

Title: Effectiveness of a Family Planning Education Program on Contraceptive Utilization among Women in Sudan- a Quasi Experimental Study

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Abstract

Background: While family planning services play a crucial role in preserving maternal health and mitigating maternal mortality rates, Sudan, despite its integration into the primary healthcare system since 1985, continues to grapple with elevated maternal mortality rates, coupled with persistently low utilization rates. **Aim of the study:** The purpose of this study was designed to assess the impact of a family planning education program on contraceptive utilization rate among women in Sudan. **Methodology:** A quasi experimental study was used to achieve the aim of the study. Cluster sample technique was used to involve 456 reproductive-age women. This study was carried out in two local area at Khartoum north locality in Khartoum state (Aldaroshab and Alkadro area). Aldaroshab Area was randomly selected to act as the intervention group. Alkadro Area was acted as a control group, data was collected using a questionnaire consisting of 30 questions covering different aspects of family planning. Participants were divided into experimental and control groups, and pre-and post-tests were conducted to determine the utilization rate, the data were entered into SPSS version 23 for analysis, p-value <0.05. **Results:** The study found significant increase in the level of utilization rate of the studied population regarding family planning after attendance of the educational program. The use of the participants family planning methods was 114(50%) of them at pre intervention measurement and by 190(83.3%) at post intervention measurement. ($P = 0.001 < 0.05$). The utilization of natural methods, contraceptive pills, and injectable methods has significantly increased from (5.2%, 26.2% and 5.3%) to (15.4%, 34.2% and 15.8%) respectively. **Conclusions:** The study concludes that a family planning education program significantly increases the level of contraceptive utilization rate in Sudan. **Recommendation:** Simplification and maximum utilization of the family planning health education programs

Keywords: Family planning, Utilization rate, Education program, Knowledge.

Introduction

Family planning is the process by which individuals or couples utilize contraceptive methods to determine how many children they want and how long to wait between them. Numerous affordable methods of contraception offer significant advantages for human rights and health (Cleland et al., 2006). In countries with high birth rates, family planning promotion has the power to prevent 32% of all

maternal deaths, almost 10% of child deaths, poverty and hunger. Additionally, it would make a significant contribution to long-term environmental sustainability, universal primary schooling, and women's empowerment (Ezeh et al., 2012).

Family planning programmes have played a major role in increase the prevalence of contraceptive use from less 10% to 60% and lowering fertility in poor countries from six to

three births per woman over the past 40 years (**Bongaarts and Hardee, 2019**). However, even though a variety of contraceptive methods are available, utilization rate still low in many countries, especially in low and middle-income countries (**Mutumba et al., 2018**).

Indicators of sexual and reproductive health are poor in Sudan. The maternal mortality rate is estimated at 360 maternal deaths per 100,000 live births and has only decreased by 50 % over last three decades (**World Health Organization, 2023**).

There were 1.9 billion women of reproductive age in the world in 2019. Around 923 million of them were using either traditional or modern methods of family planning. Ten percent of women globally are disabled, and 75 percent of them reside in low- and middle-income countries (**World Health Organization, 2011**). One possible strategy for improving the uptake of contraception is through community-based education programs. Such programs have been shown to be effective in increasing knowledge of family planning methods and improving contraceptive use among women in various settings (**Yiatyal et al., 2014 and Masiano et al., 2019**).

Family planning is a preventive measure that can lower the maternal death, according to a recent analysis from 72 countries (**Ahmed et al., 2012**). However, a study conducted in Sudan found that innovative contraceptive methods are high in White Nile state in Sudan and the key significant associated factors of modern contraceptive utilization and use were found. Main obstacles was none financial support and among non-user was religious beliefs (**Abdalla and Ahmed, 2017**)

In Eastern Sudan, women with less than a secondary education had a much higher unmet demand for family planning. Also; it is impacted by couple's educational level and occupation of the women. Also showed that the importance of need for the programme managers to consider the concept of reproductive health education (**Ali and Okud, 2013**)

A cluster randomized controlled trial was conducted in Khartoum, Sudan, over one year an modern contraceptive intervention program was used as intervention and showed that the

utilization rate of contraceptive methods significantly increase from 37% to 59% (**Ahamed, 2016**)

Additionally, studies show that the main causes of non-use of family planning in eastern Sudan were husband resistance and religious beliefs so recommended that encouragement of health education programs and involvement of the religious leaders might promote family planning in Sudan (**Ali et al., 2011**).

