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A COMPARATIVE STUDY OF BIRTH PREPAREDNESS AND COMPLICATION READINESS AMONG WOMEN ATTENDING PRENATAL CLINIC IN GEM SUB COUNTY, KENYA

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Abstract

Purpose: To compare the levels of birth preparedness and complication readiness among women receiving group versus those receiving individual prenatal care.

Methodology: A quasi-experimental study that utilized the pre-test/post-test design with random assignment to either group or individual care. The recruitment of respondents was done over a period of six weeks. The sample size was determined using Pocock's formulae. During recruitment, 175 respondents were enrolled in the study. 59 respondents were recruited at Malanga, 48 at Nyawara, 35 at Ndere and 33 at Marenyo. This distribution was based on population targets assigned by the Sub-County Health Team and facility performance data retrieved from DHIS. ($n = 175$). Demographic data were analyzed using descriptive statistics. Bivariate analysis was used to determine and control for any confounders. Differences between control and intervention arms were determined using chi-square and independent samples t-tests. $P < 0.05$ was considered significant.

Findings: The mean age for both arms was 24.1 years. In the intervention arm, 16% were not married while 84% were married while in the control group 15% and 85% were not married and married respectively. Level of education was matched with those having primary level education being more than half (53%) while those with secondary level education and tertiary level education were 40% and 7% respectively. A total of 32 respondents in the intervention group attended the second prenatal care visit at Malanga, 22 at Nyawara, 12 at Ndere and 15 at Marenyo. During the third visit, 28, 23, 13 and 13 respondents attended group sessions at Malanga, Nyawara, Ndere and Marenyo. Birth preparedness and complication readiness was 17% during pre-test. There was no significant difference in birth preparedness and complication readiness in the intervention and control group ($p > 0.05$). Regarding any form of preparation made, the majority of the clients (91% and 89%) in the intervention and control groups respectively had made some form of preparation. With regards to the identification of a skilled birth attendant, 88% in the intervention and 94% in control had identified a skilled birth attendant.

Unique Contributions to Theory, Practice and Policy: The study recommends that standards and guidelines for group prenatal care be developed to enable its implementation in prenatal care

Keywords: ANC, skilled delivery, Complication readiness, Birth preparedness, quasi-experimental.

BACKGROUND

The high levels of maternal mortality and morbidity were recognized globally as a neglected problem (JHPIEGO, 2004). The safe motherhood initiative was subsequently launched in 1987 in Nairobi to raise awareness about the extent of poor maternal health and to mobilize actions to address it (JHPIEGO, 2004). Birth preparedness and complication readiness were subsequently launched by WHO as a strategy to promote the timely use of skilled maternal and neonatal care. This is because every pregnant woman faces a sudden risk of unpredictable life-threatening complications that could lead to death (Marko & Bogale, 2014). Timely access to skilled care during pregnancy, childbirth and postpartum period can be hampered by three levels of delays. Thaddeus and Maine (1994) identified three levels of delays that have many causes including finances, logistical challenges and gaps in service delivery. The first level of delay is the delay in seeking care which may be caused by failure to recognize signs of complications, failure to perceive the seriousness of the complications and cost considerations (JHPIEGO, 2004). The second level of delay is that of reaching a health facility which may be caused by long distance from the health facility, poor road conditions or absence of emergency transport (JHPIEGO, 2004). The third level of delay is that of receiving care that may result from the attitude of the health care providers, shortage of basic supplies or poor skills on the part of the health care providers (JHPIEGO, 2004).

The concept of group prenatal care was first introduced by Sharon Rising in the United States where she envisioned a new model of care that was client-centered and designed to empower the pregnant woman and her support persons (Reid, 2007). Group prenatal care is a relationship model of care since it takes healthcare outside the examination room thus eliminating the barriers between the healthcare providers and the women (Massey et al., 2006). According to Rising et al., (2004), individual prenatal care is dispensed with and replaced with 2-hour prenatal care sessions comprising 8-12 women who share a similar expected month of delivery. Sessions begin at 12-16 weeks and women within the group learn self-care skills such as taking their blood pressure and weight and undergo a physical assessment by the care provider before proceeding to the group to discuss the issues around the content of pregnancy, childbirth and parenting (Rising et al., 2004).

