

Sustainability of Yam Daabo Interventions' Effects on Contraception use in Burkina Faso 12 Months after the end of Interventions

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Research Article

Keywords: family planning, interventions, use, sustainability, impact, postpartum

Posted Date: December 28th, 2020

DOI: <https://doi.org/10.21203/rs.3.rs-113062/v1>

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Abstract

Introduction

After testing the interventions for improving the prevalence of contraceptive use, very few studies have measured the sustainability of the effects achieved during implementation. This study aimed to measure the sustainability of Yam Daabo interventions' effects on contraceptive use in Burkina Faso twelve months after these interventions were completed.

Methods

Yam Daabo was a two-group, multi-intervention, single-blind, cluster randomized controlled trial. Interventions comprised refresher training for the provider, a counseling tool, supportive supervision, availability of contraceptive services 7 days a week, client appointment cards, and invitation letters for partners. We used generalized linear mixed-effects models (log Poisson) to compare the modern contraceptive prevalence at 24 months in the intervention and control groups. We collected data between September and November 2018. We conducted an intention-to-treat analysis and adjusted the prevalence ratios on cluster effects and unbalanced baseline characteristics.

Results

Twelve months after the completion of the Yam Daabo trial, we interviewed 84.9% (485 out of 571 women) of the women included at Yam Daabo starting, that is, 247/286 in the intervention group (86.4%) and 238/285 in the control group (83.5%). No difference was observed in the use of hormonal contraceptive methods between the intervention and control groups (adjusted prevalence ratio=1.21; 95% confidence interval [CI] = [0.91–1.61], $p=0.191$). By contrast, women in the intervention group were more likely to use long acting reversible contraceptives (LARC) than those in the control group (adjusted prevalence ratio =1.35; 95% CI = [1.08–1.69], $p=0.008$).

Conclusion

This study showed that women in the intervention group preferred to use long-acting reversible contraceptives even though no significant difference was found in the comparison of modern contraceptive prevalences between the two arms.

Trial registration

The trial registration number at the Pan African Clinical Trials Registry is PACTR201609001784334 and the date of the first registration is 27/09/2016.

Introduction

Many authors have tested several interventions to improve the prevalence of contraceptive use [1, 2]. In 2015, we tested a package of interventions in two African countries, Burkina Faso (BF) and the Democratic Republic of the Congo (DRC), in a randomized cluster trial design called Yam Daabo [3, 4]. The PFP intervention package had two types of interventions. The first one comprised three facility-oriented interventions: refresher training of service providers, regularly scheduled and strengthened supportive supervision of providers, enhanced availability of services 7 days a week. The second had three individual-based interventions: a PFP counseling tool, appointment cards for women, and invitation letters for partners. The conception of the new counseling tool takes into account all new World Health Organization [WHO] recommendations on family planning service provision. The package was designed through participatory action research, and the process and contents are detailed elsewhere [4]. After 12 months of follow-up (which marks the end of the interventions), the main results showed a significant increase in the use of appropriate modern contraceptive methods among women receiving the interventions compared to women not receiving the interventions. In BF, at 12 months, the modern contraceptive prevalence rate was 55% among women in the intervention group and 29% among women in the control group (adjusted prevalence ratio [PR]: 1.79, 95% CI = 1.30–2.47) [5]. In the DRC, at 12 months, 46% of the women in the intervention group and 35% of the women in the control group were using modern contraceptives (adjusted PR: 1.58, 95% CI = 0.74–3.38), with significant differences in the use of contraceptive implants (22% vs. 6%; adjusted PR: 4.36, 95% CI = 1.96–9.70) [6].

However, many questions remain unanswered a few months after these types of interventions because most studies examine the effects of interventions immediately after the interventions' completion. So, very few studies have measured the sustainability of the effects of interventions that were effective after they were discontinued. A systematic review conducted in 2016 by Iwelunmor et al. [7], found studies on infectious diseases (human immunodeficiency virus/acquired immunodeficiency syndrome and malaria). However, a few studies measured the effects of family planning interventions a few months or years after they were discontinued in Nigeria (involving community-based interventions) [8–10].

