyproject.com/pubs/countryreports/MaleInvolv_Cam.pdf Accessed Oct 8, 2012.
21. Thaddeus S, Maine D. Too far to walk: maternal mortality in context. *Soc Sci Med* 1994;38: 1091-110.
22. Prevention of Maternal Mortality Network. About the PMM Network. *Int J Gynecol Obstet* 1997; 59(Suppl. 2):3-6.
23. Maine D. Safe motherhood programs: options and issues. New York: Columbia University, Center for Population and Family Health, 1991.
24. Gummi FB, Hassan M, Shehu D, Audu, L. Community education to encourage use of emergency obstetric services, Kebbi State, Nigeria. *Int J Gynecol Obstet* 1997; 59(Suppl. 2):191-200.
25. Shehu D, Ikeh AT, Kuna MJ. Mobilizing transport for obstetric emergencies in northwestern Nigeria. *Int J Gynecol Obstet* 1997; 59(Suppl. 2):173-80.
26. Association for Reproductive and Family Health. Changes in Women's Reproductive Health and Male Involvement in Nigeria: Post Evaluation: 1996 - 1998. Ibadan: Association for Reproductive and Family Health; 1998.
27. Orisaremi TC, Alubo O. Gender and the reproductive rights of Tarok women in central Nigeria. *Afr J Reprod Health* 2012; 16:83-96.
28. National Centre for Women Development. A compilation of the constitution, national and state statutes and regulations, local government bye-laws, customary laws and religious laws, policies and practices, and court decisions relating to the statuses of women and children, applicable in Nigeria. Abuja: National Centre for Women Development; 2005.
29. Monjok E, Smesny A, Ekabua JE, Essien EJ. Contraceptive practices in Nigeria: literature review and recommendation for future policy decisions. *Open Access J Contracept* 2010. URL: <http://www.dovepress.com/contraceptive-practices-in-nigeria-literature-review-and-recommendatio-peer-reviewed-article-OAJC>. Accessed Mar 30, 2011.
30. Ijadunola MY, AbionaTC, Ijadunola KT, Afolabi OT, Esimai OA, OlaOlorun FM. Male involvement in family planning decision making in Ile-Ife, Osun State, Nigeria. *Afr J Reprod Health* 2010; 14:45-52.
31. Oyediran KA, Ishola GP, Feyisetan BJ. Factors affecting ever-married men's contraceptive use and knowledge in Nigeria. *J Biosoc Sci* 2002; 34:497-510.
32. National Population Commission of Nigeria, ICF Macro. Nigeria Demographic and Health Survey 2013. Abuja: National Population Commission and Calverton, Maryland: ICF Macro, 2014.
33. National Population Commission of Nigeria. National policy on population for sustainable development. Abuja: National Population Commission; 2004.
34. Ibrahim MS, Sufiyan MB, Idris SH, et al. Effect of a behavioral intervention on male involvement in birth preparedness in a rural community in Northern Nigerian. *Ann Nig Med* 2014; 8:20-7.
35. Soubeiga D, Gauvin L, Hatem M, Johri M. Birth preparedness and complication readiness (BPCR) interventions to reduce maternal and neonatal mortality in developing countries: systematic review and meta-analysis. *BMC Pregnancy Childbirth* 2014. URL: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4234142/pdf/1471-2393-14-129.pdf> Accessed Dec 22, 2014.
36. Rosner B. Fundamentals of biostatistics. 3rd ed. Belmont (US): Thompson, 2006, 275.
37. Okpere EE (Ed). Clinical obstetrics. 2nd ed. Benin City, Nigeria: University of Benin Press, 2011.
38. Maine D, Akalin MZ, Ward VM, Kamara A. The design and evaluation of maternal mortality programs. New York: Centre for Population and Family Health, School of Public Health, Columbia University, 1997.
39. World Health Organization. Maternal, newborn, child and adolescent health. URL: http://www.who.int/maternal_child_adolescent/en/ Accessed Jan 4, 2015.
