

Use of Community-based Interventions to Promote Family Planning Use Among Pastoralist Women in Ethiopia: Cluster Randomized Controlled Trial

Mussie Alemayehu (✉ mossalex75@gmail.com)

Mekelle University College of Health Sciences

Araya Abrha Medhanyie

Mekelle University College of Health Sciences

Elizabeth Reed

San Diego State University Graduate School of Public Health

Afewerk Mulugeta Bezabih

Mekelle University College of Health Sciences

Research article

Keywords: Afar, Family planning, Pastoralist, Cluster-Randomized controlled trial, male involvement on FP, women's education in FP

Posted Date: July 27th, 2020

DOI: <https://doi.org/10.21203/rs.3.rs-38750/v1>

License:  This work is licensed under a Creative Commons Attribution 4.0 International License. [Read Full License](#)

Version of Record: A version of this preprint was published at BMC Women's Health on August 18th, 2021. See the published version at <https://doi.org/10.1186/s12905-021-01434-x>.

Abstract

Background

- Afar region is one of the pastoralists dominated regions in Ethiopia. The region is characterized by a low contraceptive prevalence rate (CPR) with 5.4%. Lack of awareness, husband objection, and religious influence was the reasons attributed to low CPR in the region. As objective we assessed the effect of a community-based interventions for promoting FP use among pastoralist communities of Afar region state, Ethiopia.

Methods

The design was parallel, cluster randomized controlled trial (CRT) recruiting married women. It had three arms: 1) women's education on FP, 2) male involvement in FP education and 3) control with one to one ratio. A total of 33 kebeles (lowest administrative structure) were randomized and allocated. Women's FP education and male involvement in FP education were the interventions. It was implemented using 1) health education on FP to married women and men by faema leaders (a traditional community-based structure that serves as a social support group) 2) Video-assisted message on FP, and 3) Assisting the faema leader using health workers. The intervention was given for a total of 9 months. FP use and intentions were measured as outcome variables based on woman's perspectives. Cluster level summaries considering a cluster effect analysis was performed. The result was presented with adjusted risks and 95% CI. A p-value < 0.05 was used to declare statistically significant.

Results

There was a positive change in the proportion of married women who use FP in the women's FP education arm, absolute risk (AR) of 0.13(95% CI,0.08,0.17) and male involvement arm with AR of 0.29 (95% CI, 0.23,0.34) as compared to the control arm. In the control arm, the proportion of FP use was 4.3%, whereas it was 17.5% with women who receive FP education and 34% in the male involvement arm. Furthermore, the proportion of married women who had high intention to use FP was high in arms of women's FP education and male involvement with AR = 3.4(95% CI: 2.48,4.91) and AR = 2.1 (95% CI: 1.5,2.95), respectively as compared with the control arm.

Conclusion

The community-based interventions brings a significant change in increasing FP users and intention to use FP.

Trial registration : NCT03450564

Background

In the developing world, including Ethiopia, maternal and child morbidity and mortality have remained high, despite the need for urgent action as declared by different international agreement (1). Such a burden can be averted by using effective family planning (FP) as a means to decrease unintended pregnancy and its consequences and thereby reduce maternal and newborn morbidity and mortality (1). Even though in 2016, there were 300 million women and girls from developing countries using FP -(2)- a considerable number (214 million) of women still had an unmet need for FP in the same year(1). Sub-Saharan African (SSA) including Ethiopia accounts for the highest number of unmet needs for FP among women of reproductive age group with a value of 24.2 and 26%, respectively (3). Apart from this, there is a target to have access and use of FP for an additional 120 million women by the year 2020(2).

Ethiopia sets a goal to achieve a contraceptive prevalence rate (CPR) of 55% and total fertility rate (TFR) of 3 by the year 2020 -(4)- from the current CPR of 41%-(5)- and TFR of 4.6(6). However, FP use among pastoralist communities' is lower than the national average. Pastoralism is a way of life for 12 million Ethiopians and they are located in the most inaccessible areas and remotest part of the country. They are underserved in terms of health, social services, and economic infrastructures

(7). Afar region is one of the pastoralist regions characterized by pastoralist/agro-pastoralist dominating population. The region's FP utilization was low characterized by CPR ranges from 5.4 – 12.7% -(5, 6, 8)-, TFR of 5.5, and unmet need for FP of 17.2% (12.9 for spacing and 4.3% for limiting) (6). It should be noted that lack of awareness among women, religious rooted convictions, and norms against the use of FP and strong husbands' objection towards FP is likely to be the main cause of low FP use and large family size in the region. Hence, such kind of negative norms on FP overshadows women's decision making power in their families and limits their right to access the FP service (9, 10).

In Ethiopia from 2014–2018, the Reproductive, Maternal, and Newborn Health Innovation Fund (RIF) launched a project aimed to enhance the maternal and child health indicators (Antenatal care, institutional delivery and postnatal care) including FP of the pastoralist communities. In the beginning, it quantifies the proportion of women using modern FP and barriers for not using FP. Accordingly, we found only 5.4% of women use FP which was the lowest coverage among the other maternal health indicators. Moreover, lack of awareness among women about FP, husband objection, and religious perspective for not using FP were the most common barriers for having a low proportion of FP users in the region (9). As part of the project, we intend to increase the women who use FP by mitigating the barriers for not using FP in the Afar region, Ethiopia (11). Besides, based on our previous assessment on best practices for addressing socio-cultural barriers related to FP, educating women on FP and male involvement in FP education could be a good strategy to increase the FP use in the region (12). In addition to this, studies done elsewhere outside the pastoralist community shows an increment of FP use using different modalities. For instance, a study in different districts of India deploys an intervention like having group meetings, providing training to rural providers and community leaders – (13)- creating awareness and encouraging inter-spousal communication to enhance FP use(14). Importantly, previous studies in the pastoralist community had already brought a satisfactory change in promoting maternal, newborn, and child health (MNCH). For instance, male involvement, one health approach, having a migratory route of container clinic, mobile clinic and building maternity waiting home are some of the interventions that made a significant contribution in escalating MNCH (15–18). In addition, a study done in a pastoralist community of Kenya to promote male involvement in the MNCH service utilization and to share with other community members under their catchment had brought an improvement in the MNCH service utilization (17). Along with, evidence shows that as the women's decision-making capacity increases, the proportion of women who use FP increases (6, 19). Women's decision making regarding FP can be further enhanced through involving a male partner in FP service (20). Therefore, women's education on FP and male involvement in FP services can be done at the community level to increase the low FP use in the Pastoralist community. In Afar, there is "faema" which is a traditional community-based structure in the pastoralist community that serves as a social support group. It has a long history and high community acceptance and has a separate structure for males and females (21).

Furthermore, the Health Extension Program (HEP) which is believed to be one of Ethiopia's best programs in disease prevention, promoting good health and the use of FP service is less practiced in Afar (22, 23). Also, the women development army (WDA) that was established to strengthen the HEP in creating awareness, increase health-seeking behavior, and building a community sense of ownership has not been yet established despite its practice in the agrarian region of the country(23, 24). Moreover, we have a dearth of evidence on quantifying the effect of women's education on FP and male involvement in FP services for enhancing the number of FP users and intention among married women in the pastoralist community. Hence, using community-based interventions with a focus on approaching the community with the community could be a good strategy to educate the women and men. Along with using the Faema which has a separate structure for male and female, and high community acceptance could be a good strategy for enhancing FP use and intention among the pastoralist community. Also, as a rationale of the study assessing if structured health education provision about FP given by faema is more effective than the unstructured to increase FP use and intention. Therefore, we hypothesized that educating women on FP and having male involvement in FP education as part of community-based interventions could increase the number of married women who use FP and intention. To achieve our goal we employ a rigorous method (cluster randomized controlled trial(CRT)) which is practically feasible, and prevents contamination of the disseminated information at the ground (25). The main aim of the current study was to implement and evaluate the effect of community-based interventions

(women's education on FP and male involvement in FP services) using CRT on FP use and intention among married women in Pastoralist community of Afar region, Ethiopia

Methods

Study Design

A cluster-randomized trial of parallel design with three arms (women's education on FP, male involvement in FP education, and control) was used. One to one ratio allocation of the intervention with a control arm was employed to assess the effect of community-based interventions to promote family planning (FP) use and intention among the pastoralist community.