As three (out of six) of Yam Daabo's interventions were individual-based, we hypothesized that (i) health workers could continue to offer some elements of the intervention package to women visiting the health centers, (ii) the effects may persist even after the interventions were stopped as women will receive counseling several times (during and after the first year postpartum), (iii) women in the intervention group not using the methods at the end of the interventions because of past and current exposures may start using contraceptive methods one year after giving birth. We hypothesize that appropriate contraceptive methods use would remain high within 24 months among women in the intervention group compared to those in the control group. Therefore, this study aimed to measure the effects of the Yam Daabo trial interventions on contraceptive methods use in BF, 12 months after the end of the interventions, corresponding to 24 months postpartum.

Methods

We conducted a complex, multicentre, randomized cluster trial called Yam Daabo in primary health centers in the Yako health district (Centre-North region, BF).

BF is a sub-Saharan African country, with an estimated population of 20,321,000 in 2019 [11]. According to Blumenberg et al., the modern contraceptive prevalence rate (M CPR) was 31.9% in December 2018, based on the analysis of Performance Monitoring and Accountability 2020 (PMA2020) data [12]. Ahmed et al., using the FP 2020 data, reported an estimated unmet need for modern contraception of 27.2% in 2017 [13]. As in most countries in sub-Saharan Africa, cultural norms favor large families, with higher fertility rates in rural areas than in urban areas. In 2019, BF had 5.6 live births per woman [11].

Description of the Yam Daabo trial:

This study involved two countries: BF and the DRC. The project was implemented in several successive phases: pre-formative phase, formative phase, and intervention phase. We randomized each country's health centers into two groups during the intervention phase: intervention and control. The health centers in the experimental group offered six PFP interventions that were identified as solutions to the barriers identified during the formative phase of the project and are already described in another article [4]. The health centers in the control group offered the usual PFP care. We included and followed women at the third trimester of their pregnancy over 12 months after delivery. As said above, Yam Daabo's interventions comprised refresher training for the provider, counseling tool, supportive supervision, availability of contraceptive services 7 days a week, client appointment cards, and invitation letters for partners. Participants received individual-based interventions during their pregnancy and during the postpartum period, according to national practice (typically on clinical discharge [24 – 48 h], at 6 days, 6 weeks, then at months 6 and 9, before the trial exit at month 12 postpartum). The study was statistically powered to detect a difference of 15 percentage points between the experimental and control groups in the proportion of women adopting an effective method of PFP at 6 months postpartum. Considering the intra-cluster correlation coefficient, in each country, each study group had to have 4 health centers with at least 60 participants per centre to have a statistical power of 93% at a significance level of 5%. As this study had an estimated loss to follow-up rate of 10%, each center had to recruit at least 70 pregnant women. This value was equivalent to a cohort of 280 pregnant women in each group (4 centers × 70 participants) and a total of 560 participants per study and country (280 participants × 2 study groups). All pregnant women were eligible to participate in the study if (1) they were in their third pregnancy trimester; (2) the status of the pregnancy and the woman allowed for a birth at the health center; (3) the woman had the intention to attend ANC, delivery, and PNC at the health center; (4) the woman did not participate in another study; and (5) we obtained informed consent. Research assistants collected data on paper-based case report forms (CRFs). The WHO team in Geneva developed the CRFs with inputs from the country's research teams. Each health center of the cluster RCT had a research assistant who was trained to adhere to the study manual and standard operating procedures for data management, which are common to both study countries and have been developed by WHO. The information reported on the CRFs was checked for accuracy and completeness several times at different levels by field coordinators

and data managers. The Biostatistics and Data Management team at HRP developed the eCRF through OpenClinica (version 3.11), an electronic data capture software for clinical research. This software allowed checks for data accuracy, completeness, and consistency, reducing data queries, and problem resolution delays. In each country, the eight sites were matched by pairs according (1) the average number of deliveries per month, (2) the ratio of health workers per population, and (3) the settings (rural, urban). Within each pair, we randomly selected the site assigned to the experimental intervention. This randomization was done four times. No restriction in the randomization process was required. All consecutive and eligible participants were included in the clusters. Due to the nature of the interventions, participants, health staff, research assistants assigned to each centre, and the rest of the research team members could not be masked to the cluster assignments. Methodological details on the Yam Daabo are available in the published protocol [3].

