Impact of video-based supportive-educative nursing intervention on women childbirth experiences and maternity outcomes in Nigeria: a quasi-experimental study.

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ABSTRACT

Introduction: This study evaluated the impact of a video-based supportive-educative nursing intervention on maternity care experiences, childbirth outcomes, and maternal-newborn health in Nigeria to enhance health service delivery.

Methods: This quasi-experimental study, conducted in April 2021 – January 2022, employed a two-stage cluster sampling method to select 282 pregnant women attending public hospitals in southwestern Nigeria. Participants were divided into two groups of 141 women each. Intervention group received an 18-week video-based maternal-newborn education program, while control group received standard maternity care. Data collection employed questionnaires and checklists. Statistical analysis included Chi-square and logistic regression tests with 5% Alpha to assess intervention impact on maternity care experiences, childbirth outcomes, and maternal-newborn health.

Results: Intervention group received more spousal (63.8% vs. 23.5%) and healthcare provider support (98.6% vs. 67.7%); experienced less maltreatment (53.6% vs. 65.2%), significantly increased hospital childbirth rates (OR=0.129, p=0.001). Control group had 48% lower good maternal outcomes (OR=0.526, p=0.013) and 11% less favorable newborn outcomes (OR=0.896, p=0.721), higher maltreatment risk (OR=1.625, p=0.048), reduced spousal support (OR=0.175, p=0.001), and lower healthcare provider support (OR=0.031, p=0.001).

Conclusion: Video-based supportive-educative nursing interventions significantly improved maternity experiences and maternal-newborn health outcomes. Such interventions are crucial for enhancing maternal health o in Nigeria.

Key words: Family, Unions and Households; Sexual and Reproductive Health, Health and Morbidity; Mortality and Longevity

INTRODUCTION

Maternal and infant mortality is a significant global public health issue (1). Recent estimates revealed a significant high number of women still died in the year 2020 from causes related to pregnancy and childbirth and the figure of pregnancy and childbirth related mortality worldwide is in 2020 stood at 287,000 amounting to about 800 women per day (2). The World Health Organization (2) reported that majority of maternal deaths (95%) occur in low and lower-middle income countries and more than half of these deaths occur in sub-Saharan Africa. Africa as a region and Nigeria in particular did not make desirable progress in achieving the Millennium Development Goal (MDG) 5 which specifically advocated for reduction by three quarters the maternal mortality ratio by 2015, universal access to reproductive health (1). Nigeria is ranked second after India in global maternal incident rate and the worst in Africa with nearly 20% of all global maternal deaths happens in Nigeria (1,3).

The current high figures of maternal, newborn and child mortality in Nigeria are associated with complications and illnesses. These could be improved with appropriately enhanced maternity care driven by multiple strategies including the application of cost effective and transformational power of educational video. Use of a video-based health education and information to augment the maternity care of women in Nigeria may help to promote a more sleeveless, collaborative and participatory actions involving expectant families and service providers at the various levels of maternity care settings and particularly people in need of maternity care in hard to reach communities.

High maternal morbidity and mortality in Nigeria are significantly influenced by poor utilization of health service delivery. One major issue is the low proportion of births attended by skilled health personnel, as many women still deliver at home or in settings without skilled health workers, despite free reproductive health services in some public facilities (Ayamolowo et al.). Maternal health care programs in Africa have tried to address financial barriers to accessing services, but non-financial barriers, such as availability, accessibility, acceptability, and quality of care, remain inadequately addressed (5). Removing financial barriers has not significantly increased the acceptance and utilization of maternity services in settings similar to Nigeria (5). Research in

Southwestern and North Central Nigeria shows that free healthcare alone does not ensure universal access to maternal healthcare (5). Poor utilization of these services adversely affects economic development by contributing to high maternal and infant mortality rates, reducing workforce productivity, and increasing healthcare costs (6). Improving maternal and newborn healthcare is crucial for achieving developmental goals that enhance economic development through better health outcomes (6).

Improving childbirth practices requires understanding women's and families' experiences. Beyond financial barriers, socio-cultural factors influencing childbirth location choices are poorly documented. These non-financial factors must be assessed to develop comprehensive interventions that improve childbirth practices and reduce maternal and newborn morbidity and mortality. Poor health service delivery impacts economic development by increasing maternal and infant mortality, reducing workforce productivity, and escalating healthcare costs. Studies in sub-Saharan Africa discuss programs to increase access to maternal and newborn care, yet debates focus on childbirth settings and safety, often prioritizing health professionals' preferences over service end-users' experiences and outcomes (7,8).