Participants

The clusters included in the study had at least 30 households with married women. Inclusion criteria for woman's were: being married, and resides in a given cluster as usual place whereas those who declared infertile and seriously ill during data collection were excluded.

Study setting and period

The cluster randomized controlled trial was conducted in the Afar region. Afar Region is one of nine regional states of Ethiopia. The region is composed of five 5 zones, 32 districts, five town administrations and 404 kebeles (lowest administrative unit), and having an estimated population of 1,816,304 out of those 799,174(44%) are females. The majority of the population reside in rural, and are pastoralists or agro-pastoralist in occupation and are Muslim religious followers (4). Three districts namely Mille, Afambo, and Kori were included in the intervention. The region is characterized by high early marriage which is mainly influenced by parental decision, and with a high prevalence of early pregnancy and delivery. It also expressed with high illiterate rate, high TFR, low CPR, and high unmet need for FP (6, 22, 26). A clan-based system favoring large family size, being in a polygamous union of marriage, and a high burden of work among the women is a peculiar characteristic of the Afar women (21, 24, 27). Poor access to health care forces women to travel long distances and often demand the accompany of family members to seek health care including FP. The intervention was carried out for 9 months; from January to September 2018.

Interventions

The intervention targeted at the cluster level with community-based interventions. It includes 1) Educating women in FP and 2) male involvement in FP education. Each intervention (educating women in FP and male involvement in FP education) was compared with the control arm in terms of FP use and intention. The intervention targeted married women in educating women in FP arm and married women and men in the male involvement in FP education arm. The health education in male involvement in the FP education arm was given separately for married women and men. It was designed with the principle of approaching the community with their community member (faema leaders). Faema is a traditional community structure that serves as a social support group. It has a leader, good community acceptance with a separate structure for males and females. It has a long history and feasible to provide the intervention in an area where the health extension programs (HEP) did not strengthen as compare with the agrarian region of Ethiopia (21). Moreover, the women development army (WDA) is a structure at the community level which was evident in the agrarian region to strengthen the HEP in creating awareness, increase health-seeking behavior, and building a community sense of ownership hasn't been yet established. Hence, to enhance FP use and intention among pastoralist community the following community-based interventions 1) health education on FP to married women and men by faema leader, 2) Video-assisted message on FP and 3) Assisting the faema leader using HEW and health workers. It should be noted that, before we provide the FP message to the community a tailored message which is highly acceptable in the community was discussed. Accordingly, the emphasis of the message was given on the purpose of FP for spacing than limiting the number of children. The intervention was guided using an integrated behavioral model (IBM) (28). A detailed description of these interventions described below.

Health education on FP by faema leaders: Initially, intensive training was given for the faema leader on a different aspect of FP by the research team. We trained 2 female and 2 male faema leaders from each cluster for 03 days. The training includes a detailed description of Muslim dominating countries' FP experience and its relation with reduction of TFR and maternal mortality -(29)- and how to starts positively influencing the neighbors in their catchment to use FP. After the training, with the mobilization of the faema leader, a regular meeting on FP was organized at the center of the cluster. The meeting was held twice a month with a 1-hour duration and it was done in the afternoon. The intervention was given for a total of 9-months. A constant schedule was prepared to keep the provision of health education message uniform across clusters in each session. The content of the sessions for the female faema leaders includes information on the definition of FP, type of FP, the purpose of FP, effectiveness, and duration of prevention. It also included sessions that covered myths and misconception on FP and its side effects, how to overcome the pressure/ resistance comes from influential groups (husband, neighbors, clan and religious leaders) on FP and being a role model by starting using of FP. In line with the above description, the schedule and time allocated for health education of male faema leaders in the male involvement in FP education arm were similar to the faema leader, however, the content of the health education gives due focus on the active involvement of males in FP service. It includes allowing his wife to use FP, accompanying her to the health facility, reminding her of the schedule of taking FP, participating in choosing the type of FP, providing her financial support, and helping her in domestic activity. Also, it includes FP information (definition, type, purpose, effectiveness, duration of prevention, myths and misconceptions) (Figure 1). Importantly, a logbook or registration book was prepared to follow the progress of the intervention. It contains the name of the participants, age, and type of topic discussed FP in each session of health education. The logbook was checked for its delivery by the research team once a month.

Video-assisted message on FP: A video recorded message that deals on FP from the district's FP experts and information from married who started to use FP for both arms were disseminated to the community. The video recorded message from married women deals with the life experience related to FP (its process, benefit, possible challenges, and action was taken). And the video recorded message from the district's FP experts includes the benefit of FP, type of FP, possible side effect, its management of FP, and availability of FP in health facilities. The recorded video message on FP was uploaded to tablet smartphone. The tablet with its accessories was given for the faema leader to disseminate the FP message while they teach the community under their cluster. It was given for a total of 6 months. Training on how to operate, deliver, and teach the recorded video message was demonstrated and re-demonstrated by the faema leader. All the FP message was prepared in the local language "Afarri". Along with a video recorded message from a male who actively involved in FP services, and religious leaders were delivered for the male involvement in FP education arm. In the beginning, the importance of FP use was discussed with the religious leaders, and a consensus was reached. After the religious leader agreed on the importance of FP, the message on FP vs Islamic religion with the focus of FP use did not contradict their religion was recorded and disseminated. And these messages were used to teach the male in the male involvement in the FP education arm. Moreover, the life experience of those men who actively involved in FP services such as; allowing his wife to use FP, accompanying her to the health facility, participating in choosing the type of FP, providing financial support and helping her in domestic activity was recorded and used to teach the male in the male involvement in FP services arm.

Assisting faema leader using HEW and health workers: Along with the provision of health education at the cluster level by the faema leaders, the health care providers working in FP at the intervention arms took orientation and training on making the health facility ready for FP service, availing method mix, managing side effect, and counseling married women on FP use based on informed consent. Furthermore, the health extension workers (HEW) at the intervention cluster were trained on how to assist faema leader during FP related health education programs and provide house to house counseling to voluntary married women on how to use FP services. They also facilitate opportunities for using health centers when married women prefer to use a long-acting contraceptive.

Measurement of the outcome variables

The purpose of this study was to evaluate the effect of community-based interventions (women's education on FP and male involvement in FP education) compared to the control group at the cluster level to increase the women's FP use and intention.

It was measured based on the married woman's FP use and intention. The primary outcome was FP use with the question of "Are you or your partner currently doing something or using any method to delay or prevent getting pregnant". Moreover, a modern type of FP (pill, Depo-Provera, Jadelle, Implanon, IUCD, etc) currently used by the women or her husband was collected. Intention to use of FP was used as a secondary outcome variable. A total of 8 items that range from the lowest level (*At this moment, I can list some benefits of FP use and I would gain if I use it*) to the highest level of intention to use FP (*It is expected that women in our community should use FP and so do I*) was used. The response ranges from 1 (uncertain /Disagree) to 3 (Certain/Agree). The response was summed up to form a continuous variable. It was categorized based on the response of married women mean value in to "low intention to use FP" and "high intention to use FP" for those married women who scored mean and below mean and above mean, respectively. In addition to the primary and secondary outcomes, the following variables were collected. The community responsibility was collected to describe the responsibility of her husband either as a clan, religious, and faema leader. In line with this, being a faema leader for the married women also included as community responsibility. Along with a positive/yes response for the current use of FP, the status of her husband to know for the current use of FP, and the type of support obtained from her husband included in our study. To list the type of support; accompany the health facility, reminding the schedule for taking the FP, participating in choosing the type of FP, and either helping them in domestic activity or not.