The trial was approved by the WHO Ethics Committee and the Health Research Ethics Committee of BF and has been registered in the Pan-African Clinical Trials Registry (registration number: PACTR201609001784334 on 27/09/2016).

No interim analysis was conducted during this study. At the end of the 12-month follow-up, analyses on contraceptive use at each of the contact points (day 6, week 6, month 6, and month 12) were conducted. These results for BF and the DRC have already been published [5, 6].

The time from enrolment to exit interview at 24 months postpartum spanned from July 27, 2016, to November 15, 2018.

Type of study

We conducted a randomized, clustered, controlled trial extending the follow-up of women to 24 months (12 months after the end of the interventions).

Population

we included in this study all postpartum women who participated in the Yam Daabo trial.

Additional collection period

we collected data from September 15, 2018, to November 15, 2018.

Key measures

The primary outcome of this study was the contraceptive method use. We used the classification adopted by the WHO in 2015 [14]. Thus, for this analysis, the groups of methods were defined as follows

- Long-acting reversible contraceptive, including implants and intrauterine devices
- Short-acting contraceptive methods, including injectables, pills, emergency contraception, male and female condoms
- Permanent methods (male and female sterilization)
- The lactational amenorrhea method

Next, we also classified the contraceptive methods into "modern and appropriate methods" and "non-modern or inappropriate methods." The non-modern methods comprised traditional methods, withdrawal, and abstinence. Inappropriate methods include lactational amenorrhea (if used after 6 months) and calendar-based methods (if used during the first 12 months postpartum).

The main dependent variable was exposure to interventions, defined as the binary variable (coded 1 for the intervention group and 0 for the control group).

Moreover, we measured the frequency of pregnancies in both groups of women.

Data collection at 24 months postpartum

five interviewers collected the data (They were part of the interviewing team that collected follow-up data up to 12 months postpartum). To locate the target participants, they used the women's identification documents, which contained their telephone numbers. Maternity health workers and community-based health workers provided valuable assistance in the search for women. They conducted interviews mainly in health centers and women's homes or other secure public places chosen by the woman beforehand. Data on contraception use were extracted into the health centers registers.

Data processing and statistical analysis

EpiData and Stata 15.1 software were used for data entry and analysis, respectively. To ensure the comparability of results with published data on intervention effectiveness at 12 months postpartum, we used generalized linear mixed-effects (log Poisson) models were used to measure the effects of interventions on contraceptive use with a significance threshold of 5%. We adjusted the measure of association on sociodemographic variables unequally distributed between the intervention and control

groups, at inclusion. We also corrected for a possible cluster effect by taking into account any correlation that might exist.

We followed Consolidated Standards of Reporting Trials extension for pragmatic trials guidelines to write the manuscript (supplementary file 1).

Ethical considerations

The study protocol was approved by the Health Research Ethics Committee of BF. Participants' data were anonymized, and informed consent was obtained from all women prior to data collection.

Results

Twelve months after the end of the Yam Daabo interventions, we found that 485 (87.4%) of 555 women used contraceptive methods. The lost to follow-up rates were 13.6% in the intervention group (247 of 286 women included) and 16.5% in the control group (238 of 285 women included). The flow diagram, presented in Fig. 1, summarizes this information. However, no statistical difference was observed in the lost to follow-up rates between the two groups ($p = 0.332$).

The chi-square test comparing women's sociodemographic and gynecological characteristics at baseline showed no significant difference in any of the variables except the total number of abortions ($p = 0.01$). These data are presented in Table 1.

