BMC Women's Health

RESEARCH Open Access

Effects of family planning education given to married illiterate women of reproductive age via visual material support on family planning related attitudes and contraceptive preferences: the example of Viranşehir, Türkiye

Esra Güney[1*], Sözdar Karakaş[2] and Yurdagül Doğan[3]

Abstract

Objective This study was conducted to determine the effects of family planning education given to married illiterate women of reproductive age via visual material support on their family planning attitudes and contraceptive preferences.

Method The randomized controlled study was carried out between 31 January and 31 July 2023. The sample of the study consisted of 148 women, including 74 in the experimental group and 74 in the control group. Using a Family Planning Education Booklet prepared for illiterate women, an education program lasting a week in total was held in three sessions. No intervention was made in the control group. Data were collected using a Personal Information Form, a Family Planning Assessment Form, and the Family Planning Attitude Scale.

Results After the intervention, the Family Planning Attitude Scale total and subscale scores of the participants were significantly higher in the experimental group compared to both their pretest scores and the posttest scores of the control group ($p < 0.001$). There was an increase in the rates of participants who preferred modern and effective family planning methods in the experimental group after the education program. All participants in the experimental group stated that they were satisfied with the education given within the scope of the study.

Conclusion The family planning education program provided to women using educational content prepared for illiterate women was effective in increasing the knowledge and positive attitudes of the women regarding family planning.

Keywords Family planning, Education, Attitudes, Contraceptive methods, Midwifery

This study was presented as an oral presentation at 10th International 14th National Midwifery Students Congress, Tokat Gaziosmanpaşa University, May 16-18, 2024, Tokat, Türkiye,

*Correspondence:
Esra Güney
esra.guney@inonu.edu.tr
[1]Department of Midwifery, Inonu University, Malatya 44280, Türkiye
[2]Department of Midwifery, Inonu University, Şanlıurfa 63000, Türkiye
[3]Department of Midwifery, Inonu University, Gaziantep 27000, Türkiye

Introduction

Family planning (FP) has a vital place among basic healthcare services. Regarding these services, it is accepted that individuals and couples should have the to have as many children as they want at any point in their lives that they desire, and they should be able to plan the time interval they wish to have between two children and make decisions freely within the bounds of their individual responsibilities [1, 2]. In this sense, the services that are offered for making the education, information, and materials necessary for FP available are defined as FP services [2, 3].

Individuals have different knowledge and needs regarding parenthood, different attitudes toward FP, and different fertility preferences from each other. It may be stated that individuals do not have the desired level of knowledge related to FP, and the reasons for this situation include education levels, age, employment status, family structure, FP-related education status, and obstetric characteristics [4, 5]. It has been demonstrated in the literature that illiterate women, in particular, have much higher rates of having false information or misconceptions about FP methods in comparison to their counterparts with formal education (primary-middle school, high school, or university) [6]. It has been reported that uneducated women who use any FP method at all use modern methods less frequently [3], and as education levels increase, the rates of women using any FP method and those using effective methods also increase [7–9]. This suggests that education levels are highly influential on the fertility-related decisions and attitudes of individuals.

It is seen that changing the attitudes of women toward FP usage in a positive direction is associated with issues such as their desire to have babies in the future, their desired number of pregnancies, childbirth intervals, and effective contraceptive method usage [10–13]. In particular, women who not only live in rural areas but also are illiterate should be considered a specialized group [14]. It is very important to evaluate the fertility-related knowledge and attitudes of these women and raise awareness among them about this issue. Therefore, in this study, it was aimed to provide education to married illiterate women of reproductive age using visual materials to change their FP-related attitudes in a positive direction and transform these attitudes into positive fertility behaviors.

The hypotheses of the study were as follows:

H_{1a}: FP education given with visual materials increases positive attitudes toward FP in illiterate women.

H_{1b}: FP education given with visual materials affects the contraceptive preferences of illiterate women.

Methods

Study design

This randomized controlled study was carried out between 31 January and 31 July 2023 at a Family Health Center in the Southeastern Anatolia Region of Turkey. A power analysis was conducted to determine the minimum required sample size by assuming an 80% power to represent the population and that a FP attitude mean score of 81.30 (standard deviation: 17.34) found in a previous study [15] would increase by 8 points as a result of the intervention to be made in this study (5% error margin, two-tailed significance, 95% confidence interval). It was determined that each group needed to include at least 74 participants. Women who met the inclusion criteria of the study and agreed to participate in the study were randomly assigned to the experimental and control groups by simple randomization [16].

Inclusion criteria:

- Being illiterate,
- Being able to communicate,
- Not having any visual or auditory problems that could prevent communication,
- Being aged 15–49 and married,
- Not having a diagnosis of chronic illness (e.g., cardiovascular diseases, asthma, epilepsy),
- Not receiving any FP-related education within the last 21 days.

Exclusion criteria:

- Being pregnant or having suspicion of pregnancy during the study period,
- Planning to get pregnant soon,
- Currently using an effective family planning method (e.g., birth control pills, IUD, implants, tube ligation),
- Living in Viranşehir temporarily (e.g., seasonal workers and guests) and not staying in the region throughout the study period.

In the experimental group initially consisting of 81 participants, 5 women were excluded as they did not want to continue to take part in the study, and 2 were excluded as they were planning to get pregnant soon. In the control group initially consisting of 76 participants, 2 women were excluded because they did not want to respond to the posttest data collection forms.