Most studies exploring women's maternity experiences in Nigeria are cross-sectional descriptive studies (9-12). Studies have not adequately assessed spousal and health professional support and experiences of maltreatment among women, which can influence future use of maternal and newborn health services (5). While mobile health (mHealth) interventions using text messaging have been documented, their focus is often limited (13,14). Video-based health education, moderated by consumer choices, can engage families and improve maternity care experiences and outcomes. Enhancing maternal health information through videos could promote informed decision-making and positive practices, thereby improving economic development by reducing maternal and infant mortality and increasing workforce productivity. Therefore, this study aimed to examine the impact of video-based health education and information intervention in maternity care to improve families' maternity care experience and outcomes. These findings could inform the design of programs for positive maternal and newborn health outcomes in low-resource, underserved settings in Nigeria.

Materials and Methods

This quasi-experimental study was conducted on 282 pregnant women in their second trimester, each with at least one previous pregnancy and childbirth, in a southwestern state in Nigeria from April 2021 to January 2022. The sample size was determined using the formula for comparing proportions with a prevalence of hospital childbirth of 60.5% (15). An adjusted sample size, allowing for a 10% attrition rate, resulted in 141 women per study group. The study employed a two-stage cluster sampling method. Two rural communities were randomly selected from each of the six LGAs in two senatorial districts in the study area. The criteria for selecting and categorizing these communities were based on similarities in rural features. A house-to-house survey was conducted in the 12 selected communities to recruit pregnant women. Selection criteria included being in the second trimester, having at least one previous pregnancy and childbirth, owning a DVD player, and having a family member with a mobile phone. For households with more than one eligible woman, a lottery method was used to select the participant. If a household had no eligible woman, the immediate next household was visited. Revisits were made up to two times if eligible respondents were not available at the time of the survey. Participants were randomly assigned to intervention and control groups. Women without previous pregnancy experience and households without a DVD player or mobile phone were excluded.

Two instruments were used for data collection: a semi-structured interviewer-administered questionnaire and an intervention outcome checklist. The questionnaire, administered at the first contact and six weeks post-childbirth, included sections on demographic characteristics and obstetric information such as gender, age, marital status, and parity. The Carver Sources of Social Support Scale (SSSS) was adapted to assess the perceived maternity care experience regarding physical and social support available to women (16). The SSSS contains ten items rated on a 5-point Likert scale (1 = Not at all; 2 = A little; 3 = A moderate amount; 4 = A pretty large amount; 5 = A lot). Scores ranged from 0 to 100 points, with >50 categorized as strong support and <50 as

weak support. This validated scale has been previously used in longitudinal studies of cancer patients and is relevant to the stressful state of pregnancy and childbirth (16).

Experience of maltreatment and abuse was measured using a 25-item scale, with items scored dichotomously as ‘yes’ (1) or ‘no’ (0). Mean scores on experience of maltreatment and abuse were computed to categorize responses. These questions were developed from literature on childbirth experiences, covering multidimensional aspects that comprehensively assessed women's perceptions of and feelings about their antenatal care and childbirth. An intervention package was developed, including a maternal and newborn health information and education video on DVD for use in both home and hospital settings. The video contained pre-recorded real-time and animated educational sessions covering antenatal, intranatal, and postnatal care, sourced from Medical Aid Film and the HeathPhone project of MCHET (17,18). The videos, available in English and Yoruba, provided practical guidance on a wide range of maternity healthcare situations commonly experienced in low-resource settings. Families in the intervention group received the video at the beginning of the second trimester and were encouraged to watch it as needed. Real-time voice calls and weekly reminders were provided over 18 weeks.