Significance of the study

Family planning practice is determined by many factors that can be considered

Obstacles to the use of family planning services then emphasized the cultural imperatives of African communities that are important in maintaining high levels of fertility . In many African cultures it is taboo to be childless. Therefore, high fertility enjoys acceptance and approval from various community groups and religious leaders. A woman's age, residence (urban or rural), education and income may have substantial effects on contraceptive use and are likely to affect how women choose family planning services (**Bongaarts and Hardee, 2019**). Previous studies have clearly evidenced that knowledge about family planning among married Sudanese women is far from being universal. The main limiting factors to the utilization of family planning methods in Sudan are poverty, ignorance, and illiteracy (**Ali and Okud, 2013**).

Aim of the study:

The purpose of this study was designed to assess the impact of a family planning education program on contraceptive utilization rate among women in Sudan.

Objective

The purpose of this study was designed to assess the impact of a family planning education program on contraceptive utilization rate in Sudan.

Hypothesis

The utilization rate of women will be higher after an intervention health education program than before.

Methods

Study Design, Period

A quasi-experimental study design was conducted during the period from December 2022 to June 2023

Study population:

The study population consisted of married in reproductive age (ages between 20 and 50) residing in Khartoum North, Sudan.

Inclusion Criteria All mothers in the study areas who are in age (20-50) years. Exclusion criteria Married women who are infertile or out of age (20-50) years.

Sample technique & sample size:

Cluster sample technique was used to involve 500 women

The area of the study was composed from 33 blocks. The researchers randomly selected 10 blocks. The total number of women who fulfil the inclusion criteria was 456. The total number was randomly distributed to case and control group, 228 women in each group

Using a computerized method with a 95% confidence level, the study sample was chosen from two search regions via the Roasoft website. The study's sample size was calculated to be 456 participants, and 500 women were chosen by the researcher to allow for any possible study dropouts. There were two groups of participants: the control group (n=250) and the intervention group (n=250). By drawing lots, one of the two regions was randomly chosen for the intervention and the other for the control as part of the sampling technique, the sample was selected from 33 blocks, with five blocks randomly chosen from each region by drawing lots. A total of 50 mothers were selected from each block.

Data Collection:

Quantitative data were collected using a questionnaire designed by the researchers to measure utilization rate of mothers in both groups. The questionnaire was administered before the start of the program and after 6 months at the end of the study. The questionnaire consisted of 30 questions covering different aspects of family planning knowledge and estimate utilization rate.

Time offered was 10-15 minutes for each participant, (carried out by the researcher and researcher assistant).

The questionnaire included the following sections:

-Section one Socio-demographic data: including Sex, Age, Educational level, and income level, Number of sons and daughter and Period of Married.

-Section two was designed and implemented to measure the degree of knowledge of family planning.

-Section three was designed and implemented to measure the practices and utilization rate of family planning

The scoring system for knowledge questionnaire was as the following; satisfactory level if the score $\geq 75\%$, average if ≥ 50 to $< 75\%$ and unsatisfactory if the score less than 50%

Reliability and Validity

Testing of the questionnaire for reliability and validity yielded positive results. Content validity of an original questionnaire was evaluated by nurse educator specialists and pilot sample of 32 women's. Based on their feedback, three items were dropped, one item was added, four items were changed and several items were rephrased for clarity. This results in a new version of the instrument which was administered to intervention and control groups.