Randomization

Women who met the inclusion criteria of the study were identified on the information system of the Family Health Center (FHC) and listed. These women were contacted via their telephone numbers in the information system, they were given brief information about the study, and

they were invited to the FHC for detailed information. A list containing the names of the women who visited the FHC and agreed to participate in the study was created. The allocation of the participants to the experimental and control groups was carried out using the computer-based randomization function on the Random.org website. In this process, first of all, the groups were assigned the numbers 1 and 2 by drawing a lot. As a consequence of the draw, the experimental group was given the number 1, while the control group was given the number 2 (Random.org, 1998). Then, using the random integer generator function on the Random.org website, a randomization column was created, and the participants were allocated to the groups based on this column. This method ensured that each participant had an equal probability of being assigned to either group and minimized the risk of systemic bias. The criteria of the CONSORT statement, which is used for randomization and the creation of flowcharts in experimental studies was taken into account, and the flowchart of this study is presented in Fig. 1 [17]. Because the researchers needed to conduct the educational intervention and manage the data collection process, they knew the group allocations. Although the participants were informed about the general purpose of the study, they were not given information about the groups to which they were allocated. Thus, this study had a single-blind design. While the fact that the researchers were not blind to the procedures ensured that the educational intervention process was managed effectively, the blinding of the participants reduced the risk of bias in the measurements of their parameters, especially attitudes and behaviors.

Data collection

Data were collected from the participants between 31 January and 31 July 2023. The data collection instruments were filled out at 3 stages by the researcher using a data collection form with the face-to-face survey method at the Family Health Center No 6 affiliated with the Viranşehir District Directorate of Health. This FHC was selected because it was in a rural area, and the literacy rates of women in the area were low. In total, 4113 women aged 15–49 were registered at the FHC where this study was carried out, and 5 family physicians, 2 midwives, and 3 nurses were working at the FHC. The FHC offers routine follow-ups, whereas it does not offer any FP education program specifically organized for illiterate women. The educational material used within the scope of the study was developed by EG, SK, and YD with a multidisciplinary approach. The steps in the Education Booklet were followed by SK and YD, who also conducted the educational interventions. The authors were receiving their undergraduate education based on the curriculum of the Department of Midwifery at the Faculty of Health Sciences at İnönü University, and they had taken and successfully completed the Family Planning course in the curriculum. This course aims to equip students with the clinical skills required for counseling in the field of family planning. According to the directives of the curriculum, students who successfully complete this course are academically certified to possess the knowledge and skills necessary to provide effective counseling about family planning.

The participants in the experimental group were given individual FP education by the researcher in the Education/Counseling/Breastfeeding room at the FHC. This room included two comfortable and ergonomic chairs that could be used by women while breastfeeding. To ensure the privacy of the counselee, during the educational intervention, it was made sure that the researcher and the participant were alone in the room. The setting was kept quiet and calm as much as possible. The participants were encouraged to take the most comfortable position in their chairs during the intervention.

Stage 1 (Day 1, 10–15 min) Information about the study was given to women who met the inclusion criteria, and verbal consent was obtained from those who agreed to participate. Next, the education content for Session 1 in the FP Education Booklet prepared by the researchers was provided to the participants using the face-to-face interview method. After making an appointment for Stage 2 (Day 3) to be carried out at the FHC, the first stage of the data collection process was complete.

Stage 2 (Day 3, 10–15 min) The education content for Session 2 in the FP Education Booklet was provided to the participants who arrived at the FHC on their predetermined appointment days using the face-to-face interview method. After making an appointment for Stage 3 (Day 7) to be carried out at the FHC, the second stage of the data collection process was complete.

Stage 3 (Day 7, 1–5 min) The data collection forms were administered again to the participants who arrived at the FHC on their appointment days assigned at Stage 2, and the data collection process was complete.

Education material (FP education Booklet) The booklet was prepared by the researchers based on the Reproductive Health Programs [18] section on the website of the Department of Gynecological and Reproductive Health under the General Directorate of Public Health of the Turkish Ministry of Health and the "Visualized Guidebook for Family Planning Counseling" prepared by the General Directorate of Maternal and Child Health and Family Planning (2010) [19]. The 1st-session content of the booklet included visuals about the topics of "Female