The evaluation checklist recorded outcomes such as choice of place of childbirth, number of antenatal care (ANC) visits, and maternal/newborn morbidity and mortality. Newborn outcomes specifically included live birth/stillbirth, birth weight, gestational age, major malformations, and NICU admissions. These outcomes were measured six weeks post-childbirth, with both women and their spouses participating in filling out the measured outcomes to ensure data accuracy. Data analysis was conducted using SPSS version 23. Statistical methods employed included Chi-square tests to examine associations between categorical variables and logistic regression to assess the impact of the intervention on maternity care experiences, childbirth outcomes, and maternal-newborn health. A significance level of $\alpha = 0.05$ was used to determine statistical significance in all analyses. The study received approval from the Research and Ethics Committee of Ekiti State University Teaching Hospital, Ado-Ekiti, Nigeria (Protocol number: EKSUTH/A67/2016/05/006). Permission to conduct the study was sought from local community heads, and informed consent was obtained from all participants. Counselling was available as needed for mothers and their families during the study.

Results

Socio-demographic characteristics of respondents

The average age in the intervention group was 28.1 years (SD = 5.1), while in the control group, it was 29.7 years (SD = 6.5). The majority of participants in both groups were aged 25-34 years. In terms of marital status, 96% of the intervention group and 91% of the control group were married. Most participants in both groups lived in monogamous families (80% in the intervention group and 83% in the control group) and were Christians (76% in the intervention group and 79% in the control group). Educationally, 39% of the intervention group had tertiary education, compared to 42% in the control group, and spousal education was high in both groups, with 57% and 56% having tertiary education in the intervention and control groups, respectively. The income level showed that 57% of the intervention group and 64% of the control group had a monthly family income of 15,000 Naira and above. Most respondents in both groups had their first pregnancy before age 29, with mean ages at first pregnancy being 22.1 years (SD = 3.9) for the intervention group and 22.9 years (SD = 4.4) for the control group. The majority of participants had four or more antenatal care visits (90% in the intervention group and 86% in the control group) (Table 1).

Respondents' maternity experiences

Maternity experiences varied significantly between the groups. A higher percentage of the intervention group had medical professionals (93% doctors, 98% nurses/midwives) at their last childbirth compared to the control group (88% doctors, 66% nurses/midwives). Notably, 93% of the intervention group who delivered in hospitals reported no mistreatment, compared to 49% in the control group. Physical and verbal abuse, as well as other negative experiences such as stigma, lack of supportive care, non-consented physical examinations, and neglect, were significantly lower in the intervention group. Additionally, 89% of the intervention group reported strong spousal support during antenatal care, compared to 50% in the control group, and 92% reported strong caregiver support compared to 54% in the control group (Table 2).

Effects of video-based health education intervention on key maternal and newborn outcomes

The intervention significantly impacted key maternal and newborn outcomes. Mothers in the intervention group were significantly more likely to deliver in a hospital (91% vs. 58% in the control group; OR = 0.13, $p < 0.05$). The intervention group also had significantly better outcomes regarding live births, stillbirths, low birth weight, small for gestational age, NICU admissions, and major newborn malformations. Specifically, the control group had higher odds of stillbirths (OR = 5.39, $p < 0.05$), low birth weight (OR = 3.51, $p < 0.05$), small for gestational age (OR = 4.23, $p < 0.05$), NICU admissions (OR = 2.83, $p < 0.05$), and major newborn malformations (OR = 3.99, $p < 0.05$) compared to the intervention group (Table 3). For maternal outcomes, the intervention group had significantly better outcomes overall (OR = 0.53, $p < 0.05$). While the likelihood of attending four or more antenatal visits and delivering at a hospital was higher in the intervention group, these differences were not statistically significant (Table 3).

Effects on Maternity Experience

The intervention significantly improved maternity experiences. The control group had higher odds of mistreatment (OR = 1.63, $p < 0.05$) and significantly reduced odds of receiving spousal (OR = 0.18, $p < 0.05$) and caregiver support (OR = 0.03, $p < 0.05$) compared to the intervention group (Table 4).

Discussion

The current study reveals significant improvements in maternal and newborn outcomes and maternity experiences among participants exposed to an Information and Communication Technology (ICT)-based intervention. The intervention group benefited from increased spousal and healthcare provider support, resulting in a higher rate of hospital childbirths compared to the control group. The study's limited sample size may affect the generalizability of its findings. The reliance on self-reported data from women can introduce potential biases, affecting accuracy. Furthermore, technological barriers, such as lack of access to digital devices, limit the intervention's effectiveness and inclusivity. However, the strengths of this study include its innovative use of ICT for supportive-educative nursing interventions, which significantly enhance maternal and newborn health outcomes, marking a pivotal advancement in leveraging technology in healthcare. Comprehensive assessment across various dimensions of maternity care provides a holistic evaluation of the intervention's impact. Additionally, the study's emphasis on respectful

maternity care aligns with global health priorities, promoting human rights standards in maternal care.