According to Massey et al., (2006), the following areas for education were identified for the group sessions; nutrition, exercise, relaxation techniques, pregnancy problems, infant care, and feeding, postpartum issues including contraception, communication and self-esteem, comfort measures in pregnancy, parenting and childbirth preparation.

LITERATURE REVIEW

Several studies have evaluated birth preparedness and complication readiness. Ickovics et al., (2007) conducted a randomized control trial in Connecticut and Atlanta to determine if group prenatal care improved pregnancy outcomes, psychosocial functions, and patient satisfaction. The study utilized a sample of 1,047 women and found out that women enrolled in group care felt more ready for labor and delivery ($p < 0.001$). Mullany et al. (2007) conducted a randomized control trial to evaluate the impact of including husbands in prenatal health education in Nepal. This was a three-arm randomized control trial in which there were a control group and two intervention groups which included women in groups alone and women in groups together with their partners. The study found out that women who were enrolled for group sessions were twice as likely as those in the control group to report making more than three birth preparations (RR=1.99, 95% CI: 1.10,3.59). In addition, the study also found out that there was no difference in birth preparedness among women who attended care in groups without their husbands and those who attended care in groups together with their husbands.

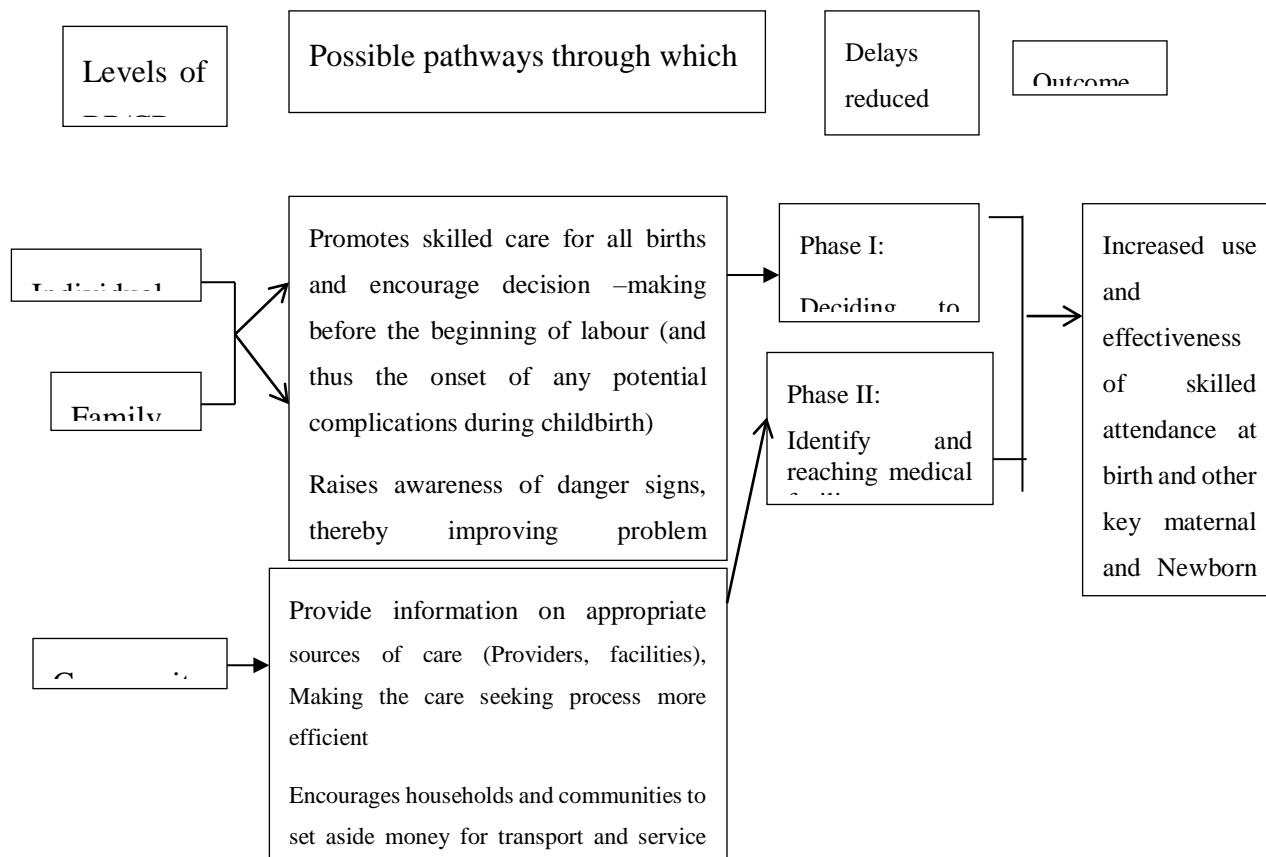
Kumar et al., (2008) conducted a cluster randomized control trial in Bangladesh on the effect of community-based behavior change management on neonatal mortality. This study was a three-arm randomized controlled trial in which one intervention group received a package of essential newborn care which included birth preparedness while the second intervention group received the package for essential newborn care in addition to liquid crystal hypothermia indicator. Using the intention to treat analysis, the study found out that there were significant differences between the control and the two intervention groups. Women in the first intervention group were three times more likely to have identified a health facility for delivery (RR= 3.43 95% CI=2.12,5.54, $p < 0.0001$) while those in the second intervention group were also three times more likely to identify a health facility (2.99, 95% CI =1.97,4.63, $p < 0.005$). There were however no significant