Any changes to the trial outcomes after trial commenced

Even though, we strictly follow the protocol we have the following deviation from the original: First, in the beginning, we intend to provide the intervention for six months, however as the project life extended we provide the intervention for 9 months ; Second) we plan to analyze that data using Generalized estimating equation (GEE) which allows for baseline or covariate adjustment in the final model. However, we are unable to run the model with GEE due to the limited number of clusters per arm (<15). Hence, we use cluster-level summarizes to analyze the collected data and to report our result (30).

Study design, sample size determination, and sampling procedure

The sample size was calculated using the literature of Richard and Lawrence-(31)- to determine the number of clusters required to detect a difference among different arms. Given a current FP utilization in Afar region of 11.6% -(6)-expected changes to be acquired following the intervention of 20%, 90% power, 95% confidence interval, considering the intracluster correlation of $\rho=0.05$, adjusting for non-response of the individual in a household of 20% and a design effect of 2.2. Taking an assumption of an equal number of clusters and the cluster sample size, the final sample size was 33 clusters and 891 married women. One cluster had 27 married women. Per arm, we include 11 clusters and 297 married women. A systematic sampling technique was used to select 27 married women from one cluster. A sampling fraction was calculated based on the total number of married women in the cluster. A random start number was selected to identify the first married woman in the clockwise direction. Hence, 9 clusters (5 male involvement and 4 women education) of Afambo, 7 clusters (5 male involvement and 2 women education) of Mille and 6 clusters (2 male involvement and 4 women education) of Kori were included in the intervention.

Randomization

We used a cluster randomized controlled trial parallel-group design with three arms. Using a computer-generated random number, the number of clusters was allocated into three arms (women's FP education, male involvement in FP education, and control) in simple randomization. To avoid bias during the process, the allocation of the clusters was done by another researcher and the result was communicated with the principal investigator. Moreover, the participants were blinded to the type of intervention.

Data collection tool and procedure

We developed a questionnaire for the purpose of this study and attached as Additional File 1. The developed tool was piloted in 10% of the sample after it was developed by reviewing different literature on the previous finding that aims to explore

barriers and facilitators to Reproductive Maternal Neonatal Health (RMNH) services including FP (6, 9, 10, 26). The collected piloted tool was exposed to a reliability test. It was done to assess the consistency of items in each construct (Cronbach's Alpha > 0.7). Besides, exploratory and confirmatory factor analysis was done. After all necessary modifications followed the piloted test, the tool was pretested in 5% of the sample to assure wording, skip pattern, and determine the time allotted to complete one interview. A repeated cross-sectional type of follow up data was used to collect the intended information from married women. It contains baseline and end-line data collection with a nine-month duration. As outcome variable FP and intention to use was collected. FP use was collected by asking the married women whether the mother or her husband currently doing something or using any method to delay or prevent unwanted pregnancy. Along with, intention to use of FP was constructed of 8 items had Cronbach alpha of 0.935, explained 87.7% of the variance with Kaiser-Meyer-Olkin (KMO) of 0.846 and Bartlett's Test of Sphericity of 0.00. Moreover, on its confirmatory result, it had a result of 258 chi-squares, 13 degrees of freedom. The Root Mean Square Error of Approximation [RMSEA (90%, CI)] was 0.146(0.130,0.161) whereas its Standardized Root Mean Square Residual (SRMR) was 0.045. And the tool had a Comparative Fit Index (CFI) of 0.969 and Tucker-Lewis Index (TLI) of 0.950. Six clinical nurse data collectors and 2 supervisors were used to collecting the data after they got training on the items and how to use mobile-based applications. They were recruited outside the study/intervention areas and assigned to a different cluster of given districts. The baseline and end-line data were collected using an electronically smartphone-based application open data kit (ODK). Immediately after the data checked for its completeness, it was sent to the Mekelle University (MU) server where the data were accessed and utilized by the research team.

Data Quality Control

The data collectors and supervisors were trained. Regular supervision and follow-up were made by supervisors. A reliable and valid tool was used. The data were collected using a mobile-based application (ODK) which ensures skip pattern; immediate scanning of the collected tool in the server, friendly to use, and avoids cost for paper duplication. The progress of the intervention monitored through the logbook or registration book. Intensive training was given for faema leaders, HEW, health care providers, and religious leaders. A tablet-based video FP message of (married women who use FP, male partner actively supports his wife to use FP and message from religious leaders and district FP expert) was used as part of our interventions to teach married women and men about FP. Furthermore, information on the data monitoring and safety, a team from Mekelle University, Samara University, and the Afar regional health Bureau was established. Accordingly, volunteer married women will go to a health facility and counseled to use contraceptives based on their informed consent at health facilities by the health care providers. The research team takes an effort to minimize the risk and maximize the benefit by following the provision of intervention using the protocol. And, there was no risk reported following the provision of the intervention.

Statistical Analyses

The data collected using ODK was exported to R software version 3.4.2 for analysis. Intention to treat analysis was used as a framework of analysis. All the analysis was used with a 95% confidence interval (CI) and p-value < 0.05 used to declared statistically significant. Since the number of clusters per arm was 11 per arm, a cluster-level summary was used(28) to compare the women's education and male involvement in the FP use group with the control group. A separate cluster-level summary analysis was done to control arm with the woman's arm and the male arm with the control arm by considering the cluster effect. Finally, the result of FP use and the intention was described with t-test, df, P-value, mean value of both groups (control and intervention), and adjusted risk with its 95% CI. Moreover, the prevalence ratio (the number of FP users at the end line divided to baseline) and odds ratio were calculated for FP use and intention to use (30).

Results

Participants and cluster flow

A total of 43 clusters were eligible for the study, out of these 7 clusters did not fulfill the inclusion criteria (30 households, which contains married women and less) and 3 clusters were unable to reach due to the breaking of the bridge due to flood.

Hence, 33 clusters were allocated to women's education, male involvement in FP education, and control arm. Hence, the 33 clusters were followed and analyzed. And there was no attrition from clusters. The variance of the cluster for FP use in the women's education on FP arm was 10.03 and 12.29, respectively before the intervention and after provision of the intervention (Figure 2). The trial stayed for a total of 9 months; start at Jan-2018 and the trial ends on Sep-2018.

Baseline and end-line data information of respondents on selected variables

A total of 891 respondents with 297 in each arm participated in the baseline data. In the male involvement in FP education arm, the mean age of the respondents was 25.9 (± 6.42), heard of FP 269(90.6) and use of FP 17(5.72). Furthermore, in the end line data the mean age was 26.8 (± 6.10), heard of FP 279(90.3) and use of FP 102(34.3) in the male involvement in FP education arm in FP education arm (Table 1).

Estimation of FP use among married women per their arms

The level of analysis in this trial was cluster-based. The number of respondents (proportion) reporting yes in use of family planning was 13(0.48), 52 (1.93), and 102(3.78) among the control, women's FP education, and male involvement in FP education arm, respectively. Besides, the cluster mean (SD) for responding yes to family planning use was 0.043(0.03) in control, 0.175(0.05) in women's FP education and 0.343(0.09) in the male involvement in FP education arm (Table 2).

Prevalence ratio on FP use based on the baseline and end-line data per arms

The number of respondents who use contraceptives was 7 in the control arm, whereas it was 17 in the male involvement in FP education arm, during the baseline data. Besides, the number of contraceptive users increase to 102 in the male involvement in FP education arm where it was only increased into 13 in the control arm, after the intervention. Hence, the prevalence ratio (end line FP users divided to baseline FP users) was 1.8 in control, 3.7 women's FP education, and 6 in the male involvement in FP education arm (Table 3).