Table 1
baseline characteristics of women who were interviewed at 24-month postpartum
(inclusion data)

	Intervention n = 238 n(%)	Control n = 247 n(%)
Women's age		
Under 20	31(13.0)	46(18.6)
20–29	123(51.7)	133(53.8)
30 and more	84(35.3)	68(27.5)
Number of pregnancies		
None	36(15.1)	47(19.0)
1–3	106(44.5)	123(49.8)
4–6	77(32.4)	63(25.5)
≥ 7	19(8.0)	14(5.7)
Number of living children		
None	42(17.6)	53(21.5)
1–3	121(50.8)	131(53.0)
≥ 4	75(31.5)	63(25.5)
Number of previous live births		
None	42(17.6)	49(19.8)
1–3	112(47.1)	126(51.0)
≥ 4	84(35.3)	72(29.1)
Number of stillbirths		
None	224(94.1)	222(89.9)
≥ 1 stillbirth	14(5.9)	25(10.1)
Number of abortion*		
None	206(86.6)	231(93.5)
≥ 1 abortion	32(13.4)	16(6.5)
Education status		

* : significant difference (p = 0,01)

	Intervention n = 238	Control n = 247
	n(%)	n(%)
No education	163(68.5)	174(70.4)
Primary school	35(14.7)	36(14.6)
Secondary/Tertiary	40(16.8)	37(15.0)
Marital status		
Not in union	2(0.8)	4(1.6)
In union	236(99.2)	243(98.4)
Occupation		
No occupation	1(0.4)	0(0.0)
Student	24(10.1)	19(7.7)
Housewife/Farmer	185(77.7)	201(81.4)
Salaried employee	2(0.8)	5(2.0)
Tradeswoman	26(10.9)	22(8.9)
Family planning use prior to the trial		
No	161(67.6)	178(72.1)
Yes	77(32.4)	69(27.9)
Current pregnancy planned		
Yes	115(48.3)	113(45.7)
No	123(51.7)	134(54.3)
* : significant difference (p = 0,01)		

Results showed that women in the intervention group had a higher prevalence of modern contraceptive use than those in the control group at 24 months postpartum (58.0% vs. 47.4%; Adjusted PR = 1.21; 95% CI = 0.91–1.61, p = 0.191), but this difference was not statistically significant. The use of LARC was higher among women in the intervention group than in those in the control group with a statistically significant difference (37.4% vs. 27.5%; Adjusted PR = 1.35; 95% CI = 1.08–1.69, p = 0.008). No significant difference was noted in the use of short-acting methods (20.6% vs. 19.8%; Adjusted PR = 1.00, 95% CI = 0.55–1.81, p = 0.992). Among the non-modern or inappropriate methods, only one woman was using the standard days' method. None of the women used a permanent method (vasectomy or tubal ligation) at 24 months postpartum. Table 2 expressed these results.

Table 2
contraception use at 24-month

	Intervention group n/N	Control group n/N	p	Adjusted prevalence ratio (95%CI)
Modern and appropriate methods	138/238 (58.0%)	117/247 (47.4%)	0.191	1.21 (0.91–1.61)
Long-acting methods	89/238 (37.4%)	68/247 (27.5%)	0.007	1.35 (1.08–1.69)
Short-acting methods	49/238 (20.6%)	49/247 (19.8%)	0.992	1.00 (0.55–1.81)
Non-modern or non-appropriate methods	1/238 (0.4%)	0/247 (0%)	–	–
No contraceptive method	100/238 (42%)	130/247 (53%)	0.224	0.8 (0.56–1.15)

Concerning the frequency of pregnancies, we noted no significant difference between women in the intervention and control groups (21 out of 238 pregnant women in the intervention group versus 23 out of 247 in the control group, 8.8% and 9.3%, respectively).

Discussion

This analysis has two main findings. First, Yam Daabo trial interventions' effects on modern family planning use persisted 12 months after the interventions ended, but no statistically significant difference was noted between the experimental and control groups. Second, a statistically significant difference was noted in its effects on LARC use.

Some authors, including Tu et al. [15], Speizer et al. [8, 9], Subramanian et al. [16], and Jejeebhoy et al. [17], after evaluating the sustainability of the effects of certain interventions related to contraceptives' provision several months after the cessation of interventions noted that the results varied in terms of the intensity of the sustainability of the effects. Indeed, in Shanghai, Tu et al. noted a significant difference in contraceptive method use and reported a higher contraceptive use in the group of young people who benefited from the interventions 28 months after the cessation of interventions [15]. Subramanian et al. [16] and Jejeebhoy et al. [17] reported the persistence of effects 4 to 8 years after the end of the PRACHAR project, implemented between 2001 and 2012 in Bihar (India), on contraceptive use among young married couples. Speizer et al. noted the persistent effects of a community-based program on contraceptive use in two cities where the program had been implemented [8] and a change in the effects of the same program on the quality of family planning services after the program ended [9]. The interventions' nature can explain Yam Daabo interventions sustainability effects (significant difference in the use of LARC) with three individual-based rather than community-based. One could be led to believe that the skills women learned during the implementation phase of the interventions guided them for

12 months after the interventions' completion. This is a cause for satisfaction because the cessation of the interventions coincided with the end of repeated contact period between postpartum women and health workers. In Burkina Faso's context, these contacts are limited to 12 months postpartum.