differences with regards to savings between the two intervention groups and the control ($P=0.009$ and $p=0.007$ respectively). A systematic review has also been conducted to review birth preparedness and complication readiness interventions. In a systematic review and meta-analysis of birth preparedness and complication readiness interventions, Subeiga et al. (2014) documented that two trials showed improvements in birth preparedness and complication readiness.

In India, a cross-sectional Observational study on the status of birth preparedness and complication readiness was carried out by Saha et al. (2014) among rural women. In the study, the level of birth preparedness was found to be 62.8%. Besides, the study found out that less than half of the women (35.7%) had saved money and more than half of the respondents (60%) had prepared a mode of transport in case of an emergency. In a similar study by Aggarwal et al. (2010) among slum women in an Indian city, it was found that close to half of the respondents (47.8%) were prepared for birth and ready for complications. In addition, the researchers found that majority of the women (69.6%) had identified a skilled birth attendant, more than half (63.8%) had identified a health facility, less than one third (29.5%) had arranged for transport while more than three quarters (76.9%) had saved money.

Even though birth preparedness and complication readiness has been identified as a simple and cost-effective strategy for reducing maternal and neonatal mortality and morbidity, it has not been utilized effectively due to cultural beliefs and lack of awareness (Markos & Bogale, 2014). The result is that most families do not know how to recognize danger signs and when complications occur, the unprepared family wastes a lot of time in recognition of the problem, getting organized, finding transport and reaching the health facility (Markos & Bogale, 2014). This study aims to gain insight into birth preparedness and complication readiness as a means of reducing childbirth-related complications among women receiving group and individual prenatal care.

2.1 CONCEPTUAL FRAMEWORK OF BIRTH PREPAREDNESS AND COMPLICATION READINESS



Individual Level Preparedness

Individual level preparedness involves the woman being knowledgeable about the possible danger signs that could occur during pregnancy, labor and postpartum period. It also involves the women being able to set aside funds to be used in case of an emergency, preparing transport in advance as well as identifying a health facility for delivery or an emergency. This helps in reducing the delay in deciding to seek care as well as delay in reaching the health facility.

Family Level Preparedness

Birth preparedness and complication readiness provides information on appropriate sources where the client can seek care as well as encouraging households and communities to make transport and

financial arrangements and service fees if any. Such advanced arrangements enable the woman and her family to get to the health facility in time and this reduces the second delay.

METHODS

The study was conducted in Gem Sub-county, Siaya County in Western Kenya, and approval to conduct the study was obtained from the Institutional Research and Ethics Committee of Moi University and MTRH. No further approval was needed since the project did not require access to patients or personal data.