Characteristics of FP users by study arms in the end-line data

In the male involvement in FP education arm, 9(8.8%), 10(9.8%), and 17(5.7%) of the FP users accounted for the respondents or their husbands with community responsibility of religious, clan, and faema leaders, respectively. Depo-Provera was the most common 87(85.3) type of FP used in the male involvement in FP education arm. Eighty-eight (86.3%) and 86(97.7%) of the respondent in the male involvement in FP education arm, their husband knows for the current use of FP and they provide different types of support, respectively. These supports were accompanying to health facility 66(76.7%), reminding the schedule 81(94.2%), and participating in choosing the type of FP (Table 4).

Effect of community-based interventions (women's education on FP and Male involvement in FP education) on FP use

The difference of FP use in women's education on FP and control arm is 0.13 and the 95% confidence interval is 0.08 to 0.17. And without the intervention (control arm) the proportion of FP use is about 4.3% and with the intervention of women's education on FP, it is 17.5%, an absolute risk increases of about 13%, but this might be as little as 8% or as much as 17%. Besides, to the male involvement in FP education versus the control arm in FP use, the difference is 0.29 and the 95% confidence interval is 0.23 to 0.34. And without the intervention (control arm) the proportion of FP use is about 4.3% and with the male involvement in FP education is 34.3%, an absolute risk increases of about 29%, but this might be as little as 23% or as much as 34%. Conversely, the baseline characteristics of FP use were not significantly different from the control group with male involvement in FP education ($t=1.82$, $p\text{-value}=0.0895$). Moreover, the FP use for control arm in the baseline data was not significantly different with women's education on FP arm ($t=1.4$, $p\text{-value}=0.1823$) Furthermore, the difference of high intention to use of FP and its 95% CI among the women's education on FP and male involvement in FP education with control arm is 0.18(0.03,0.31) and 0.3(0.17,0.42), respectively. And without intervention, the proportion of women who has high intention to FP use is 12.9%, an absolute risk increase of about 1.8% among women's education on FP and 3% in male involvement in FP education arm (Table 5). Married women in the male involvement in FP education and women's education

on FP have an approximate odds ratio of 11.4(6.23,20.93) and 4.6(2.46,8.71) more likely to use FP as compared with the control group, respectively. Similarly, married women in the male involvement in FP education arm and women's education on FP arm have 3.4(2.48,4.91 and 2.1(1.50,2.95) high intention to use of FP, respectively as compared with the control arm.

Any potential harms of the trials

The study report that there was no adverse event following the provision of the intervention due to the following reason; 1) the decision for taking contraceptive mainly depends on the informed choice of the married women, 2) the provision of counseling was provided by a trained health professional at healthcare facilities and it includes management of potential side effect and action to be taken,3) there was a team which deals with data monitoring safety which was responsible for the provision of the intervention based on the protocol.

Discussion

As a limitation of our trial, the evaluator of the outcome measures was not blinded to the type of intervention. Since the number of clusters allocated here small, we employ a cluster-level summary analysis that did not account for covariate or baseline data adjustment in the final model. However, the proportion of women who use FP in the control arm vs male involvement in FP education and control arm vs women's education on FP is not significantly different at the baseline data. The intervention was targeted at a group level and it did not consider a couple of level counseling on FP. And, the intervention period (9 months with the provision of education twice a month) may be a short time to bring a huge change in FP use. Moreover, we are not able to adjust the baseline or covariate during analysis in the final model And our study will be generalizability intends to similar pastoralist community. Furthermore, even though CRT prefers to prevent contamination of information, we did not employ a buffer zone. However, the intervention cluster was separated from the control cluster by a distance of 20-40 km.

Our finding revealed that women's FP education and male involvement in FP education as a community-based intervention bring a significant change in increasing FP use and intention among the pastoralist community. Our findings will be generalizable to a similar pastoralist community. The study was done among 33 clusters with three arms: women's education on FP, male involvement in FP education and control arm using a cluster randomized controlled trial. It was accompanied by applying different interventions; delivery of FP message by faema leader for a total of 9 months, with the frequency of twice a month. It was also supported by a video-assist message on FP and assisting the faema leader by HEW. The intervention was directed through an integrated behavioral model (IBM). Clustering effect was considered during data analysis.

A pre-post study done in Mali revealed that an increment of FP use. The study employs three groups: community-based contraceptive distribution (CBD), education and control. In the CBD, in assistance of the local chief, each village asked to select an FP promoter (male and women). They were responsible to provide FP education via group meetings, home visits and to sell contraceptives for the same sex. In addition to this, intensive training was given for community health agents and nurses to provide education only. Overall, they found an increment of FP along with the three groups with a higher increment in the CBD. In line with the Mali study, our study uses the same principle of approaching males via males and women via males in an area where the women had poor decision-making power in FP use. It should be noted that we use a community-based structure (faema leader) which has high acceptance in the community. However, our study revealed that women's FP education and male involvement in FP education as a component of community-based interventions brings a significant change in increasing FP use as compared with the control arm. This might be due to our approach with an emphasis on faema leaders to provide health education than to sell contraceptives and collect money. Hence, this would reduce work overload on the faema leader and helps to concentrate on a single task. Along with this, we have a difference in the provision of health education about FP on a regular basis (twice a month) and the video-assisted message of the influential group was also considered and included. In contrast, contraceptive stockout, unable to give the education of FP by the promoters due to illness and not having a regular basis in the provision of education was seen challenges in the Mali study.

In line with our study, different study elsewhere done on community-based interventions using different approaches supports our finding. For example, a study done in rural India increased inter-spousal communication (43 vs 13%-point change) and increased uptake of contraceptives uses (27 vs 5%-point change) in the intervention and control, respectively among young married couples with a group meeting and individual counseling by strengthening the capacity of frontline health functionaries. The delivery of the intervention was targeted at spousal level (inter-spousal communication and decision making), family level (by sensitizing family members to early and repeated pregnancies), community-level (advocating young married women health needs and rights among influential community members) and strengthen health system(14). Moreover, in the Kinshasa study, they recruited community-based distributors (CBDs) to have a group discussion, individual counseling, distribution of contraceptive (condom, pills, and CycleBeads) and arranging referral (32). Besides, a study done in Bahir district of India reports that an increment of FP following provision of training to the rural provider and community leaders, group meeting, and disseminating message using street theatre and wall painting for a total provision of the intervention 21–27 months. A male and female agent was used to approach the men and women group, respectively in providing information and arranging referral as part of the intervention (13). Furthermore, a retrospective pre-post study in Pakistan on a community-based integrated approach to changing women's FP behavior for the past 24 months found that an increment of 10.7% contraceptive prevalence rate with Sukh's initiative: create awareness, encourages intra-spousal communication, distribution of contraceptive and arrange a referral for better service (33). Hence, education including women's education on FP is a good intervention to improve FP use by increasing the health-seeking behavior and health status of pastoralist women. Besides, it increases their ability for self-determination and access to financial freedom to get quality of care including FP service. The overall women empowerment could be positively influenced by women's education on FP with their ability to convince the influential group (husband, clan and religious leader), positively influence their neighbored women and her child, increase access to information, easily absorb health education messages, critically think and take corrective action. And evidence shows that empowered women are more likely to seek and use health services including FP. One component of women empowerment is participating women in decision making in all aspects of health including FP. Hence, such empowerment can be facilitated through the active involvement of men in FP use (6). Hereafter, such collective influence would help the mother to create comprehensive knowledge on FP, having a positive attitude which in turn has an effect in increasing the FP uses and intention.