The non-significant difference at 24-month in modern contraceptive use between the experimental and control groups could be explained by the effects of two campaigns of free contraceptive methods' distribution since the last follow-up. These two campaigns were conducted in all public health facilities (7 days each, including one campaign in November and another one in June each year). Compared with the results published at 12 months, this non-significant difference in the modern contraceptive prevalence can be explained by the increased contraceptive use in the control group (29% at 12 months [5] vs. 47.4% at 24 months). This net increase in the control group could be related to the effects of the national family planning week, which is celebrated every June and November and covers all regions of BF, during which contraceptives are provided free of charge. Such a campaign for free contraceptive methods could therefore have more effect in the control group (which included women who used the methods less) than in the intervention group since there was a 55% use rate at 12 months [5]. It could be argued that because of the higher proportion of unmet needs in the control group, it is easier to register new users as soon as free distribution campaigns take place. Current data on the modern contraceptive prevalence in the general population could help us better comprehend this rate's evolution in the control group. Thus, if contraceptive methods were free, women would use more modern methods. In the Burkinabe context, the implementation of the interventions tested in this study, combined with the free distribution of contraceptive products (already ongoing in Burkina since 2019 in some regions and since 2020 throughout the country), could allow the widespread use of modern contraceptive methods.

Our study had several limitations. First, the proportion of people who were lost to follow-up was slightly high. However, this did not affect our results' internal validity in terms of power since the initial hypothesis was that 60 women per health center, 480 women in total, should be included to achieve the minimum desired power [3]. However, we selected and surveyed 485 women. Another limitation was that we had no contact with the women 12 months after the study. As a result, the participants may have forgotten several episodes.

Conclusion

This study showed that the effects of interventions in improving contraceptive use can be sustained for up to 12 months after the interventions are completed. Indeed, women continued to use appropriate contraceptive methods and LARC 12 months after the interventions were discontinued. The modern contraceptive prevalence of the intervention group may have important implications in BF. Indeed, if Yam Daabo's realistic interventions are implemented and combined with free contraceptive methods, nearly 3 out of 5 women will still be using modern contraceptive methods at 24 months. This result is more significant as contraceptive methods have been provided free of charge in BF's public health facilities since 2020.

Declarations

Ethics approval and consent to participate

The study protocol was approved by the Health Research Ethics Committee of Burkina Faso. Participants' data were anonymized, and informed consent was obtained from all women prior to the 24 months postpartum data collection. It has been registered in the Pan-African Clinical Trials Registry (registration number: PACTR201609001784334, registered on 27/09/2016).

Statement on the inclusion of minor participants

In the case of minor participants, informed consent of the parent or the respective legal guardian was obtained in conjunction with informed assent of the underage participant (less than 18 years of age).

Statement on all the procedures in this research

All methods were carried out in accordance with relevant guidelines and regulations.

Consent for publication

Not applicable

Availability of data and materials

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Competing interests

The authors declare that they have no competing interests

Funding

The Government of France funded Yam Daabo through the Muskoka Funds and the 24-month data collection was carried out with the World Health Organization's financial support. The study funder (Government of France or World Health Organization) had no role in study design, data collection, data analysis, data interpretation, or writing this article.

Authors' contributions

AC participated in all phases of the project: from design to data collection. He analyzed the data for this article and wrote the first draft with the important contributions from AB, FG, TM, NTT, BM, WMEY, BT, and SK. TM, NTT, MWEY, BT and SK were members of Yam Daabo's research team. SK was the principal investigator of the project in BF and is the supervisor for this thesis. All authors contributed to revising the paper and agreed to be accountable for all aspects of the work.