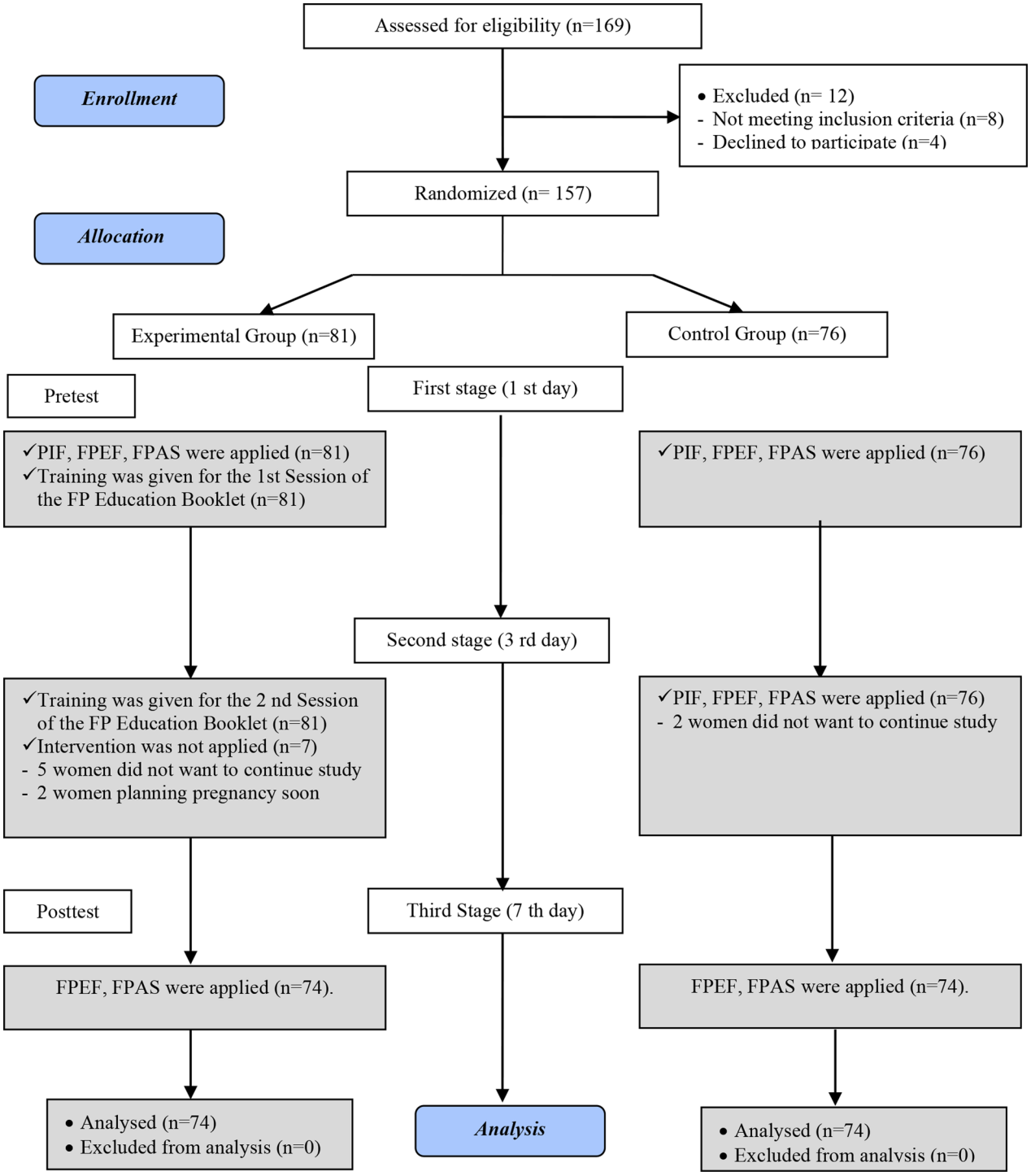


Fig. 1 FP: Family Planning, PIF: Personal Information Form, FPEF: Family Planning Evaluation Form, FPAS: Family Planning Attitude Scale

Reproductive Organs, Male Reproductive Organs, and Development of Pregnancy". The 2nd-session content of the booklet included visuals about the topics of "Temporary-Permanent Methods for Women, Temporary-Permanent Methods for Men, and Emergency Contraception". All visuals used in the booklet were prepared in the digital environment.

No intervention was made in the control group. The same data collection instruments were administered to the participants in the control group simultaneously with the experimental group in the pretest (day 1) and posttest (day 7) phases. After the completion of the data collection stage, the participants in the control group were given information about FP education. Fifty-one women

who wished to receive information about FP were given education by the researcher, and the process was completed. In this process, it was aimed to ensure the external validity of the experimental design and offer all participants an equal opportunity to participate in the intervention. Thus, the data collection process was not influenced by the education program. These procedures constituted an important step in terms of minimizing the risk of bias and protecting scientific integrity.

Data collection instruments

The data were collected using a Personal Information Form and a Family Planning Assessment Form, which were developed by the researchers by reviewing the relevant literature, and the Family Planning Attitude Scale.

Personal information form (PIF)

FPAF was prepared by the researchers by reviewing the relevant literature to identify the attitudes of the participants toward family planning and their contraceptive preferences. The content of the form was created by examining validated scales and other assessment tools used in previous studies, and the items on the form were made suitable for the context of the study. The form included questions about parameters such as the contraceptive methods currently used by the participants, their reasons for choosing these methods, the influence of their spouses on their decision-making processes, previously used contraceptive methods, and their reasons for quitting these methods. To achieve content validity, the items were created by utilizing information reported in previous studies in the relevant literature, and the form was based on the theoretical framework in the relevant field [4, 5, 9, 11]. However, no independent validity and reliability analysis was performed. The usage of such structured forms in applied studies in the fields of social sciences and health sciences is a prevalent method, and assessments made using measurement instruments developed in line with data obtained from the relevant literature are assumed to be valid [20–22].

Family planning attitude scale (FPAS)

The scale, which was developed by Örsal and Kubilay to evaluate attitudes toward FP, consists of 34 items. Its total score range is 34–170, and higher scores indicate more positive attitudes toward FP. The subscales of the scale are Society's Attitude Towards Family Planning (SATFP score range: 15–75), Attitude Towards Family Planning Methods (ATFPM score range: 11–55), and Attitude Towards Childbirth (ATC score range: 8–40). The Cronbach's Alpha coefficient of the overall scale was reported as 0.90 [23]. In this study, Cronbach's Alpha coefficients were found as 0.848 for the overall scale and 0.766, 0.769, and 0.748 for the aforementioned subscales, respectively.

Family planning assessment form (FPAF)

The form, which was created by the researchers by reviewing the literature, included questions about the characteristics of the participants such as the contraceptive methods they were currently using, their reasons for using (preferring) the current method, the person (self or spouse) selecting the method, previously used FP methods and reasons for quitting, the person (self or spouse) choosing to quit the method, and whether they were satisfied with the methods they used.