A cluster-randomized controlled trial (CRT) with the Bandedereho couples' intervention engaged men and their partners in participatory, small group sessions of critical reflection and dialogue. From its 15 sessions on a different topic, FP included as one session with the aim of the description on the benefits of FP, provide information on different contraceptive methods and the value of couple communication. And they found a significant improvement of FP in the intervention as compared with the control group (34). A similar CRT in India with the focus of married men and couples brings a significant change in contraceptive use. It uses assessment, dialogue, education, FP Goal Setting & Action Plan, and provision of condoms and pill as well as contraceptives using trained village health care providers (35). Moreover, a quasi-experiment study in rural Vietnam reports a significant change in increasing the intrauterine device (IUD) utilization between the control and intervention groups. The intervention intended to provide tailored messages and counseling on IUCD for the male to make/allow his wife to use in the intervention group, while no intervention was done in the control group. The intervention was made two round contact in 6-months and it was guided by social cognitive theory(36). In line with these studies, our study finds that a significant increment in FP uses for married women in the male involvement in FP education arm as compared with the control arm. It should be noted that male involvement in FP education helps not only in accepting a contraceptive but also in its effective use and continuation. One mechanism to improve male involvement in FP education could be achieved in the provision of health education messages to improve the beliefs and attitudes of men (37). Importantly, our study delivers the health education message on FP in a group setup using the male faema leader to approach the male in a cluster. However, the Rwanda study uses a couple of bases in the provision of an FP message which ensures spouse communication even though it depends on the local context. For instance, at the beginning raising the issue of FP was considered as a taboo with the negative influence of influential groups (husband, religious and clan leaders). Conversely, approaching males via male in a group discussion on FP and reaching in consensus with the influential groups on its importance is vital and strictly followed

to enhance FP use. This implies using an alternative mechanism based on the local context in the disseminating FP message puts a strong impact on the current practice of and intention to use.

Furthermore, male involvement in the Maternal, Newborn and Child Health (MNCH) in the pastoralist community of Kenya brings an increment in the service utilization other than FP. Importantly, using the male structure (Boma model), they mobilize community, harmonization, and integration of different community structures, women empowerment and enhancing community participation in health service delivery (17). This illustrates male involvement is feasible and brings a remarkable change in the pastoralist context. It should be noted, married women in our study embedded in strong religious and cultural perspectives which favors a large family size, high husband objection for not practicing of FP and poor decision-making for FP use (9, 10, 26). Moreover, all aspects of the health and wellbeing of the pastoralist women strongly affected by religious perspective and belief -(18)- and the community believed that all health problems are caused by supernatural forces (38). And, such strong resistance on FP can be resolved with a continuous discussion with the influential groups on the importance of FP as it was evident in our study. For instance, a religious leader preaches the community to use FP. As a result, a considerable number of married women whose husband participating in community responsibility of either religious or clan leader start to use FP in our study. Hence, having male involvement and use of religious leader to disseminate information on FP is crucial as it was evident in this study. Hereafter, this would create a golden opportunity for the women to use FP, get psychological, emotional and financial freedom to FP use. This would help to improve the health status of the mother and her child by having optimal birth spacing, mitigate unwanted pregnancy and its consequence, improves the economy of the household and mental satisfaction.

Our study deploys different interventions to bring a significant change in FP use. One of the strategies is to train faema leader-(21)- to teach the community member in their catchment. The teaching community is a novel strategy to bring a behavior change, however, such a strategy would be effective if the change comes from the change agent as it was evident in our study where a considerable faema leader uses FP. Furthermore, we bring a significant change in increasing the number of married women who use FP in our study. However, when we see the method mix, most of the married women use short-acting contraceptives. Hence, further effort is needed to shift the short-acting FP users to long-acting FP which is effective, cheap, reduce work burden and needs less visit of the married women to the health facility(39).

Our study account that there was a significant change in intention to use FP in male involvement and women's education on FP following the provision of FP education by faema leaders. This also supported by other studies conducted elsewhere (40-44). The effect could be explained by the fact that having good/high intention is an important factor for women to use FP by considering the effect of having comprehensive knowledge and a positive attitude towards FP use. This implies that tailoring the intervention based on the context of the pastoralist community using faema leaders brings a significant change in enhancing the number of women who intend to use. However, this requires further effort to create a sense of ownership by the community and discussing with the governmental officials to consider the existing structure in the provision of future intervention about health and health promotion activities.

A study in Mali identifies the following challenges; community reluctance to accept FP message and use, insufficient funds to purchase contraceptive, unable to cover all the segment of the community in the provision of health education, religious influence with the concept of contraceptive use is prohibited by Islam fear of the community member to included their name in the promoter notebook. To overcome such challenges, increasing the number of the education sessions, arranging a group talk in a break and reassured the community names and personal information would be kept confidential by the promoters(40). Also, weak Interaction with clinical Services, having weak support and supervision of Community-Based Distributors and Recurring Stock-Outs of contraceptive(32). In line with these studies, our study deploys the following mechanism to minimize the challenges in the provision of the interventions. First, a tailored message which has high acceptance by the community was discussed. Accordingly, the emphasis was given to FP for spacing than limiting. Second, influential groups like religious leaders were approached and reach in consensus to disseminate information on FP using recorded video. Third, we provide an education message on FP to promote and to ensure spousal communication and male support. Fourth, adequate preparation on the mobilization of the community member to attend the group FP education was

done continuously by the faema leader in assistance with the HEW. Along with this, we use a video recorded message on FP to educate the community on FP. Fifth we engage the important stakeholder from the beginning to avail contraceptive, method mix, counseling based on the informed consent and to provide the FP service without a fee.

Our study is a novel study on pastoralist communities in the area where married women embedded with strong cultural and religious perspectives promotes a high number of children and taboo to discuss FP. As an approach, we use the existing community-based structure like faema to enhance the number of FP users and intention. Besides, it employs a cluster randomized controlled trial study design, which is methodologically strong. And it employs an integrated behavioral model that guides the provision of the intervention in an area where the married women embedded in the influence of the husband, religious leader, and social norms don't promote FP use and promotes a high number of children. Moreover, approaching the community with the community's existing structure like faema which has a separate structure for both sexes, high acceptability, and long history would be vital for its feasibility and scale-up the intervention. Finally, our study uses a reliable and valid tool with the family planning aspect in the pastoralist context.

Conclusion

Our finding revealed that women's education on FP and male involvement in FP education brings a significant change in increasing the number of women who use FP and intention. Using the faema structure in the pastoralist community appears to be effective in increasing the number of women FP users.

Abbreviations

AOR, Adjusted Odds Ratio; AMREF, Africa Medical Research Fund; CPR, Contraceptive Prevalence Rate; CRT, Cluster-Randomized Controlled Trial; DFID, Development for International Fund; RIF, Reproductive Innovative Fund; EDHS, Ethiopian Demographic Health Survey; FMOH, Federal Ministry of Health; FP- Family Planning; HSTP- Health Sector Transformation Plan; TFR- Total Fertility Rate; WHO, World Health Organization

Declarations

Ethics approval and consent to participate

The study protocol was approved by the Institutional Review Board (IRB) of Mekelle University College of Health Sciences with a reference number of ERC 1435/2018. Permission was obtained from all relevant authorities in the Afar regional health bureau and participating district health offices. In the beginning, community consent was secured from the influential group (religious and clan leader). Verbal consent was secured before conducting the interviews. A one-page consent letter was attached to the cover page of each questionnaire as an information sheet which includes a detail description about the purpose of the study, benefit, and risk of participating in the study, participation is voluntary, the right to withdraw from the study, identification of informant was possible only through specific identification numbers and the privacy and confidentiality of collected information. The trial was registered in a ClinicalTrials.gov with a reference number of NCT03450564. And it can be accessed using <https://clinicaltrials.gov/ct2/show/NCT03450564>.

Consent for publication

Not applicable.

Availability of Data and Materials

Our data will be available upon a reasonable request and researchers would access an anonymized version of the data set either from the BMC Women Health Journal or through a direct request to the corresponding author via email (mossalex75@gmail.com).

Competing interests

The authors declare that they don't have competing interests.