Pregnancy and childbirth can be highly stressful experiences for women and families, with varying degrees of discomfort influenced by educational status, ethnicity, social and financial backgrounds, and access to healthcare services (19). However, women should have the opportunity for a positive maternity experience regardless of these factors (20). Optimal childbirth experiences increase satisfaction, promote mental health, and encourage future childbirth in the same location (21). Conversely, negative experiences can deter future choices of care locations (22). Understanding women's preferences and needs is crucial for developing maternity care models that prioritize these needs over the healthcare system's or professionals' perceptions (23).

This study assessed antenatal and childbirth care, spousal and caregiver support, and experiences of maltreatment and abuse. Maltreatment in maternity care was defined as interactions or conditions perceived as humiliating or undignified (24). Freedman's definition captures both individual disrespect (e.g., slapping or scolding) and structural issues (e.g., overcrowded, understaffed wards) (24). Most study participants received skilled antenatal care and attended more than four antenatal visits, contrary to the findings of Tariku et al. (25), where the majority did not complete their ANC follow-up.

Spousal and caregiver support in pregnancy and childbirth was also assessed. Findings revealed that the majority of study participants in the intervention group had strong spousal and caregiver support during maternity care and chose hospitals for childbirth, while only about half of the control group reported strong support. Support was generally better among women who utilized hospitals compared to those who opted for home maternity care. The deprivation of health caregivers' support for home childbirth women will worsen the maternity experience for those opting for services outside hospital settings. Pregnancy and childbirth should be supported and made safe in all maternity care settings. Innovative maternity care aiming for positive maternal and newborn outcomes needs to promote choices, respect women's fundamental right to access healthcare, and focus on harnessing public support to improve maternal and newborn morbidity and mortality indices (25).

The experience of maltreatment and abuse during maternity care was also assessed. The majority of the intervention group, who chose hospital childbirth, did not experience maltreatment and abuse, compared to less than half in the control group. Most participants in the intervention group who delivered in the hospital did not experience physical abuse, stigma, or discrimination, received supportive care, and were not victims of inappropriate demands. One major aim of the intervention was to build families' capacity to engage with care providers and negotiate their maternity care processes cooperatively. This likely explains the positive findings regarding abuse and maltreatment experiences among the intervention group participants (24).

Respectful maternity care has recently gained global attention. Seven categories of mistreatment and abuse have been developed for respectful maternity care (26). Okafor et al. (27) reported non-consented services and physical abuse as the most common types of disrespectful and abusive care during facility-based childbirth in South-eastern Nigeria. Other forms of disrespectful and abusive care include non-dignified care, abandonment/neglect during childbirth, non-confidential care, detention in the health facility, and discrimination (27, 28). Bohren et al. (28) organized mistreatment into six forms of violence under two dimensions: intentional use of violence and deviations from accepted standards of care. Mehata et al. (29) found that women treated with respect, courtesy, and dignity, and who have trusting relationships with their care providers, are more likely to be satisfied with maternity care.

Freedman et al. (24) highlighted a dilemma in defining disrespect and abuse solely as deviations from the right to health. If all substandard facility-based childbirth is deemed disrespectful and abusive, prevalence could be 100%. The author argued for a definition based on actual experiences of violations from both victim and perpetrator perspectives, especially where such disrespect and abuse are normalized within the health system. Jewkes and Penn-Kekana (30) view mistreatment of women in childbirth as a subset of violence against women and advocate for policies and interventions to prevent such mistreatment. These policies can address the lack of repercussions for unacceptable behaviour by maternity care providers, who may feel entitled, viewing themselves as helping rather than providing professional services.

Safe childbirth is crucial in choosing a maternity care place. Childbirth affects both the mother and newborn significantly. Clean and safe care during childbirth is vital for maternal and newborn

outcomes. The period with the highest risk of death and disability for both mothers and newborns is labor, birth, and the first few hours after birth (31, 32). Over three-quarters of all maternal deaths in developing countries occur during or soon after childbirth (2). Maternity care providers must deliver their services professionally and with utmost care. Mothers should be guided and well-informed about their choice of birthplace to ensure zero mortality rates from poor maternity care delivery.