Statistical analysis

The collected data were analyzed using the SPSS 25.0 for Windows (SPSS, Chicago, IL, USA) program. Descriptive statistics are presented as frequency, percentage, mean, and standard deviation values. Independent-samples t-tests were conducted to make comparisons between the experimental and control groups. Paired-samples t-tests were conducted to make intragroup comparisons. The level of statistical significance was selected as $p < 0.05$.

Ethical considerations

For conducting the study, ethical approval was obtained from the Inonu University Noninvasive Clinical Research and Publication Ethics Committee (Decision No: 2022/3724), permission was received from the institution where the data would be collected, and the protocol of the study was registered at www.clinicaltrials.gov (NCT06755749, Registration Date: 31.01.2023). In addition, this study was conducted in accordance with the principles of the Declaration of Helsinki. All women in the study were informed about the study on the first page of the data collection tools, and their informed consent was obtained. The participant recruitment process in the study was designed by taking the characteristics of individuals who are illiterate into account. The information and consent processes were supported with verbal and visual (e.g., figures, symbols, pictures) communication materials. The participants were informed about the objective, methodology, expected benefits, and potential risks of the study in detail by the participants during face-to-face meetings. Simple and clear language that all participants could understand was used in this process. The verbal informed consent of the participants was obtained, and this situation was documented in the presence of a witness. This allowed the inclusion of illiterate participants in the study in line with ethical principles. The researchers made additional explanations when the participants had any questions or concerns, and the inclusion of the participants was on a voluntary basis.

Table 1 Sociodemographic and obstetric characteristics of the participants ($n=148$)

Characteristics	Experimental Group ($n=74$)		Control Group ($n=74$)		Test[a] and p values
Age (years) (Mean ± SD)	31.31 ± 4.37		30.36 ± 4.87		t = 1.242, $p=0.216$
Marriage (years) (Mean ± SD)	10.09 ± 4.39		9.37 ± 5.42		t = 0.883, $p=0.379$
	n	**%**	**n**	**%**	
Age (years)					$p=0.176$[c]
19–29 years	24	42.1	33	57.9	
30–39 years	50	54.9	41	45.1	
Marriage duration (years)					$p=0.508$[c]
≤ 10 years	39	47.3	44	59.5	
≥ 11 years	35	52.7	30	40.5	
Income status					$p=0.117$[c]
Low	16	21.6	8	10.8	
Moderate	58	78.4	66	89.2	
Family type					$p=0.857$[c]
Nuclear family	51	68.9	53	71.6	
Extended family	23	31.1	21	28.4	
Number of pregnancies					$\chi^2=1.085$, $p=0.581$
1–2 pregnancies	28	37.8	34	45.9	
3–4 pregnancies	25	33.8	23	31.1	
≥ 5 pregnancies	21	28.4	17	23.0	
Number of miscarriages					$p=0.754$[c]
1–2 miscarriages	12	63.2	18	69.2	
≥ 3 miscarriages	7	36.8	8	30.8	
Number of curettages					$p=0.643$[c]
1–2 curettages	4	80.0	2	66.7	
≥ 3 curettages	1	20.0	1	33.3	
Number of living children					$\chi^2=2.830$, $p=0.243$
1–2 children	50	67.6	59	79.7	
3–4 children	14	18.9	9	12.2	
≥ 5 children	10	13.5	6	8.1	

[a]Independent Samples *t*-test, [b]Pearson Chi-Square Test, [c]Fisher's Exact Test

Table 2 Intragroup and intergroup comparisons of the pretest and posttest FPAS total and subscale scores of the experimental and control groups ($n=148$)

	Experimental Group ($n=74$)	Control Group ($n=74$)	Test[a] and p values
	Mean ± SD	**Mean ± SD**	
SATFP sub-dimension			
Pretest	47.63 ± 6.49	48.97 ± 6.85	t=-1.218 $p=0.225$
Posttest	54.47 ± 8.93	49.32 ± 7.13	t = 3.875 $p=0.000$
Test[b] and p values	t=-5.249 $p=0.000$	t=-1.552 $p=0.125$	
ATFPM sub-dimension			
Pretest	34.37 ± 4.19	35.14 ± 3.88	t=-1.159 $p=0.248$
Posttest	42.70 ± 2.84	35.37 ± 4.47	t = 11.881 $p=0.000$
Test[b] and p values	t=-16.144 $p=0.000$	t=-0.942 $p=0.349$	
ATC sub-dimension			
Pretest	28.01 ± 3.90	27.47 ± 3.36	t = 0.902 $p=0.369$
Posttest	30.35 ± 2.36	27.35 ± 3.93	t = 5.623 $p=0.000$
Test[b] and p values	t=-4.736 $p=0.000$	t = 0.471 $p=0.639$	
FPAS Total			
Pretest	109.50 ± 12.18	111.27 ± 11.41	t=-0.912 $p=0.363$
Posttest	124.08 ± 9.70	112.05 ± 12.50	t = 6.539 $p=0.000$
Test[b] and p values	t=-9.015 $p=0.000$	t=-1.426 $p=0.158$	