Funding

This study was conducted with the financial support of the Federal Ministry of Health of Ethiopia (FMOH) through the support Development for International Development (DFID through the Reproductive Innovative Fund (RIF) project. The Funders has no role in the design, analysis, and dissemination of the finding.

Authors' contributions

MA contributed to the initiation of the study, design, data collection, data analysis, and write up. AAM and AM contributed to the initiation of the study, design, and write up. ER contributed to the interpretation of the findings and write up of the manuscript. All authors read and approved the final manuscript.

Acknowledgment

We are grateful to thank the data collectors, supervisor and study participants for the successful accomplishment of the study. Besides, we would like to thank the faema leaders, health care providers, and religious leaders participating in the provision of the intervention. Finally, we would like to thank, Afar regional health bureau, Mekelle University, DFID and FMOH.

References

1. Singh S. Adding it up: The costs and benefits of investing in family planning and maternal and newborn health. New York: Guttmacher Institute and United Nations Population Fund; 2009.
2. Scoggins. Bremner. FP2020 momentum at the midpoint 2015–2016. <http://progress.familyplanning.org> 2020.org.
3. Izugbara CO, Wekesah FM, Tilahun T, Amo-Adjei J, Tsala Dimbuene ZT. (2018). Family Planning in East Africa: Trends and Dynamics. African Population and Health Research Center (APHRC), Nairobi, Kenya: 2018.
4. FMOH. Health sector transformation plan 2015/16–2019/20. October, 2015.
5. Ethiopian Public Health Institute (EPHI) [Ethiopia] and ICF. Ethiopia Mini Demographic and Health Survey 2019: Key Indicators. Maryland: EPHI and ICF.: Rockville; 2019.
6. Central Statistical Agency (CSA) [Ethiopia] and ICF. Ethiopia Demographic and Health Survey 2016: Key Indicators Report. Addis Ababa, Ethiopia, and Rockville, Maryland, USA. CSA and ICF. 2016.
7. The world Bank
Empowering Ethiopia's Pastoral and Agro-pastoral Communities: October 6, 2016
The world Bank. Empowering Ethiopia's Pastoral and Agro-pastoral Communities: October 6, 2016:
<https://www.worldbank.org/en/news/feature/2016/10/11/empowering-ethiopias-pastoral-and-agro-pastoral-communities>.
8. Central Statistical Authority [Ethiopia] and ORC Macro. Ethiopia Demographic and Health Survey. 2000. Addis Ababa, Ethiopia and Calverton, Maryland, USA: Central Statistical Authority and ORC Macro. 2001.
9. Alemayehu M, Araya AM, Kibrom B, Yemane G, Tesfay H, Selemawit AB, Mohammed A, Afework M. The Levels of utilization of reproductive, maternal and neonatal health services among women from pastoralist communities in Afar, Ethiopia: across-sectional survey. *Ethiop J Health Dev.* 2018;32(Special Issue):34–42.
10. Alemayehu, et al. Family planning use and associated factors among pastoralist community of afar region, eastern Ethiopia. *BMC Women's Health.* 2016;16:39. DOI 10.1186/s12905-016-0321-7.
11. Pathfinder International

The Reproductive, Maternal, and Neonatal Health Innovation Fund Project:Lessons Learned from Technical Assistance, 2014–2018:

Pathfinder International.The Reproductive, Maternal, and Neonatal Health Innovation Fund Project:Lessons Learned from Technical Assistance, 2014–2018:<https://www.pathfinder.org/publications/reproductive-maternal-neonatal-health-innovation-fund-project-lessons-learned/2018>.

12. Wester KC, Medhanyie AA, Spigt M, Beumer C, Alemayehu M, Beyene SA, et al. Best practices for addressing socio-cultural barriers to reproductive, maternal and neonatal health service utilization among women from pastoralist communities of Afar, Ethiopia: A qualitative study. *Ethiop J Health Dev.* 2018;32(Special Issue):4–12.
13. ElkanE.Daniel, Masilamani R, Rahman M. TheEffect of Community-Based Reproductive Health Communication Interventions on Contraceptive Use Among Young Married Couples in Bihar,India. *International Family Planning Perspectives.* 2008;34(4):8.
14. Behera J, Sarkar A, Mehra S, et al. Encouraging Young Married Women (15–24 Years) to Improve Intra-Spousal Communication and Contraceptive Usage through Community Based Intervention Package in Rural India. *J Contracept Stud.* 2016;1:4.
15. Downie K. A review of good practice and lessons learned in programming for ASAL populations in the Horn of Africa. UNICEF ESARO, 2011.
16. Jillo JA, Ofware PO, Njuguna S, MwauraTenambergen W. Effectiveness of Ng’adakar in Bamocha model in improving access to ante-natal and delivery services among nomadic pastoralist communities of Turkana West and Turkana North Sub-Counties of Kenya. *Pan Afr Med J.* 2015;Apr 23:20:403. doi:10.11604/pamj.2015.20.403.4896.
17. AMREF Kenya. The ‘BOMA’ health delivery model: an innovative approach to delivering maternal, newborn and child health services to semi-nomadic communities in hard-to-reach regions, 2013.
18. El Shiekh B, van der Kwaak A. Factors influencing the utilization of maternal health care services by nomads in Sudan. *Pastoralism.* 2015;5:23.
19. Wuni C, Turpin CA, Dassah ET. Determinants of contraceptive use and future contraceptive intentions of women attending child welfare clinics in urban Ghana. *BMC public Health.* 2018;18(79):8.
20. Rebecca Shore.Women of the World: Empowerment in Health and Development: Male involvement in Family Planning Empowers women. *knowledge for Health.* August 10,2011: <https://www.k4health.org/blog/post/male-involvement-family-planning-empowers-women>: Accessed at July 15,2019.
21. Key CW, Araya AM, Mark S, Mussie A, Selemawit AB. Abiy HS.,Ephrem TL., Afework M.Best practices for addressing socio-cultural barriers to reproductive, maternal and neonatal health service utilization among women from pastoralist communities of Afar, Ethiopia: A qualitative study. [*Ethiop J Health Dev.* 2018;32(Special Issue):4–12.
22. Crigler L, et al., Community Health Worker Assessment and Improvement Matrix (CHW AIM): A Toolkit for Improving Community Health Worker Programs and Services. Published by the USAID Health Care Improvement Project, 2011.
23. Wang H, et al., Ethiopia health extension program: an institutionalized community approach for universal health coverage2016: World Bank Publications.
24. FMOH.Health development army (HDA). Its origins, development and current status: The health documentation initiatives Ethiopia. 2016: p. 45.
25. Campbell MJ, Walters SJ. How to Design, Analyse and Report Cluster Randomised Trials in Medicine and Health Related Research. Sheffield: John Wiley and Sons,Ltd; 2014.
26. Afework B, Alemayehu M, Znabu H, Araya AM, Mohammed A, Afework M. Factors influencing contraceptive use among women of reproductive age from the pastoralist communities of Afar, Ethiopia: a community-based cross-sectional study. *Ethiop J Health Dev.* 2018;32(Special Issue):28–33.
27. Jemal, Yousuf, et al, Maternal health beliefs, attitudes and practices among Ethiopian Afar,2011.
28. Fishbein M, Ajzen I. Predicting and changing behavior: The reasoned action approach. New York: Psychology Press; 2010.