The process of conduction program

The process of conduction program executed through the following sequential phases:

Assessment Phase (Pre-intervention Phase):

Upon obtaining permission to proceed with the study, the researchers visited the study settings and introduced the study's purpose to the participating women. The initial interaction involved the researchers introducing themselves, explaining the study's aim and nature concisely, and assuring the women that any obtained information would remain strictly confidential and exclusively utilized for research purposes.

Women were interviewed by the researcher and assistant to collect data as a pre-test on 2/12/2022.

Implementation phase

A community-based educational intervention program about family planning was started at 6/2/2023 by the researcher. This session is a 20 hours education program. The women's in intervention group divided into six groups, each group about 35 women. Provide 12 PowerPoint lectures for each group in four days from 9am to 2pm, and dissection with participant at the end of any lecture.

The program includes:

- Definition and meaning of family planning, methods of family planning.
- All methods, how to use, benefits, effectiveness rate, side effects, complication, contraindication.
- Follow up schedule & methods to ensure cases compliance.
- How to select proper methods
- Important of the follow-up.

At the end of the session, a colour educational materials printed in the Arabic language were distributed

Evaluation phase

The evaluation phase was conducted three month after the intervention (June 2023). Utilizing the same tools, the researchers assessed the impact of program by comparing variances between pre-intervention, post-intervention. This evaluation enabled the researchers to gauge the improvement in the utilization rate among participants.

Ethical consideration

The research is respecting the rights of participants, data treated with confidentiality and no harms for the subjects by interventions since counselling for mothers took place.

Prior to the study the aim of the study was fully explained and clarified by the researcher and assistants

Written official letters were issued from the director of administrative locality of Khartoum North to obtain approval to carry out the study, explaining the aim of the study.

Statistical Analysis:

The data collected for this study were analysed using descriptive statistics such as numbers and percentages. The pre- and post-test data were compared using the independent sample t-test in the Statistical Package for the Social Sciences (SPSS version 23) to determine if there was a significant difference at a P value of <0.05 .

Results

Table 1 shows the demographic characteristics of the study participants the majority of the study participants (81.75%) were between the ages of 20-35 years old in the intervention group, the majority of participants had either an illiterate (40.4%) or secondary school (33.8%) educational level. Regarding income level, the majority of participants in both the intervention group (70.2%) and control group (54.82%) had a medium income.

It is clear from table (2) the correct answers of the participants significantly increased from pre intervention measurement to post intervention measurement, for example regarding the hormonal methods, the correct answer was increased from (23.7%) of the participants at post control measurement (49.6%) of the participants at pre intervention measurement increased to (90.4%) at post intervention measurement. P value was (0.01) indicates significant differences.

Results in Table (3) indicate significant increase in the level of practices of the studied population regarding family planning in the intervention group after attendance of the educational program. For example, the use of the participants family planning methods was 114(50%) of them at pretest intervention, 130(57.0%) of them at post control test and by 190(83.3%) at post measurement. The P value = $0.001 < 0.05$ indicates significant differences between pre and posttest measurements regarding the use of family planning methods. This is further indicated by the results in table (3) with reference to types used, reasons behind use and no use. The overall high practice and very good practices grade were 80% and 60% respectively at post intervention measurement compared to 47% and 22% respectively at pre intervention measurement and 42% and 20% in post control respectively.

Results in figure (1) indicate significant increase in the level of utilization rate of the studied population regarding family planning after attendance of the educational program. The use of the participants family planning methods was (47%) of them at pre intervention measurement and by (80%) at post intervention measurement. The chi square value was 57.0 indicates significant differences between pre and post intervention measurements regarding the use of family planning methods ($P = 0.001 < 0.05$). Results in figure (2) showed the utilization of natural methods, contraceptive pills, and injectable methods has significantly increased from (5.2%, 26.2% and 5.3%) to

(15.4%, 34.2% and 15.8%) respectively. while the increase utilization rate of intrauterine devices and tubal ligation has no statistically significance. The of Utilization of oral pills methods its high I pre and posttest in intervention group.