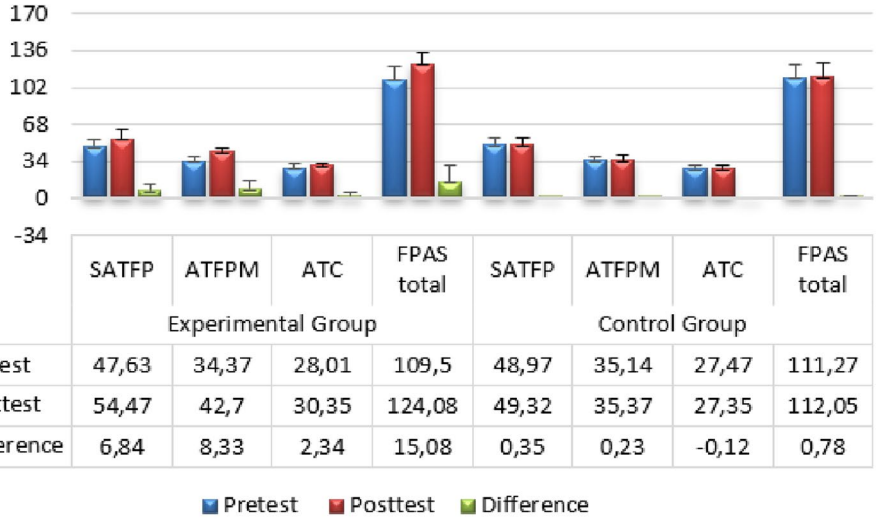
[a]Independent Samples *t*-test, [b]Dependent Samples *t*-test, FPAS: Family Planning Attitude Scale, SATFP: Society's Attitude Towards Family Planning, ATFPM: Attitude Towards Family Planning Methods, ATC: Attitude Towards Childbirth

Results

Some sociodemographic and obstetric characteristics of the participants are presented in Table 1. The differences between the experimental and control groups in terms of the age, year of marriage, income level, family type, number of pregnancies, number of miscarriages and abortions, and number of living children variables were not statistically significant ($p>0.05$) (Table 1).

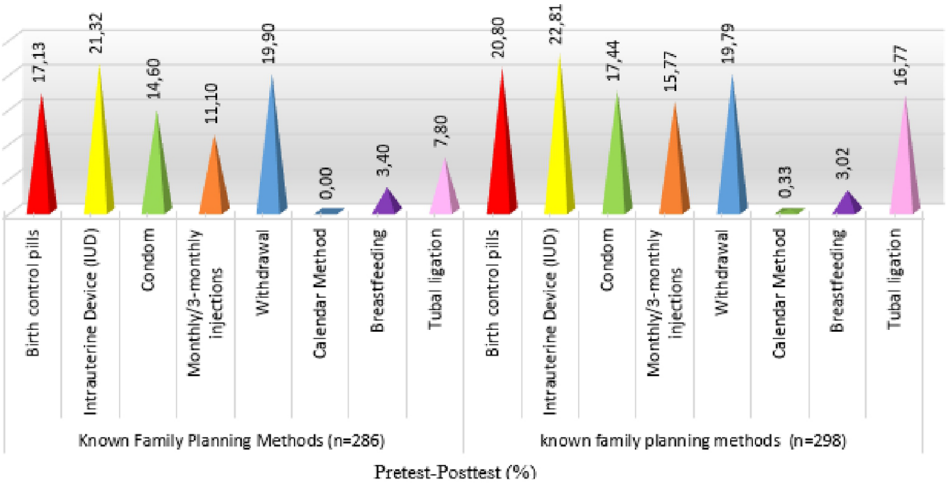
The mean FPAS total and subscale scores of the participants in the experimental and control groups in the pretest and posttest are presented in Table 2. According to the results of the paired-samples t-tests, the difference between the pretest and posttest scores of the participants in the experimental group on FPAS and its subscales was statistically significant ($p<0.001$), while there was no significant difference between the pretest and posttest scores of the participants in the control group ($p>0.05$). According to the result of the independent-samples t-tests, the differences between the pretest-posttest FPAS total and subscale scores of the participants in the experimental and control groups were significant ($p<0.001$) (Table 2; Fig. 2).

The distributions of the contraceptive preferences of the participants in the experimental group based on their pretest and posttest data are given in Fig. 3. Accordingly, after the education given to them, the participants had higher rates of knowing each given FP method. In addition to this, it was determined that the contraceptive preferences of the participants changed after the education program, and while the preference rates of more protective methods like tube ligation and IUDs increased, the preference rate of the less protective pulling out method decreased (Fig. 3).



	SATFP	ATFPM	ATC	FPAS total	SATFP	ATFPM	ATC	FPAS total
	Experimental Group				Control Group			
Pretest	47,63	34,37	28,01	109,5	48,97	35,14	27,47	111,27
Posttest	54,47	42,7	30,35	124,08	49,32	35,37	27,35	112,05
Difference	6,84	8,33	2,34	15,08	0,35	0,23	-0,12	0,78

Fig. 2 Pretest and posttest FPAS total and subscale scores of the participants



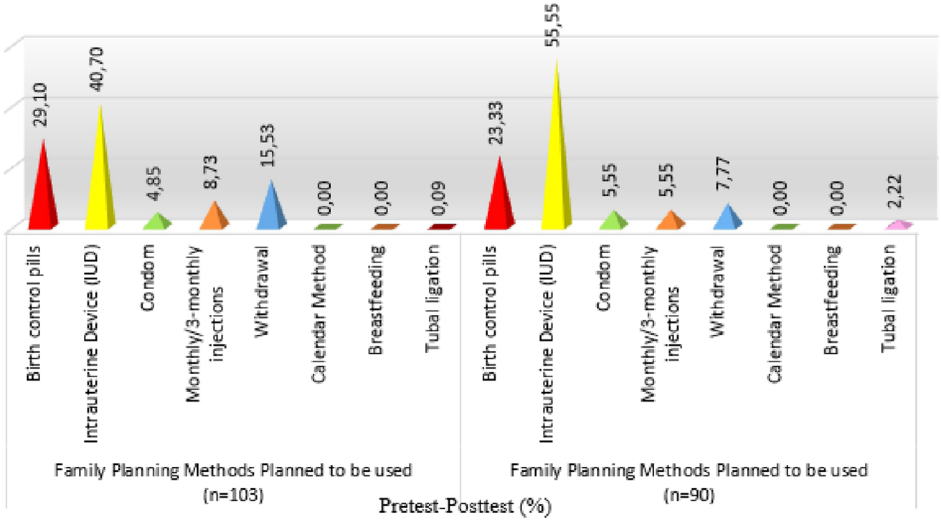


Fig. 3 The distributions of the contraceptive preferences of the participants in the experimental group based on their pretest and posttest data