29. BT S, SK A. A M. Family planning and contraception in Islamic countries: a critical review of the literature. *J Pak Med Assoc*2013;63(4).
30. Campbell MJ, Walters SJ. *How to Design, Analyse and Report Cluster Randomised Trials in Medicine and Health Related Research*. The Atrium, Southern Gate, Chichester, West Sussex, PO19 8SQ. United Kingdom: Willey; 2014.
31. Hayes RJ, Moulton LH, *Cluster randomised trials*, ed. B.J.T.M. N. Keiding, Wikle CK. P. van der Heijden2009.
32. Hernandez J, Akilimali P, Muanda M, Glover A, Bertrand J. Evolution of a large-scale community-based contraceptive distribution program in Kinshasa, DRC based on process evaluation *Glob. Health Sci Pract*. 2018;6(4):10.
33. H A HN, G.M H RF, ul Haq m AY, et al. Community-based integrated approach to changing women's family planning behaviour in Pakistan, 2014–2016. *Public Health Action*2018;8(2)(≤ <http://dx.doi.org/10.5588/pha.17.0097>)>.
34. Doyle K, Levtov RG, Barker G, Bastian GG, Bingenheimer. JB, Kazimbaya S, et al. Gender transformative Bandedereho couples' intervention to promote male engagement in reproductive and maternal health and violence prevention in Rwanda: Findings from a randomized controlled trial. *PLoS ONE*:201813(4):e0192756. <https://doi.org/10.1371/journal.pone.0192756>.
35. Raj A, et al. Cluster Randomized Controlled Trial Evaluation of a Gender Equity and Family Planning Intervention for Married Men and Couples in Rural India. *PLOS One*. 2016;May 11(5):20., ,. **11**.
36. Ha BTT, Jayasuriya R, Owen N. Increasing male involvement in family planning decision making: trial of a social-cognitive intervention in rural Vietnam. *HEALTH EDUCATION RESEARCH:Theory Practice*. 2005;20(5):548–56.
37. Vouking MZ, Evina CD, Tadenfok CN. Male involvement in family planning decision making in sub-Saharan Africa- what the evidence suggests.. *Pan African Medical Journal*:2014;19(349).
38. Ergano K. Getachew M, Seyum D, Negash K. Determinants of community based maternal health care service utilization in South Omo pastoral areas of Ethiopia. *Journal of Medicine Medical Sciences*. 2012;3(2):112–21.
39. USAID Health Policy Initiative. *The contribution of family planning, achieving MDGs in Ethiopia*. Ethiopia, 2009.
40. Doumbia RKatzKGWestC, Kane F. F. Increasing access to family planning services in rural Mali through community-based distribution. *International Family Planning Perspectives*. 1998;24(3):6.
41. Schwandt HM, Creanga AA, Danso KA, Adanu RM, Agbenyega T, Hindin MJ. Group versus individual family planning counseling in Ghana: a randomized, noninferiority trial. *Contraception*2013;88: 281–288.
42. Terefe A, Larson CP. Modern contraception use in Ethiopia: does involving husbands make a difference? *Am. J Public Health*. 1993;83:1567–71.
43. Akman M, Tuzun S, Uzuner A, Basgul A, Kavak Z. The influence of prenatal counselling on postpartum contraceptive choice. *J Int Med Res*2010;38: 1243–1249.
44. Saeed GA, Fakhar S, Rahim F, Tabassum S. Change in trend of contraceptive uptake-effect of educational leaflets and counseling. *Contraception*: 2008;77: 377–381.

Tables

Table 1:- Before and after the provision of the intervention information per women's education on FP, and male involvement in FP education, and control arm among Pastoralist married women Afar, 2019

Variables	Arms					
	Control		Women's education in FP		Male involvement in FP education	
	Baseline data	End line data	Baseline data	End line data	Baseline data	End line data
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
No of women	297	297	297	297	297	297
Mean (SD) age (years)	25.3(6.49)	26.9(6.72)	26.3(6.84)	26.4(6.75)	25.9(6.42)	26.8(6.10)
Heard of FP	252(84.8)	240(80.8)	265(89.2)	265(89)	269(90.6)	279(93.9)
Use of FP	7(2.35)	13(4.3)	14(4.71)	52(17.5)	17(5.72)	102(34.3)

Table-2: - Cluster level numbers and proportions of pastoralist mothers reporting yes to overall FP use in women's FP education, male involvement in FP education and control arms following the intervention, Afar, Ethiopia, 2019

Clusters	Arms								
	Control (m=11 clusters)			Women education on FP education (m=11 clusters)			Male involvement in FP education (m=11 clusters)		
	Cluster size	# in clusters reporting yes	Cluster proportion reporting yes	Cluster size	# in clusters reporting yes	Cluster proportion reporting yes	Cluster size	# in clusters reporting yes	Cluster proportion reporting yes
1	27	1	0.04						
2	27	1	0.04						
3	27	2	0.07						
4	27	2	0.07						
5	27	0	0.00						
6	27	2	0.07						
7	27	1	0.04						
8	27	2	0.07						
9	27	2	0.07						
10	27	0	0.00						
11	27	0	0.00						
12				27	6	0.22			
13				27	4	0.15			
14				27	5	0.19			
15				27	7	0.26			
16				27	5	0.19			
17				27	7	0.26			
18				27	2	0.07			
19				27	5	0.19			
20				27	4	0.15			
21				27	4	0.15			
22				27	3	0.11			
23							27	10	0.37
24							27	11	0.41
25							27	13	0.48
26							27	9	0.33
27							27	14	0.52
28							27	9	0.33
29							27	7	0.26
30							27	8	0.30

31							27	6	0.22
32							27	7	0.26
33							27	8	0.30
Totals	297	13	0.48	297	52	1.93	297	102	3.78
Mean (SD)			0.043(0.03)				0.175(0.05)		0.343(0.09)

Table 3: Absolute number of FP users and prevalence ratio in the baseline and end-line per arms Afar, Ethiopia, 2019

Variable	Group per the absolute number of FP users		
	Control	Women's education on FP	Male involvement in FP education
Baseline data on FP use	7	14	17
End line data on FP use	13	52	102
Prevalence ratio (end line/baseline data) on FP use	1.8	3.7	6

Table 4: -Description of FP users by selected variables per arms in Afar, Ethiopia,2019

Variables	Category	Arms		
		Control	Women's education on FP	Male involvement in FP education
		Use of FP	Use of FP	Use of FP
		n (%)	n (%)	n (%)
Community responsibility of respondent's husband	Religious leader	0(0.0)	3(5.8)	9(8.8)
	Clan leader	3(23.1)	5(9.6)	10(9.8)
	Faema leader*	1(7.7)	5(9.6)	17(5.7)
Type of current FP use	Pill	1(7.7)	4(7.7)	6(5.9)
	Depo-Provera	8(61.5)	45(86.5)	87(85.3)
	Implanon	2(15.4)	2(3.8)	8(7.8)
	Others **	2(14.4)	1(1.9)	1(1)
Husband know for using of FP	Yes	5(38.4)	39(75)	88(86.3)
Get support from husband for use of FP	Yes	4(80)	39(100)	86(97.7)
Type of support from husband on FP use	Accompany to a health facility	2(50)	26(66.7)	66(76.7)
	Reminding the schedule	1(25)	33(84.6)	81(94.2)
	Participate in choosing the type of FP	1(25)	21(53.8)	62(72.1)
	Helping in domestic activity	2(50)	26(66.7)	64(74.4)

*Applicable for both married women and men; **Condom, Jadelle.

Table 5: Estimated independent t-test coefficients to show the effect of male involvement in FP education, women's education on FP versus control arm on FP use, Afar 2019.