Specific newborn outcomes measured in this study include live birth, stillbirth, low birth weight, small for gestational age, preterm childbirth, admission to the neonatal intensive care unit (NICU), and newborn malformation. Maternal outcomes measured include the number of ANC visits, the actual place of antenatal care, and maternal mortality (mother alive after 24 hours of childbirth). In all measured outcomes, the majority of respondents in both the intervention and control groups who chose a hospital for childbirth had better maternal and newborn outcomes compared to those who chose home maternity care. This finding contradicts Scarf et al. (33), who found no statistically significant impact of birthplace on maternal and infant outcomes. The only maternal mortality in this study occurred in the home childbirth setting in the control group. The poor maternal and newborn outcomes among home childbirth participants align with reports linking unskilled birth attendants to detrimental health outcomes, complications, and maternal or neonatal death (34). The proportion of births attended by skilled health personnel consistently correlates with better outcomes, emphasizing it as a crucial measure for good maternal and newborn outcomes worldwide (35). Information and Communication Technology use for supporting maternity care and specifically the use of video-based supportive-educative nursing intervention for maternal and newborn care can enhance information acquisition and behavioural change for reproductive health practices. Use of video-based supportive-educative nursing intervention in this study assisted with getting timely information and education to families when and where they needed them during pregnancy, childbirth and immediate post-natal period. Consumers with enhanced capacity are reportedly better able to manage their health and mediate their doctor–patient relationships and take charge of their health care (36,37). The study findings highlight the potential of ICT interventions to positively impact healthcare delivery and contribute to economic development by reducing healthcare costs associated with maternal and newborn complications

Conclusion

Video-based nursing interventions significantly enhance maternity experiences and maternal-newborn health outcomes, crucial for improving service delivery and driving economic development in Nigeria. Providers must deliver services professionally, leveraging ICT for effective care interactions, aligning with Sustainable Development Goals by 2030. Integrating health informatics and eHealth improves care access, enhancing service delivery nationwide. Empowering families with healthcare knowledge and technology supports positive health outcomes and economic growth. Investments in ICT for maternal and newborn health promise healthier populations and prosperity in Nigeria and similar contexts

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Conflict of interest

There are no conflicts of interest. The funding source play no role in study design; in collection, analysis and interpretation of data; in the writing of the report; and in the decision to submit the article for publication.

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Table 1: Demographic characteristics of participants in the intervention and control group

Variable	Intervention group (n= 140) %(n)	Control group (n= 138) % (n)
Age group (Mean: *T=28.1±5.1; *C=29.7±6.5**)**		
15 – 24	22.9 (32)	19.3(26)
25 – 34	65.0(91)	59.3(80)
≥35	12.1(17)	21.5(29)
Marital status		
Married	95.7(134)	91.3(126)
Single	4.3(6)	8.7(12)
Type of Family		
Monogamy	80.0(112)	83.3(115)
Polygamy	20.0(28)	16.7(23)
Religion		
Christianity	76.4(107)	79.0(109)
Others	23.6(33)	21.0(29)
Ethnicity		
Yoruba	80.7(113)	78.3(108)
Igbo	10.7(15)	10.9(15)
Others	8.6(12)	10.9(15)
Occupation		
Civil servant	20.7(29)	23.2(32)
Trading	35.0(49)	31.2(43)
Artisan	30.0(42)	15.9(22)
Unemployed	14.3(20)	29.7(41)
Highest qualification attained		
Non or Primary	23.6(33)	20.3(28)
Secondary school completed	38.6(54)	37.7(52)
Tertiary	37.9(53)	42.0 (58)
Husband educational status		
Non or Primary	11.4(16)	23.9(33)
Secondary school completed	31.4(44)	20.3(28)
Tertiary	57.1(80)	55.8(77)
Family income per month (in Naira)		
< 5000	17.1(24)	8.7(12)
5,000 – 9,999	21.4(30)	18.1(25)
10,000 - 14,999	4.3(6)	9.4(13)
15,000 and above	57.1(80)	63.8(88)
Age at first Pregnancy (Mean: (T=22.1; SD:3.9) (C=22.9; SD:4.4)**)**		
< 29	95.7(133)	90.8(119)
30+	4.3(6)	9.2(12)