Discussion

In this study, which was carried out to determine the effects of FP education given to married illiterate women of reproductive age with the support of visual materials on their FP-related attitudes and contraceptive preferences, it was observed that after the education program, the participants in the experimental group had better attitudes toward family planning, perceived better attitudes of society toward family planning, and displayed better attitudes toward pregnancy (Table 2; Fig. 2). According to this result, the FP education given using educational materials prepared based on the education levels of the participants had significant effects on the FP-related attitudes and contraceptive preferences of the participants. In the literature, some studies have revealed results that supported the results of this study. In an experimental study in which the effects of FP education designed for university students on attitudes toward FP were investigated, the education given to university students was found to affect FP-related attitudes positively [24]. In a study performed to determine the effects of FP health education on the knowledge and attitudes of women, FP education was provided to women in four sessions, and at the end of the process, it was found that the education program was effective in increasing the knowledge levels of the women about FP and improving their attitudes toward FP [25].

The effects of using an individual-centered FP education poster and a general FP education poster were compared in a previous study, and it was seen that the individuals who were given education with the individual-centered FP education poster had higher levels of knowledge and higher levels of intention to use effective contraceptive methods [26]. In a study conducted to examine the effects of an education program about emergency contraceptive methods and condom usage on the FP-related knowledge, attitudes, and behaviors of university students, the positive attitudes and behaviors of women who took part in the education program regarding FP increased [27]. In another study, where the effects of sexual and reproductive health education on contraception were investigated, women who received education were found to be more likely to use contraceptive methods [28]. The results of this study highlighted that the provision of education and people's education levels are crucially important in efforts to increase the FP-related knowledge, positive attitudes, and positive behaviors of individuals. Such that, in some studies supporting this result, it was also seen that education levels played a key role in developing FP-related knowledge, attitudes, and behaviors. In an exploratory study on the FP-related attitudes of women, it was determined that attitudes toward FP became more positive as the education levels of women increased, and the lowest scores of positive attitudes were seen in the illiterate group [29]. In studies performed to identify the attitudes of 15-49-year-old married women toward FP, positive attitudes toward FP increased as education levels increased, and the attitudes of those who were illiterate were less positive [11, 30]. FPAS was also used in a study on the attitudes of postpartum women toward FP and associated factors, and it was found that women who had lower levels of education had lower FPAS total and subscale scores [31].

According to another result of this study, the participants who received FP education had higher rates of preferring modern and effective FP methods while selecting which method to use (Fig. 3). Accordingly, it may be considered that individuals who have increased levels of education about FP plan to use effective protection methods to minimize the risk of unplanned pregnancies. The literature review that was conducted for this study also revealed other studies supportive of the results of this study. In an experimental study conducted to determine the effects of an individualized community-based counseling and guidance program on the usage of modern contraceptive methods, a home-based counseling and guidance program was developed for women in low-income urban settlements, and FP education was given to these women. The authors reported that the rates of modern contraceptive usage in those who received education increased, and the effectiveness of this education program persisted for two years [32]. In another study where the individual and societal factors associated with the usage of modern contraceptive methods by married women were examined, women with medium/high levels of education were found to be more likely to use modern contraceptive methods, and higher education levels in society were effective in this preference [33]. In a retrospective study in Pakistan investigating the effects of a home-based family planning counseling and guidance program on the usage of modern contraceptive methods, it was determined that the prevalence of modern contraceptive usage increased among the women who took part in the program [34]. The effects of receiving FP counseling on the usage of modern contraceptive methods in the postpartum period were investigated, and it was found that having received FP counseling from any healthcare worker or an official at any healthcare institution within the last 12 months improved the preference of using modern contraceptive methods in postpartum women [35].

Strengths and limitations

It will be beneficial to consider the methodology, analysis methods, sample characteristics, and scientific contributions of this study while identifying its strengths and limitations. This study makes a significant contribution to the literature by focusing on married illiterate

women of reproductive age, who constitute an often-neglected group in this context. The use of visual materials throughout the educational process made the access of the participants to information easier and increased the effectiveness of the educational intervention. The provision of education sessions by midwives who were trained in the field of counseling for family planning supported the reliability and applicability of the study. The procedures of the study contributed to raising awareness among women, especially those who were living in rural areas and had low education levels, regarding family planning. An approach complying with applicable ethical principles was achieved by receiving the verbal consent of the participants and supporting the information process with visual aids due to the fact that the participants were illiterate.

A one-week education process may not be sufficient to create permanent behavioral change. Longer-term follow-up studies are needed to investigate the long-term effects of similar interventions. The fact that the participants were not given reminder or reinforcement sessions after the completion of the educational intervention raised the probability of them forgetting the information they had learned in the process. Because the sample of the study only included women living in the district of Viranşehir, the generalizability of the findings of this study is limited. The collection of data about the attitudes and preferences of the participants based on their self-reports brought about the risk of social desirability bias. No follow-ups were carried out to investigate the long-term effects of the education program. This led to the results of the study about the permanence of the effects of the intervention to remain limited. The actual compliance of the participants with their contraceptive methods after the intervention could not be evaluated. Although the effects of the educational intervention on attitude-related variables were examined, whether these attitudinal changes were transformed into the sustainable usage of contraceptive methods in practice was not checked. This situation provided limited information about the long-term behavioral effects of the intervention. No assessment was made regarding the extent to which the participants adopted the use of contraceptive methods or whether they used these methods in a sustainable manner. This limitation prevented us from understanding the exact potential of the intervention to create permanent behavioral change.