Research Design

This was a quasi-experimental study that utilized the pre-test/post-test design. In this design, baseline data were collected on the level of birth preparedness and complication readiness in both the control and the interventional facilities and analyzed. Post-test data was then collected after the intervention and analyzed. All the four health facilities had both intervention and control groups

Study setting and Participants

The study involved pregnant women prenatal care clinic at Malanga, Ndere, Nyawara, and Marenyo Health Centers in Gem Sub-County. Women coming for the first prenatal care visit with no complications were included while women with medical and psychiatric conditions requiring individualized assessment and those below 18 years were excluded. During the first visit, trained research assistants who were nurse-midwives explained the choice of either individual or group care and briefly introduced the study. Women were randomly assigned to either group or individual care using a table of random numbers. Simple random sampling was employed. Cards with a series of numbers from 1 to 162 were made and each card was assigned either control or intervention as determined by the random numbers. When the first patient came, the first envelope was opened and the patient assigned to either control or intervention. The process was repeated until the desired sample size was achieved. The control group consisted of women attending individual prenatal care while the intervention consisted of women attending prenatal care in groups. Those enrolled in the intervention group were assigned into groups based on their expected month of delivery. The recruitment of respondents was done over a period of six weeks. The

sample size was determined using Pocock's formulae. During recruitment, 175 respondents were enrolled in the study. Fifty-nine respondents were recruited at Malanga, 48 at Marenyo, 35 at Ndere and 33 at Marenyo. This distribution was based on population targets assigned by the Sub-County Health Team and facility performance data retrieved from DHIS.

Procedure

Baseline data on birth preparedness and complication readiness were collected among women who had attended at least one prenatal care visit in all the four health facilities using a sample size of 81 women. A woman was considered prepared for birth and ready for complications if she had identified a skilled birth attendant, had set aside funds and made transport arrangements. Data were collected using a modified structured questionnaire developed by JHPIEGO. Participants were recruited during their first prenatal care visit. They were informed of the purpose of the study and those who gave consent were included for the study. The participant's telephone contacts and physical addresses were documented to assist in reminding them of their care appointment dates.

Respondents enrolled in both arms of the study went through 4 care sessions. A total of 79 completed the study with Malanga having 24, Nyawara having 22, Ndere had 19 and Marenyo had 18. Respondents in the group prenatal care session went through 3 group care sessions. The second group prenatal care session was held four weeks after the first visit; the third group care session was held five weeks after the third while the fourth group care session was held four weeks after the third visit. A total of eight prenatal groups were constituted with Malanga Health Centre having three groups, Nyawara and Marenyo having two groups each while Ndere had one group.

During each group care session, women had their weight and blood pressure readings taken and had a physical examination done and those who had personal problems related to pregnancy were attended to. The women were then issued with IPT, received TT injection, and received iron and folic acid supplements, ITN and deworming tablets as necessary and the next appointment dates given before proceeding to the group. Women were assigned to groups of 8-12 individuals and the group sessions focused on issues relating to pregnancy, childbirth, and parenting and those provided the women an opportunity to benefit from the support component of prenatal care (Rising, et al., 2004).

Group care sessions were facilitated by trained research assistants who were nurse-midwives. The group care sessions involved women sharing and talking about their experiences during pregnancy. Group care enabled women to take responsibility for themselves as it takes care out of the examining room usually controlled by the care provider. Among the intervention, Malanga health center had a total of 30 respondents (3 groups), Nyawara had 22 (2 groups), Ndere had 12 (1 group) while Nyawara had 15 (2 groups). The topics discussed in the group included nutrition, exercise, relaxation techniques, pregnancy problems and comfort measures, infant care and feeding, communication, self-esteem and childbirth preparation (Masey et al., 2006). In addition, the specific components on birth preparedness and complication readiness were also included during each visit and that included knowledge of key danger signs as well as making specific arrangements for delivery of the baby. Data on birth preparedness and complication readiness were then collected using a researcher administered structured questionnaire adapted from JHPIEGO at the end of the fourth visit. End line data was obtained from respondents who had attended at least three prenatal care sessions.

Data Analysis

Each question was coded and entered into SPSS. The findings were entered in the variable view of the Statistical Package for Social Sciences (SPSS) version 19.0 screen, each question at a time, starting with the first to last questionnaire. Data analysis was done using the statistical program for social sciences (SPSS) version 19. Data was presented in tables, graphs and pie charts. Inferential and descriptive statistics were used to analyze data. Demographic data were analyzed using descriptive statistics. Bivariate analysis was used to determine and control for any confounder at the analysis stage which included age, level of education, parity and occupation. Differences between control and intervention arms were determined using chi-square and independent samples t-tests. $P < 0.05$ was considered significant.