Table 4 effectively highlights the positive impact of the intervention on participants' knowledge about family planning methods, with a substantial increase in those achieving a satisfactory level. The statistically significant P1 and P2 values reinforce the effectiveness of the intervention, demonstrating improvement compared to both the pre-intervention state and the control group.

Table1. Distribution of the participants' demographic characteristics (n = 456)

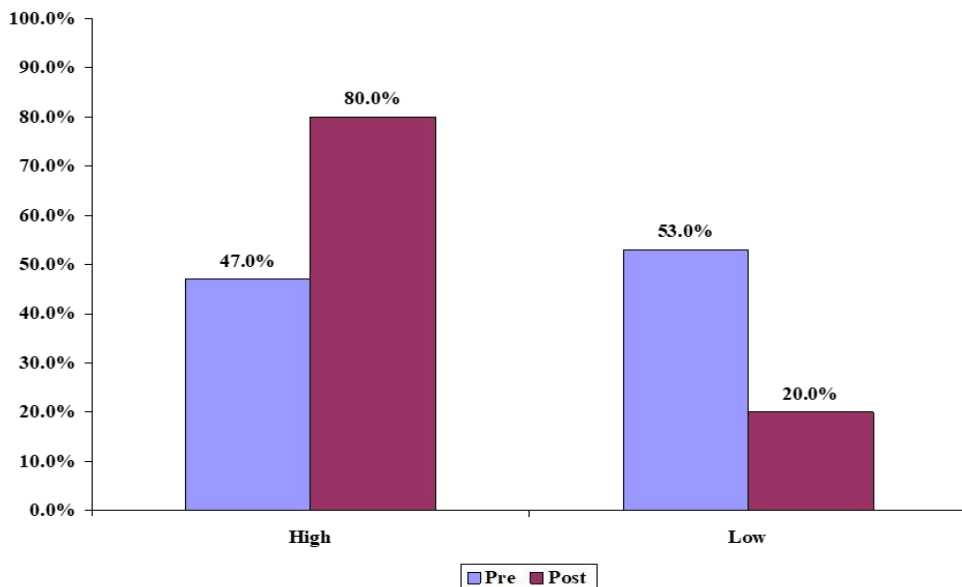
Variable	Intervention group N (%)	Control groups N (%)
Age in years:		
20-35	186 (81.59)	181 (79.36)
36-50	42 (18.41)	47 (20.64)
Educational level:		
Illiterate	92 (40.4)	99 (43.42)
Primary	41 (18.0)	31 (13.59)
Secondary	77 (33.8)	65 (28.50)
University and above	18 (7.9)	33 (14.47)
Level of income:		
Low	29 (12.7)	40 (17.54)
Medium	160 (70.2)	125 (54.82)
High	39 (17.1)	63 (27.63)
Number of children		
< 5	70 (30.7)	55 (24.12)
5 – 10	138(60.5)	140 (61.40)
> 10	20(8.8)	33 14.47)

Table (2): Different in participant's knowledge in pretest intervention, posttest intervention and post control about methods of family planning

Items	Pre intervention N=228 n(%)	Post intervention N=228 n(%)	Control post N=228 n(%)	Chi square	P value
Natural methods	94(54.6)	186(81.9)	80(35.1)	14.6	0.01
Hormonal methods	54(23.7)	196(90.4)	113(49.6)		
surgical Methods	44(19.3)	168(73.7)	59(25.9)		
Barrier methods	56(24.6)	194(85.1)	62(27.2)		
Intrauterine device methods	50(21.9)	148(64.9)	67(29.4)		

Table (3): Different in participant's Utilization rate family planning in pretest intervention, posttest intervention and post control periods