Conclusion and recommendations

It may be concluded that with FP counseling to be provided to illiterate women using visual educational materials, positive attitudes toward FP will develop in these women, and this will increase the usage of FP methods in general and modern methods in particular, ultimately raising the level of fertility planning. As fertility is planned to a greater extent, unwanted, advanced-age, and adolescent pregnancies, abortions, and maternal and infant diseases and mortalities associated with pregnancy and childbirth will be prevented. The right of individuals and couples to choose the number of children they want to have and the time interval between two children will be strengthened, the integrity of families will be preserved, and the physical and mental health of mothers will be protected. This will also allow children who are born as a result of responsible and planned pregnancies to develop better in the physical, mental, and social sense. Moreover, as the effectiveness of the digital education content in this study was proven, future implementations may choose to use additional virtual reality applications. This way, access to education programs can be made easier, and all individuals of reproductive age (e.g., women, men, adolescents, young people, older people) can have cost- and time-effective ways of accessing these opportunities. Hence, to transform attitudes toward FP into positive fertility behaviors in the long term, education programs and counseling services specific to certain sociodemographic characteristics should be planned and implemented. It is recommended that future studies employ longer intervention durations and add periodic reinforcement sessions. The generalizability of the results can be increased by conducting studies with broader samples from different geographical regions. The effects of educational interventions on permanent behavioral change can be understood better by performing long-term follow-up studies.

Abbreviations

FP	Family Planning
FPAS	Family Planning Attitude Scale
SATFP	Society's Attitude Towards Family Planning
ATFPM	Attitude Towards Family Planning Methods
ATC	Attitude Towards Childbirth
FPAF	Family Planning Assessment Form
CNN	Convolutional Neural Network
FHC	Family Health Center

Acknowledgements

The researchers thank the women for their cooperation. Also the researchers would like to thank Andrew Harmon (Proofreader, Glocal Translation) for translation support from Turkish to English.

Author contributions

S.K. and Y.D.made significant contributions to the conceptualization and design of the work, acquisition of data. E.G. contributed to the analysis and interpretation of data, drafting of the work, and significantly revised the work. All the authors approved its final version.

Funding

This study received financial support from The Scientific and Technological Research Council of Türkiye (TÜBİTAK), 2209/A University Students Research Projects Support Program.

Data availability

The author may provide access to the data used in this study upon reasonable request and if deemed appropriate.

Declarations

Ethics approval and consent to participate

For conducting the study, ethical approval was obtained from the Inonu University Noninvasive Clinical Research and Publication Ethics Committee (Decision No: 2022/3724), permission was received from the institution where the data would be collected, and the protocol of the study was registered at www.clinicaltrials.gov (NCT06755749, Registration Date: 31.01.2023). In addition, this study was conducted in accordance with the principles of the Declaration of Helsinki. All women in the study were informed about the study on the first page of the data collection tools, and their informed consent was obtained. The participant recruitment process in the study was designed by taking the characteristics of individuals who are illiterate into account. The information and consent processes were supported with verbal and visual (e.g., figures, symbols, pictures) communication materials. The participants were informed about the objective, methodology, expected benefits, and potential risks of the study in detail by the participants during face-to-face meetings. Simple and clear language that all participants could understand was used in this process. The verbal informed consent of the participants was obtained, and this situation was documented in the presence of a witness. This allowed the inclusion of illiterate participants in the study in line with ethical principles. The researchers made additional explanations when the participants had any questions or concerns, and the inclusion of the participants was on a voluntary basis.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