Acknowledgments

This work was carried out as part of the epidemiology thesis of the corresponding author. Special thanks go to the World Health Organization for offering the scholarship of doctoral studies in epidemiology. We also thank the biomedical and public health department of the Research Institute of health sciences.

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Figures

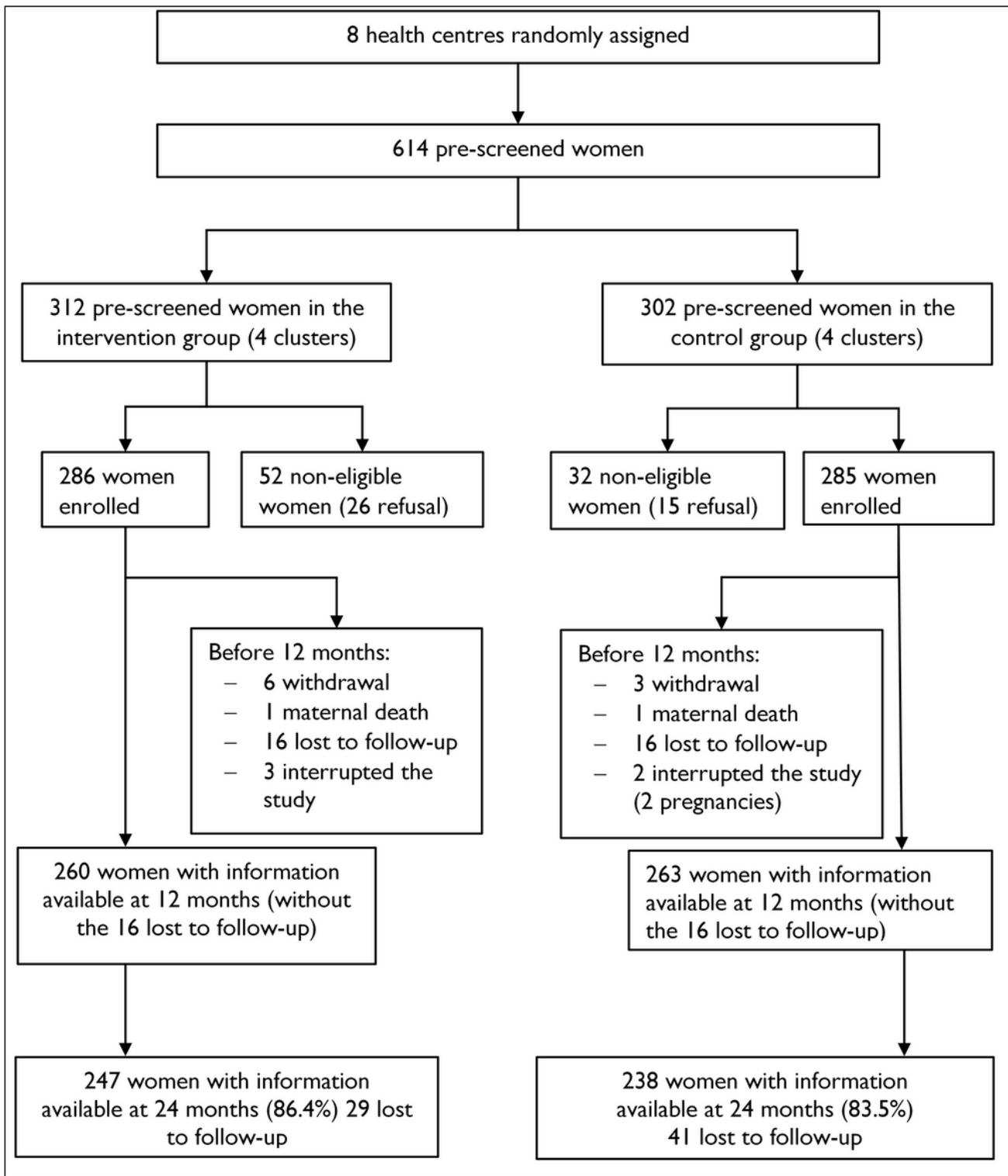


Figure 1

flow diagram

Supplementary Files

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