40. Ayuba II, Gani O. Outcome of teenage pregnancy in the Niger Delta of Nigeria. *Ethiop J Health Sci* 2012; 22:45-50.
41. Iklaki CU, Inaku JU, Ekabua JE, Ekanem EI, Udo AE. Perinatal outcome in unbooked teenage pregnancies in the University of Calabar Teaching Hospital, Calabar, Nigeria. *ISRN Obstet Gynecol* 2012. URL: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3316960/pdf/ISRN.OBGYN2012-246983.pdf> Accessed Feb 20, 2012.
42. Braine T. Adolescent pregnancy: a culturally complex issue. *Bull World Health Organ* 2009; 87:410-1.
43. Okpere EE, Okogbenin SA. Age and reproductive outcome. In: Okpere EE (Ed). Clinical obstetrics. 2nd ed. Benin City, Nigeria: University of Benin Press, 2011, 398-402.
44. Mairiga AG, Kullima AA, Bako B, Kolo MA. Sociocultural factors influencing decision-making related to fertility among the Kanuri tribe of north-eastern Nigeria. *Afr J Prim Health Care Fam Med*

2010. URL:
<http://www.phcfm.org/index.php/phcfm/article/download/94/70> Accessed Jun 1, 2010.
45. Khalifa MA. Attitudes of urban Sudanese men towards family planning. *Stud Fam Plann* 1988; 19:236-43.
46. Mbizvo MT, Adamchak DJ. Family planning knowledge, attitudes and practices of men in Zimbabwe. *Stud Fam Plann* 1991; 22:31-8.
47. Ezeh AC, Seroussi M, Raggars H. Men's fertility, contraceptive use and reproductive preference. Demographic and Health Surveys. Comparative Studies No. 18. Calverton, MD: Macro International; 1996.
48. Omo-Aghoja, LO, Omo-Aghoja VW, Aghoja CO, Okonofua FE, Aghedo O, Umeri C, et al. Factors associated with the knowledge, practice and perceptions of contraception in rural southern Nigeria. *Ghana Med J* 2009; 43:115-21.
49. Alemayehu M, Belachew T, Tilahun T. Factors associated with utilization of long acting and permanent contraceptive methods among married women of reproductive age in Mekelle town, Tigray region, north Ethiopia. *BMC Pregnancy Childbirth* 2012. URL: <http://www.biomedcentral.com/1471-2393/12/6>. Accessed Jan 26, 2013.
50. Bhatta DN. Involvement of males in antenatal care, birth preparedness, exclusive breast feeding and immunizations for children in Kathmandu, Nepal. *BMC Pregnancy Childbirth* 2013. URL: <http://www.biomedcentral.com/1471-2393/13/14> Accessed Dec 22, 2014.
51. Adeyemi AB, Aina OI, Eniola OA, Adewuyi AA, Adesina FA. The effect of an educational intervention programme on reproductive health decision-making among couples in south west Nigeria. *Trop J Obstet Gynaecol* 2005; 22:27-32.
52. Miller K, Zulu EM, Watkins SC. Husband-wife survey responses in Malawi. *Stud Fam Plann* 2001; 32:161-74.
53. Cleland JG, Ndugwa RP, Zulu EM. Family planning in sub-Saharan Africa: progress or stagnation? *Bull World Health Organ* 2011; 89:137-43.
54. Bankole A, Sedgh G, Okonofua FE, Imarhiagbe C, Hussain R, Wulf D. Barriers to safe motherhood in Nigeria. New York: Guttmacher Institute, 2009.
55. Kashitala J, Nyambe N, Mwalo S, Musamba J, Chishinga N, Kasonde P, et al. Is male involvement in ANC and PMTCT associated with increased facility-based obstetric delivery in pregnant women? *Afr J Reprod Health* 2015; 19:117-24.