Age at last Pregnancy (Mean: *T=28.4±5.1; *C=29.7±6.6		
< 29	59.0(82)	51.6(66)
30+	41.0(57)	48.4(62)
Total Number of Pregnancy		
1-2	43.2(60)	36.6(48)
3-4	42.4(59)	49.6(65)
5+	14.4(20)	13.7(18)
Total Number of Children		
1-2	61.2(85)	60.8(79)
3-4	29.5(41)	33.8(44)
5+	9.4(13)	5.4(7)
Number of ANC for last pregnancy		
<4	9.8(13)	14.0(17)
4+	90.2(119)	86.0(104)

***T = Treatment group; C = Control group**

Table 2: Comparison of maternity experience in intervention group and control group

Post Intervention Characteristics	Intervention group (140)		Control group (138)	
	Home %(f)	Hospital %(f)	Home %(f)	Hospital %(f)
Attendant of childbirth				
Traditional birth attendants	45.5(5)	54.5(6)	87.5(21)	12.5(3)
My mother	0(.00)	100.0(2)	100.0(1)	0(.00)
Mother- in- law	0(.00)	100.0(2)	83.3(5)	16.7(1)
Medical doctor	6.7(2)	93.3(28)	12.5(3)	87.5(21)
Nurses/midwives	1.7(1)	98.3(56)	33.9(20)	66.1(39)
Community health extension worker (CHEW)	0.0(0)	100(21)	18.2(2)	81.8(9)
Others	80.0(4)	20(1)	0(.00)	0(.00)
Experience of mistreatment				
Yes	12.5(4)	87.5(28)	35.4(28)	64.6(51)
No	7.4(8)	92.6(100)	50.8(30)	49.2(29)
Physical abuse				
Yes	8.3(3)	91.7(33)	37.5(27)	62.5(45)
No	8.6(9)	91.4(95)	47.0(31)	53.0(35)
Sexual abuse				
Yes	0.0(0)	100.0(2)	20.0(1)	80.0(4)
No	8.7(12)	91.3(126)	42.9(57)	57.1(76)
Verbal abuse				
Yes	8.3(1)	91.7(11)	32.4(24)	67.6(50)
No	8.6(11)	91.4(117)	53.1(34)	46.9(30)
Stigma and discrimination				
Yes	0.0(0)	100.0(1)	0.0(0)	100.0(6)
No	8.6(12)	91.4(127)	43.9(58)	56.1(74)
Lack of confidentiality				
Yes	11.1(2)	88.9(16)	17.9(5)	82.1(23)
No	8.2(10)	91.8(112)	48.2(53)	51.8(57)
Non-consented physical examination				
Yes	0.0(0)	100.0(17)	3.8(1)	96.2(25)
No	9.8(12)	90.2(111)	50.9(57)	49.1(55)
Neglect and abandonment				
Yes	0.0(0)	100.0(18)	22.1(15)	77.9(53)
No	9.8(12)	90.2(110)	61.4(43)	38.6(27)
Lack of supportive care				
Yes	0.0(0)	100.0(6)	8.7(2)	91.3(21)
No	9.0(12)	91.0(122)	48.7(56)	51.3(59)
Autonomy loss				
Yes	3.7(1)	96.3(26)	4.2(1)	95.8(23)
No	9.7(11)	90.3(102)	50.0(57)	50.0(57)

Post Intervention Characteristics	Intervention group (140)		Control group (138)	
	Home %(f)	Hospital %(f)	Home %(f)	Hospital %(f)
Lack of resources				
Yes	0.0(0)	100.0(7)	0.0(0)	100.0(3)
No	9.0(12)	91.0(121)	43.0(58)	57.0(77)
Lack of privacy				
Yes	4.3(1)	95.7(22)	28.7(21)	71.2(52)
No	9.4(11)	90.6(106)	56.9(37)	43.1(28)
Facility culture (illegal demand for money)				
Yes	0.0(0)	100.0(5)	25.0(1)	75.0(3)
No	8.9(12)	91.1(123)	42.5(57)	57.5(77)
Husband's support during maternity care				
Weak	2.0(1)	98.0(49)	39.4(41)	60.6(63)
Strong	11.4(10)	88.6(78)	50(16)	50(16)
Care giver's support in maternity care				
Weak	0.0(0)	100.0(2)	34.1(15)	65.9(29)
Strong	8.1(11)	91.9(125)	45.7(42)	54.3(50)