Items		Pre intervention N=228 n(%)	Post intervention N=228 n(%)	Control post N=228 n(%)	P value
Use	No	114(50.0)	38(16.7)	98(43.0)	0.001
	Yes	114(50.0)	190(83.3)	130(57.0)	
Type used	Safe period	12(10.5)	35(18.5)	28(12.5)	0.013
	Oral pills	61(53.5)	78(41.1)	63(48.5)	
	Injectable method	12(10.5)	36(18.9)	23(17.7)	
	Implant	8(7.0)	13(6.8)	5(3.8)	
	IUDs	10(8.8)	12(6.3)	4(3.1)	
	Barrier male - female condom	7(6.2)	12(6.3)	3(2.3)	
	Tubal ligation	4(3.5)	4(2.1)	4(3.1)	
Reasons behind use	Husband approval	32(28.1)	22(11.6)	22(24.6)	0.022
	Safety and no complicated	30(26.3)	56(29.5)	56(47.7)	
	Cheap and available	10(8.8)	12(6.3)	12(6.9)	
	Instruction from health caregiver and physician	22(19.3)	60(31.6)	20(15.4)	
	I know more information about this method	20(17.5)	40(21.1)	40(30.8)	
Reasons of no use	I want more baby	8(7.0)	26(68.4)	14(14.3)	0.033
	Husband objection	26(22.8)	4(10.5)	24(24.5)	
	Religious beliefs	26(22.8)	0(0.0)	16(16.3)	
	Non availability or Financial problem	8(7.0)	2(5.3)	9(9.2)	
	Medical disease	8(7.0)	2(5.3)	20(15.4)	
	No information about method or no benefits to use	8(7.0)	4(10.5)	8(8.2)	
	Fear from side effects	30(26.3)	0(0.0)	7(7.1)	

Figure (1): Comparison of overall total practice contraceptive between pre and post attendance of educational program**Figure (2):** Distribution of the Utilization according to differences between pre and post-test program regarding family planning in intervention group

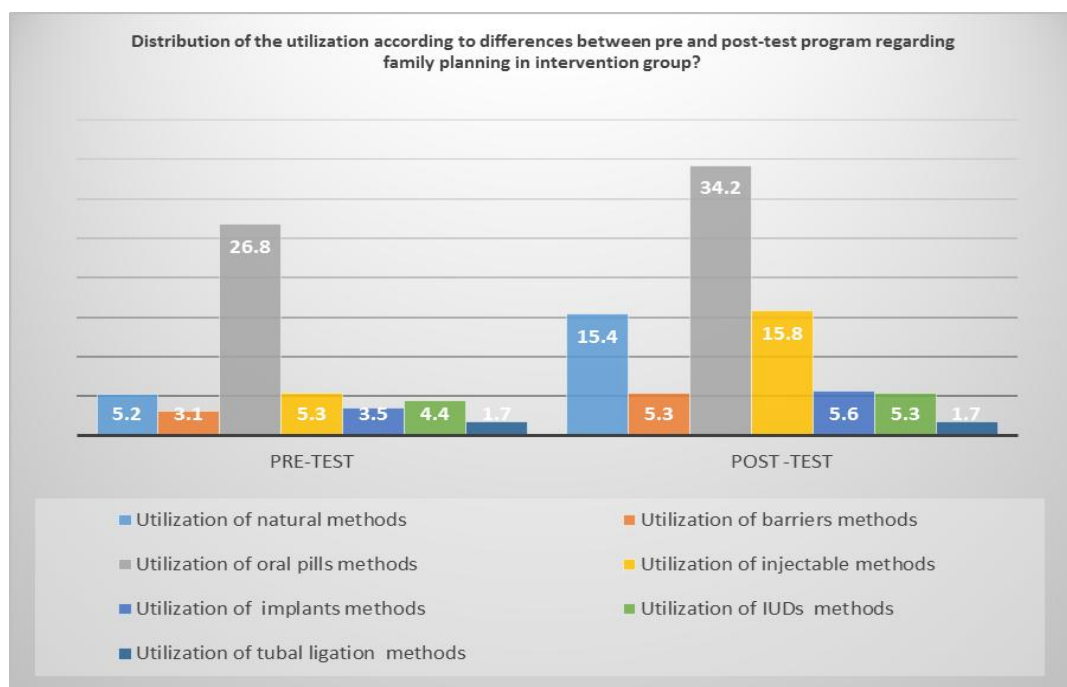


Table (4): Different in participant's levels of knowledge about family planning methods in pretest intervention, posttest intervention in compare with the control group