RESULTS

The study was conducted between March 2015 to August 2015 in four health centers of Gem Sub-county which included Malanga, Marenyo, Ndere and Nyawara. The mean age of the respondents

for both the control and interventional group was 24.1 years. In terms of their marital status, 16% were not married while 84% were married in the intervention group while in the control group 15% and 85% were not married and married respectively. Regarding the level of education, this was equally matched between the control and the intervention group with those having primary level education being more than half (53%) while those with secondary level education and tertiary level education were 40% and 7% respectively. There was no significant difference in demographic characteristics between the intervention and control groups ($p>0.05$) as indicated in Table 1. The table demonstrates that the demographic characteristics of the respondents were similar for the end line data.

Table 1: Demographic characteristics among intervention and control groups at the end line

Characteristic	Intervention n=75	Control n=79	Statistic	P-value
Age	24.1 (SD 3.7)	24.1(SD 4.5)	t=0.042	0.967
Marital Status				
Not married	12 (16 %)	12(15%)		
Married	63 (84 %)	67 (85%)	$\chi^2=0.014$	0.906
Education				
Primary	40 (54 %)	42(54%)		
Secondary	30 (40%)	32(40%)	$\chi^2=0.029$	0.986
Tertiary	5 (7 %)	5 (6 %)		
Occupation				
Employed	13(18%)	12 (15%)		
Self employed	27 (38%)	35 (44%)		
None	32 (44%)	32 (41%)	$\chi^2=0.553$	0.743
Gestation at data collection	36.2 (SD 0.7)	35.9 (SD 1.1)	t=1.295	0.198
Parity				
Prim gravida	15 (20%)	15 (19%)	$\chi^2=0.446$	0.504
Multi gravida	60 (80%)	64 (82%)		

175 respondents (90 intervention and 85 control) were recruited for the study while total of 154 respondents completed the study (75 (93%) intervention and 79 (96%) controls). A total of 21 respondents were lost in the course of the study. A total of 53 clients completed the study at Malanga, 43 at Nyawara, 30 at Ndere and 28 at Marenyo