Table 3: Logistic regression analysis of effect of intervention on key outcomes

Outcomes	Pre-intervention		Post-intervention		Post-intervention Effect			
	Intervention	Control	*Intervention	Control	% diff.	χ^2 /df	OR(95% CI)	p-value
Child outcomes								
Life birth								
Yes	95.0(134)	93.6(132)	98.6(138)	93.5(129)	5.1%	0.03(1)	0.21(0.04-0.98)	0.047
Still Birth								
Yes	5.0(7)	6.4(9)	1.4(2)	7.2(10)	5.8%	5.69(1)	5.39(1.16-5.11)	0.032
Foetal distress								
Yes	22.0(31)	25.5(36)	8.6(12)	12.3(17)	3.7%	1.00(1)	1.49(0.68-3.24)	0.319
Low birth weight								
Yes	19.1(27)	13.5(19)	4.3(6)	13.8(19)	9.5%	7.43(1)	3.51(1.36-9.09)	0.010
Small for gestational age								
Yes	14.9(21)	14.2(20)	3.1(4)	11.9(16)	8.8%	7.31(1)	4.23(1.38-13.03)	0.012
Preterm childbirth								
Yes	18.4(26)	15.6(22)	7.0(9)	13.2(18)	6.2%	2.83(1)	2.03(0.88-4.71)	0.097
Admission to NICU								
Yes	6.4(9)	9.2(13)	5.0(7)	13.0(18)	8.0%	5.41(1)	2.83(1.14-7.01)	0.025
Major newborn malformation								
Yes	4.3(6)	1.4(2)	2.2(3)	8.1(11)	5.9%	5.00(1)	3.99(1.09-14.6)	0.037
Overall child outcome								
*Good	57.9(81)	58.6(82)	80.2(101)	78.4(105)	1.8%	0.13(1)	0.89(0.49-1.63)	0.721
Poor	42.1(59)	41.4(58)	19.8(25)	21.6(29)				
Maternal outcomes								
Number of ANC								
*4+	74.2(95)	70.8(85)	90.2(119)	86.0(104)	4.2%	0.35(1)	0.67(0.31-1.44)	0.304
<4	25.8(33)	29.2(35)	9.8(13)	14.0(17)				
Place of ANC								
*Hospital	38.3(54)	36.9(52)	74.3(104)	68.1(94)	6.2%	1.29(1)	0.74(0.44-1.24	0.257
Home	61.7(87)	63.1(89)	25.7(36)	31.9(44)				
Place of childbirth								
*Hospital	39(55)	46.8(66)	91.4(124)	58.0(80)	33.4%	41.2(1)	0.13(0.06-0.26)	0.000
Home	61.0(86)	53.2(75)	8.6(12)	42.0(58)				
Overall maternal outcome								
***Good**	16.4(21)	14.2(17)	65.9(87)	50.4(61)	15.5%	0.01(1)	0.53(0.32-0.87)	0.013
Poor	83.6(107)	85.8(103)	34.1(45)	49.6(60)				

*Reference for odd ratio; ** P-value significant at <5% significant level

Table 4: Logistic Regression of Pre- and Post-Intervention Effects on Childbirth Experiences

Groups	**Pre Intervention**		**Post Intervention**		**% difference**	χ^2 **(df)**	**p-value**	**OR (95% CI)**
	Maltreatment							
	No	**Yes**	**No**	**Yes**				
*Intervention	32.2(45)	67.8(96)	46.4(65)	53.6(75)	11.6%			
Control	35.7(50)	64.3(91)	34.8(48)	65.2(90)		3.907 (1)	0.048	1.625(1.00-2.63)
	Spousal support							
	Weak	***Strong**	**Weak**	***Strong**				
Intervention	48.9(69)	51.0(72)	36.2(50)	63.8(88)	40.3%			
Control	53.9(76)	46.1(65)	76.5(104)	23.5(32)		45.06 (1)	0.000	0.175**(0.10-0.29)
	Caregiver support							
	Weak	***Strong**	**Weak**	***Strong**				
Intervention	66.0(93)	34.0(48)	1.4(2)	98.6(136)	30.9%			
Control	68.8(97)	31.2(44)	32.3(44)	67.7(92)		46.82 (1)	0.000	0.031**(0.01-0.13)

*Reference for odd ratio; ** P-value significant at <5% significant level