Outcome	Mean Value		t-test	df	P-value	Absolute Risk	95% CI	
	Intervention	Control					Lower	Upper
FP use								
Male involvement in FP education	0.34	0.043	10.01	12.3	0.0000002*	0.29	0.23	0.34
Women's education on FP	0.17	0.043	6.59	15.7	0.000006*	0.13	0.08	0.17
Intention to use of FP								
Male involvement in FP education	1.59	1.29	5.14	19.7	0.00005*	0.3	0.17	0.42
Women's education on FP	1.47	1.29	2.52	19.1	0.02*	0.18	0.03	0.31

*significant at p-value <0.05

Figures

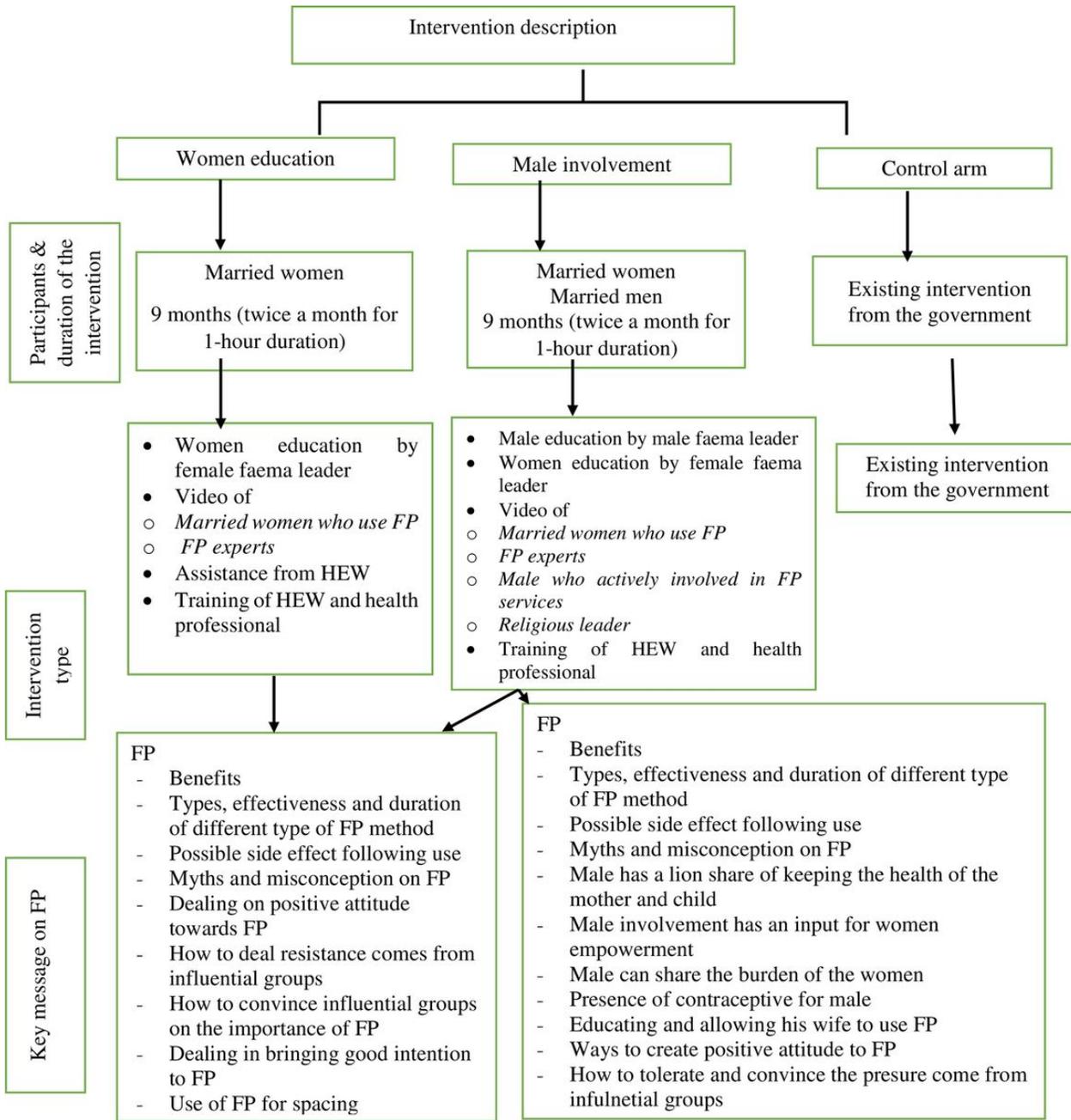


Figure 1

Type of family planning education per arms among pastoralist community Afar region, Ethiopia, 2019

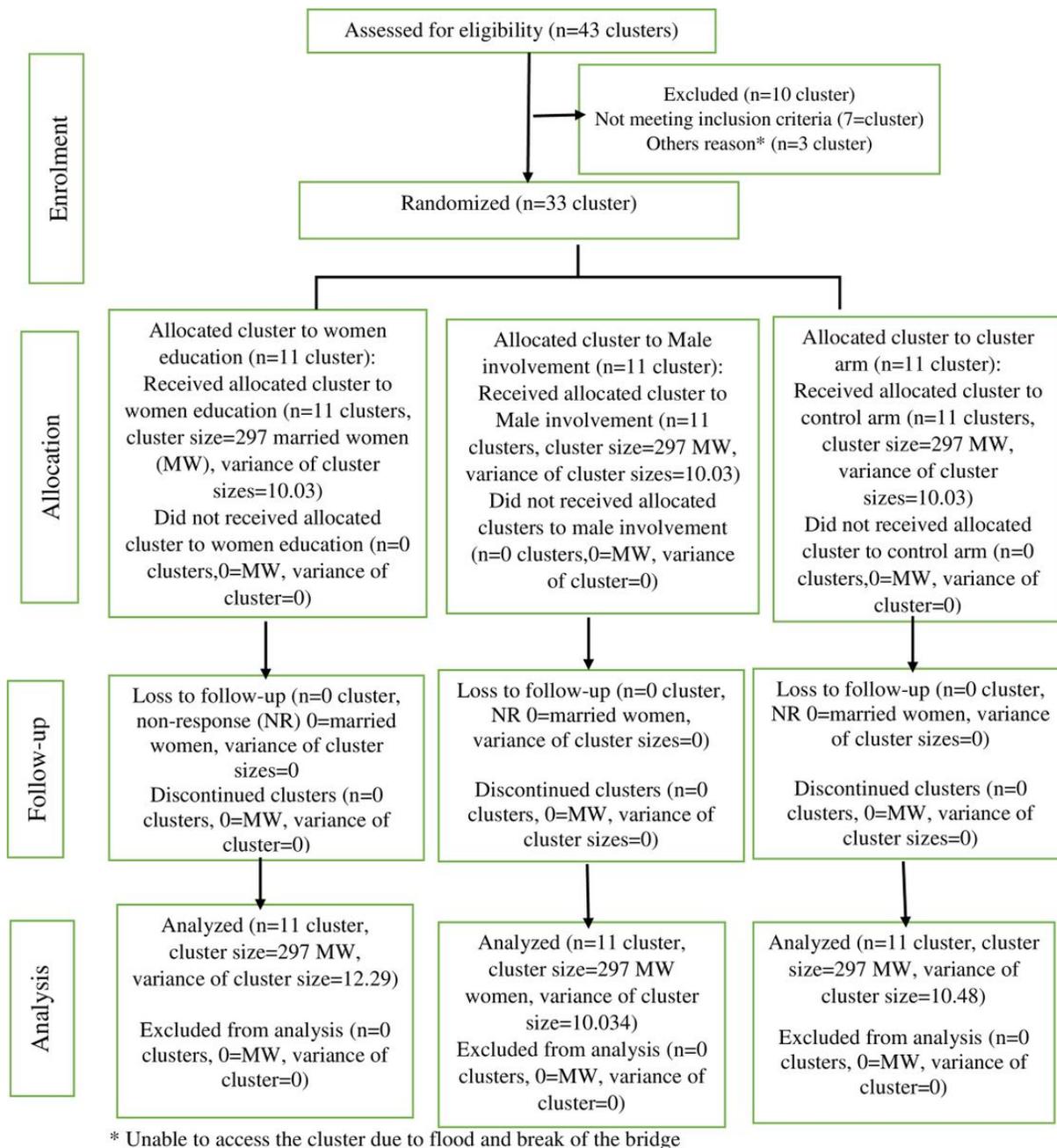


Figure 2

Participants and cluster flow of the trial among pastoralist community Afar region, Ethiopia, 2019

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [AdditionalFile1.docx](#)
- [CONSORTChecklistofthetrial.doc](#)