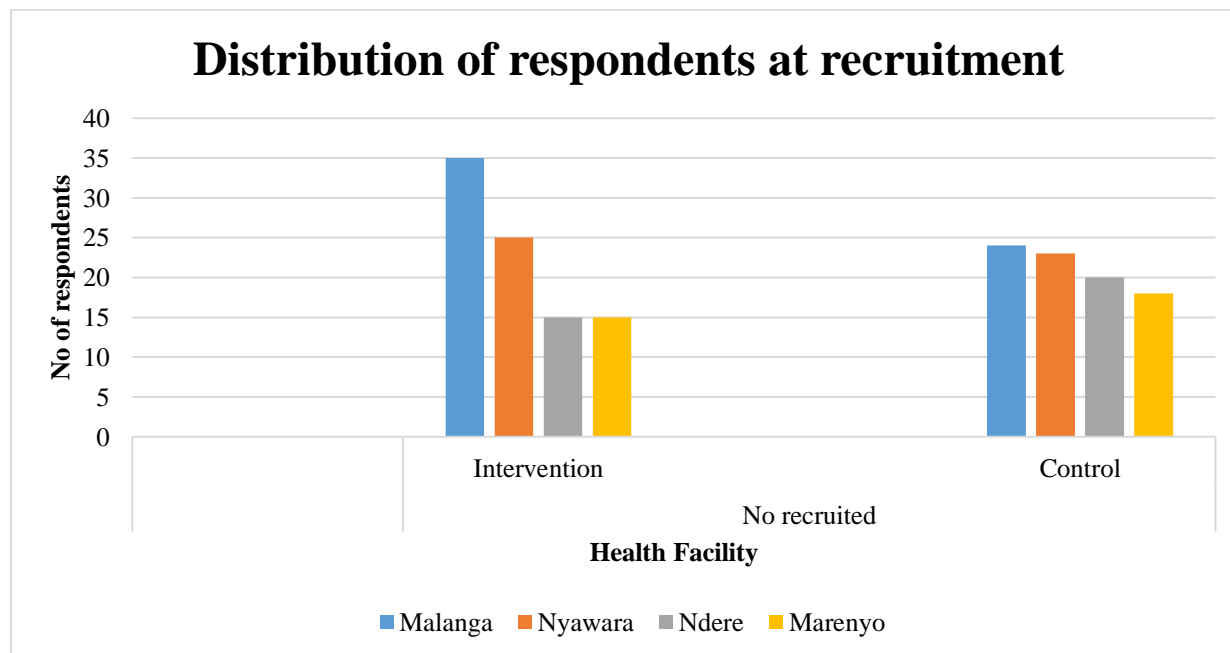


Figure 1: Distribution of respondents at recruitment

During recruitment of the controls, 24, 23, 20, and 18 clients were recruited at Malanga, Nyawara, Ndere and Marenyo health center's respectively as shown in figure 1 above. At recruitment of the intervention group, 35, 25, 15 and 15 clients were assigned to Malanga, Nyawara, Ndere, and Marenyo health centers respectively as indicated in figure 1.

Table 2: Distribution of intervention respondents during every visit

HEALTH FACILITY	VISIT 2	VISIT 3	VISIT 4
MALANGA	32	28	30
NYAWARA	22	23	22
NDERE	12	13	12
MARENYO	15	13	11

A total of 32 respondents in the intervention group attended the second prenatal care visit at Malanga, 22 at Nyawara, 12 at Ndere and 15 at Marenyo. During the third visit, 28, 23, 13 and 13 respondents attended group sessions at Malanga, Nyawara, Ndere, and Marenyo respectively as shown in table 4.1 above. During the fourth visit, 30 respondents attended group care at Malanga, 22 at Nyawara, 12 at Ndere and 11 at Marenyo as indicated in Table 2 above

Table 3 Distribution of control respondents during each visit

HEALTH FACILITY	VISIT 2	VISIT 3	VISIT 4
MALANGA	24	24	23
NYAWARA	22	22	21
NDERE	19	20	18
MARENYO	18	17	17

During the second visit, 24 respondents attended care at Malanga, 22 at Nyawara, 19 at Ndere and 18 at Marenyo. In the third visit, 24, 22, 20 and 17 respondents attended care at Malanga, Nyawara, Ndere, and Marenyo respectively. During the fourth visit, 23 respondents attended care at Malanga, 21 at Nyawara, 18 at Ndere and 17 at Marenyo as shown in Table 2 above.

Birth preparedness and complication readiness (baseline)

Among the 81 women that participated in the pre-test, birth preparedness and complication readiness was 17% as indicated in figure 2