Levels of knowledge	Pre intervention N=228 n(%)	Post intervention N=228 n(%)	Control post N=228 n(%)	P ¹ value	P ² value
Satisfactory	87(38.2)	134(58.7)	91(39.9)	0.0001	0.0003
Average	60(26.3)	52(22.8)	62(27.2)		
Unsatisfactory	81(35.5)	42(18.4)	75(32.8)		

P¹ between pre and post

P² between post and control group

Discussion

The present study investigated the impact of a family planning education program on contraceptive utilization rate in Sudan. There was significant increase in the level of practices of the studied population regarding family planning after attendance of the educational program. For example, the use of the participants family planning methods was (50%) of them at pre intervention measurement and by (83.3%) at post intervention measurement this indicates significant differences between pre and posttest measurements regarding the use of family planning methods ($P = 0.001$). This is further indicated by the results in with reference to types used, reasons behind use and no use, sources of methods, side effects and the action

to be done when missing taking pills. The overall high practice and very good practices grade were 80% and 60% respectively at post intervention measurement compared to 47% and 22% at pre intervention measurement.

In the present study the utilization rate of family planning methods has been increased after intervention. The utilization of natural methods, contraceptive pills, and injectable methods has significantly increased while the increase utilization rate of intrauterine devices and tubal ligation has no statistically significance. Similar findings were reported from a community-based projects in Sudan which showed that the training of midwives to deliver a health messages related to family planning and other issues significantly improved the contraceptive use (El toum et al.,

1987). Different intervention programs were used to improve contraceptive use; similar to our findings in one study in Bangladesh using credit intervention program showed credit programs are contributing factors improve contraceptive use (**Goni and Rahman, 2012**)

Another community based intervention, which was conducted in India showed that it increased contraceptive use (**Daniel et al., 2008**). A school-based reproductive health education in Zimbabwe which showed that contraceptive use was increased after intervention (**Mbizvo et al., 1997**)

The study showed that the contraceptives pills are the mainly used method as family planning method before and after intervention followed by natural methods and contraceptive injection then intrauterine devices. Our findings were similar to reports from United State, which showed that pills are the dominant method, followed by sterilization which is different from our findings (**Mosher et al., 2004**)

In the present study the reason for not using contraceptives were as follows: 26.3% of women were worried about side effects, 22.8% husband objection and 22.8% due to religious beliefs. Previous studies in Khartoum States and Darfur in Western Sudan pointed out that many users experienced side effects from different methods, and that side effects are the common causes for either ceasing contraception altogether, or changing the type of contraceptive to a more traditional method which is less effective (**Abdalla and Ahmmed, 2017 and Ali et al., 2013 and Ali et al., 2011 and Haggaz et al., 2009**). Our finding had been supported by other studies conducted in Ethiopia and Bangladesh (**Taliahun et al., 2013 and Goni and Rahman, 2012**)

The results of the current study revealed that the educational intervention was significantly effective in improving the level of awareness among studied women about the family planning methods. The current study was supported by **Yadassa, Debelew& Birhanu (2023)**. In the same line **Al-Dubhani et al., (2014)** concluded that the levels of knowledge about the family planning methods were significantly improved after the intervention program.

Limitation of the study

It is essential to note that the study was limited to only one area, Aldroshab and Alkdre, in Khartoum State, Sudan which can't be generalized for the whole country.

Conclusions

In conclusion, the study found a significant improvement in utilization of contraceptive methods, there were statistical significant differences between pre interventions, post intervention and post control participant's practices regarding family planning.

Recommendation:

After obtaining the study findings based on the conclusion, the study recommends that:

- To Increase awareness of mother towards family planning uses different means of mass of social media like TV, Radio, Videos, Whatapp, Facebook and tweeter.
- Simplification and maximum utilization of the family planning health education programs.
- Improved quality of counseling for women and men to alleviate conflict between couples regarding family planning
- Further research to investigate other family planning issue

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