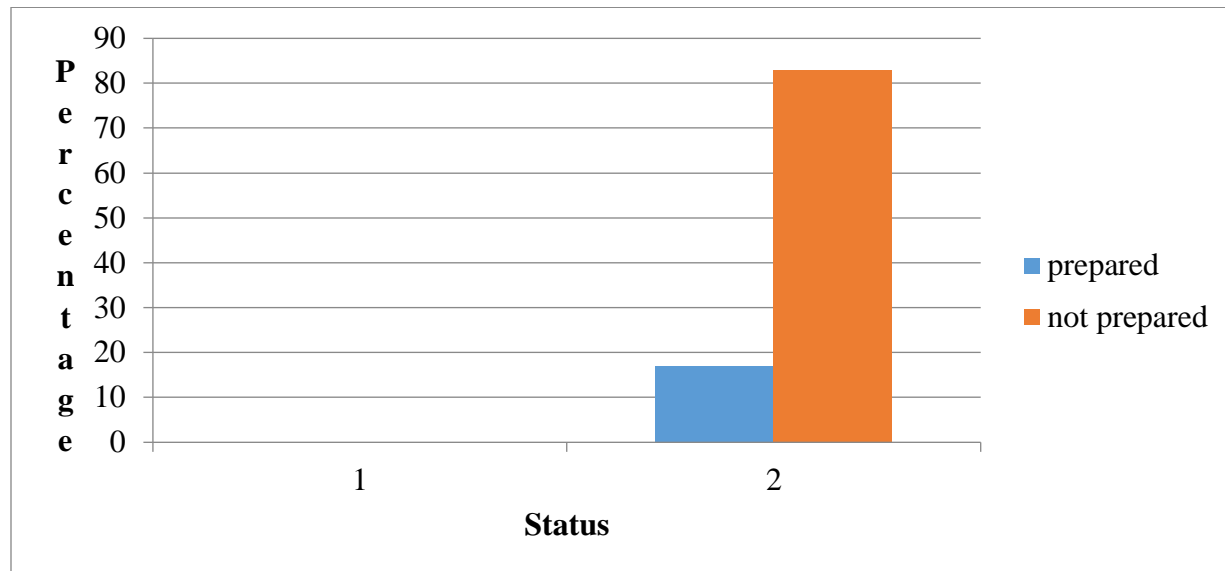


Figure 2: level of birth preparedness and complication readiness at baseline

Birth preparedness and complication readiness were measured with respect to the identification of a health facility with a skilled birth attendant, availability of emergency funds and availability of transport in case of an emergency. Those who fulfilled all three requirements were considered well prepared and ready for complications. There was no significant difference in birth preparedness and complication readiness in the intervention and control group ($p > 0.05$).

Regarding any form of preparation made, the majority of the clients (91% and 89%) in the intervention and control groups respectively had made some form of preparation. In terms of specific preparations made, more than half of clients in the intervention group (54%) had identified transport compared to more than one third (39%) in the control group. Regarding making savings, more than half (57%) of respondents in the intervention group had savings compared to less than half (45%) in the control group. And finally, with regards to the identification of a skilled birth attendant, more than three quarters in both groups (88% in the intervention and 94% in control) had identified a skilled birth attendant as shown in table 4 below.

Table 4 Birth preparedness and complication readiness (end line)

	INTERVENTION n=75	CONTROL n=79	χ^2	p-value
Prepared and ready for complications	29 (39%)	20 (25%)	3.064	0.08
Made any form of preparation	68 (91%)	71(89%)	0.074	0.785
Specific preparations made				
Identified transport	37 (54%)	31(39%)	3.702	0.069
Saved money	39 (57%)	35(45%)	2.136	0.44
Identified a skilled professional	60 (88%)	74 (94%)	1.399	0.237

DISCUSSION

Birth Preparedness and complication readiness

The specific objective was to compare the levels of birth preparedness and complication readiness among women receiving group versus individual prenatal care. The study found that birth preparedness was higher among women in the intervention group compared to those in the control group (38.7% vs. 25.3%), although the difference was not statistically significant ($p=0.08$). This is however different from a randomized control trial conducted by Ickovics et al. (2007) in Connecticut and Atlanta which found that women enrolled for group prenatal care felt more ready for labor and delivery compared to those receiving individual prenatal care ($p<0.001$). The result of this study is also different from the results documented in a study by Kumar et al. (2008) who found out that there was a significant difference in birth preparedness and complication readiness among women attending group and individual care ($p<0.001$). The results are also different from those found by Mullany et al. (2007) who found out that women who received health education in groups were twice more likely to be prepared and ready for complications (RR=1.99, 95% CI, 1.10-3.59). This difference in preparedness could be attributed to the fact that this study was conducted in sites that had not offered group prenatal care before. The level of birth preparedness among the control group was slightly higher compared to a survey by Lem- Kugenabet.al., (2011) in Ghana in which birth preparedness and complication readiness was 23% as well as that done by Hiluf and Fantahun (2007) in which birth preparedness and complication readiness was 22%.

Similarly, a study by Kaso and Adise (2014) documented a level preparedness of 16.5%. This difference in the level of birth preparedness and complication readiness could be attributed to the fact that the study was facility-based and only respondents who had attended prenatal care were included in the study. In addition, the standard content and quality of health education in this study were maintained. There are however other studies that demonstrated higher levels of birth preparedness and complication readiness. In India, four studies (Saha et al., 2014; Aggarwal et al., 2010, Mazumdar et al., 2014 and Mukhopadhy et al., 2013) showed that birth preparedness and complication readiness were 62.8%, 47.8%, 49.4% and 34.5% respectively. In another study in

Nepal by Karkee et al., (2013), birth preparedness and complication readiness were found to be 65%. These differences could be attributed to lower literacy levels in this study setting.

Identification of a means of transport

An advanced transport plan reduces delays in reaching the health facility. It saves time that would have otherwise been used to arrange for transport, especially in emergency situations. These plans should enable a couple to know what transport is available at different times whether day or night, how much it will cost, contact persons and more importantly save money to meet the cost. Identification of transport is key in reducing the second delay which is the delay in reaching the health facility to receive prompt care. It was found that 54.4% of women in the intervention group had identified a means of transport to use in case of an emergency compared to 38.8% in the control group though the difference was not statistically significant ($p=0.069$). These findings are lower compared to other studies by Kaso and Adise (2014) which documented 69.7%, Kabakyenga et al. (2011) who documented 61% and Saha et al. (2014) documented 60%. Other studies that documented better preparations regarding transport are Moran et al., (2006) who documented 46% and Envulado and Zoakar (2014) that documented 54%. This could be attributed to the fact that data was collected after specific birth preparedness and complication readiness interventions had been put in place and therefore the respondents had prior knowledge on the need for making advanced transport arrangements unlike in the setting where the study was conducted that did not have strengthened BP/CR interventions. However, the findings are higher compared to those found by Agarwal et.al, (2010), Mukhopadhy et al., (2013), Udofia et al., (2013) and Markos and Bogale (2011) who documented 25%,15.7%, 24.8% and 7% respectively. This difference could be attributed to the study design, whereby all the birth preparedness and complication readiness messages were communicated during all the prenatal care visits.

Identification of a skilled birth attendant

The study found that 88.2% of women in the intervention group had identified a skilled birth attendant compared to 94% of those in the control arm, though not statistically significant ($p=0.237$). The result of this study is different from the results of an investigation by Kumar et al., (2008) who documented that women attending group sessions were three times more likely to have

identified a health facility for delivery compared to those in the control group (RR= 3.43 95% CI, 2.12-5.54). The difference could be attributed to differences in study settings in which the two studies were conducted. In this study setting, interventions to promote birth preparedness and complication readiness had not been strengthened. The study findings among the controls are higher compared to Agarwal et al. (2011) which indicated 69.6%, Markos and Bogale (2014) 20.5%, Kaso and Adise (2014) 68.9% and Kabayenga et al., (2011) which indicated 61%. The high-level identification of a health facility for delivery could be attributed to the fact that the study was conducted at a period when community strategy approach is being implemented and the number of women seeking skilled care at birth improved.

Savings

More women in the intervention compared to the control arm had some savings to use in case of an emergency (57.4% vs 44.8%) respectively. However, the difference was not statistically significant ($p=0.44$). This finding is consistent in findings from a study by Kumar et al. (2008) who found no significant difference with respect to savings among women enrolled in a group and those enrolled in individual prenatal care ($p=0.09$). This finding is however different from one by Mullany et al. (2007) who found out that women enrolled for group prenatal care were nearly twice more likely to make more than three birth preparedness arrangements which included making savings (RR=1.99, 95% CI:1.10,3.59). The finding among the controls is, however, a low compared to results by Saha et.al (2011), Aggarwal et al., (2010), Mazumdar et al.,(2014), Kaso and Adise (2014) and Kabakyenga et al., (2011) which reported that 75.5%, 76.9%, 84.6%, 97.6% and 91% respectively of the respondents had some savings. The low-level preparedness in savings could be attributed to the fact that over 40% of the respondents were not employed and could therefore not make savings in advance.

CONCLUSSIONS

The study concludes that more women in the intervention compared to those in the control group were prepared for birth and ready for complications. In addition, most respondents in both the control and intervention groups had identified a skilled birth professional which could be attributed

to the free maternity policy. Identification of transport and savings recorded lower responses which could be attributed to the emphasis being placed on skilled birth attendance.

RECCOMENDATIONS

The researcher recommends there is a need to incorporate group care into nursing practice and develop appropriate standards to guide its implementation. In addition, there is a need for policymakers to translate this important finding into policy. In addition, the Ministry of Health and the County Health departments need to ensure regular audits and quality assurance activities are done to ensure that policies are implemented.

DECLARATIONS

Ethics Approval

Ethical clearance to conduct the study was obtained from the Institutional Research and Ethics Committee of Moi University and MTRH.

Competing interest

The author declares that he has no competing interests.

Disclaimer

The findings and conclusions presented in this manuscript are those of the authors.

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