Received: 1 January 2025 / Accepted: 25 April 2025
Published online: 09 May 2025

References

1. UNFPA, The State of World Population. (2012), Information and External Relations Division of UNFPA, the United Nations Population Fund. https://www.unfpa.org/sites/default/files/pub-pdf/EN_SWOP2012_Report.pdf
2. WHO, Family planning/contraception methods. (2020). https://www.who.int/news-room/fact-sheets/detail/family-planning-contraception
3. Hacettepe University Institute of Population Studies. 2018 Turkey demographic and health survey. Türkiye: Hacettepe University Institute of Population Studies, Presidency of Strategy and Budget of the Republic of Türkiye and TÜBİTAK, Ankara; 2019.
4. Sørensen NO, Marcussen S, Backhausen MG, Juhl M, Schmidt L, Tydén T, Hegaard HK. Fertility awareness and attitudes towards parenthood among Danish university college students. Reprod Health. 2016;13(1):1–10.
5. Kudesia R, Chernyak E, McAvey B. Low fertility awareness in united States reproductive-aged women and medical trainees: creation and validation of the fertility & infertility treatment knowledge score (FIT-KS). Fertil Steril. 2017;108(4):711–7.
6. Dağdeviren H, Cengiz H, Babaoğlu B, Cihan K, Doğan K, Yıldız Ş. Investigation of knowledge level about intrauterine device. Cukurova Med J. 2013;38(3):440–5.
7. Idris Sagiron E, Hussein Ahmed Y, Mohamed Ahmed Osman A, Khalil Elfaki N, Elradhi Abdulrahman N, Ateeg Abdelrahman M, Ramadan Elrefaey S. Effectiveness of a family planning education program on contraceptive utilization among women in Sudan-a quasi-experimental study. Egypt J Health Care. 2024;15(1):1341–50.
8. Dirican AÖ, Inal ZÖ, Inal HA. The level of using family planning methods in refugees in Türkiye and the factors affecting their choices: a retrospective clinical study. J Clin Obstet Gynecol. 2022;32(3):85–92.
9. Ozturk R, Guner O, Gumusso S, Kavlak O. Investigating generation differences in the use of family planning method: a cross-sectional study. JBACHS. 2020;4(3):335–41.
10. WHO Programming strategies for Postpartum Family Planning. (2013). https://iris.who.int/bitstream/handle/10665/93680/9789241506496_eng.pdf
11. Nazik F, Mumcu Ş, Sönmez M, Yılmaz AN, Yüksekol ÖD. 15–49 determination of attitudes of 15–49 age married women towards family planning. Ordu Univ J Nurs Stud. 2021;4(3):326–36.
12. Prata N, Fraser A, Huchko MJ, Gipson JD, Withers M, Lewis S, Ciaraldi EJ, Upadhyay UD. Women's empowerment and family planning: a review of the literature. J Biosoc Sci. 2017;49(6):713–43.
13. Alano A, Hanson L. Women's perception about contraceptive use benefits towards empowerment: A phenomenological study in Southern Ethiopia. PLoS ONE. 2018;13(9):e0203432.
14. Gökçe N, Yıldız A. Iliterate women in Turkey and their reasons for non-participation in literacy courses: what would I do with reading, will my life change? Kastamonu Educ J. 2018;26(6):2151–61.
15. Cetişli NE, Kahveci M, Işık S, Hacılar A. Postpartum contraceptive choice and attitudes of women. JAREN. 2020;6:67–72.
16. Random.org. (1998). Date of access (31.01.2023): https://www.random.org/integers/?num=148%26;min=1%26;max=2%26;col=1%26;base=10%26;format=html%26;rnd=new
17. Consort. (2010). Date of access (05.05.2023): https://www.equator-network.org/reporting-guidelines/consort/
18. General Directorate of Public Health of the Turkish Ministry of Health, Department of Gynecological and Reproductive Health. Reproductive Health Programs, https://hsgm.saglik.gov.tr/tr/programlar-2/ureme-sagligi-programlari.html
19. Republic of Turkey Ministry of Health. General Directorate of Maternal and Child Health and Family Planning Guide https://ekutuphane.saglik.gov.tr/Yayin/433
20. Lawshe CH. A quantitative approach to content validity. Pers Psychol. 1975;28(4).
21. Polit DF, Beck CT, Owen SV. Is the CVI an acceptable indicator of content validity? Appraisal and recommendations. RINAH. 2007;30(4):459–67.
22. Polit DF, Beck CT. The content validity index: are you sure you know what's being reported? Critique and recommendations. RINAH. 2006;29(5):489–97.
23. Örsal Ö. (2006). Developing Scale Which Is Measurement Attitude About Family Planning in Ankara Municipatia Area. [Unpublished doctoral dissertation]. University of Hacettepe.
24. Erenoğlu R, Şekerci YG. Effect of training program given to the students upon family planning attitudes: a semi-experimental study. Cukurova Med J. 2020;45(3):840–50.
25. Mahamed F, Parhizkar S, Shirazi AR. Impact of family planning health education on the knowledge and attitude among Yasoujian women. Glob J Health Sci. 2012;4(2):110–8.
26. Anderson SE, Frerichs, Kaysin A, Wheeler SB, Halpern CT, Lich KH. Effects of two educational posters on contraceptive knowledge and intentions: a randomized controlled trial. Obstet Gynecol. 2019;33(1):53–62.
27. Thongnopakun S, Pumpaibool T, Somrongthong R. The effects of an educational program on knowledge, attitudes and intentions regarding condom and emergency contraceptive pill use among Thai female university students. J Health Res. 2018;32(4):270–8.
28. Seidu AA, Ameyaw EK, Ahinkorah BO, Leonard B, Samuel D, Augustine A, John KG. Sexual and reproductive health education and its association with ever use of contraception: a cross-sectional study among women in urban slums, Accra. Reprod Health. 2022;19(7):1-10 https://doi.org/10.1186/s12978-021-01322-5
29. Ejder Apay S, Nazik E, Özdemir F, Pasinlioğlu T. The determination of the behaviors about family planning of the women. J Anatolia Nurs Health Sci. 2011;13(3):1–7.
30. Tezel A, Gönenç İ, Akgün Ş, Karata DÖ, Yıldız TA. Attitudes towards family planning of women and affecting factors. J Anatolia Nurs Health Sci. 2015;18(3):181–8.
31. Eryılmaz N, Ege E. The attitudes of women towards family planning and related factors in the postpartum period. J Hum Sci. 2016;13(2):3389–401.
32. Elizabeth G, Kristy MH, Ayaga B, Patrick OA, Caesar A, David C, Iqbal S. The impact of a personalized, community-based counselling and referral programme on modern contraceptive use in urban Ghana: a retrospective evaluation. Health Policy Plan. 2021;35(10):1290–9.
33. Wasswa R, Kabagenyi A, Ariho P. Multilevel mixed effects analysis of individual and community level factors associated with modern contraceptive use among married women in Uganda. BMC Public Health. 2021:211457. https://doi.org/10.1186/s12889-021-11069-0
34. Hackett K, Henry E, Hussain I, Khan M, Feroz K, Kaur N, Sato R, Soofi S, Canning D, Shah I. Impact of home-based family planning counselling and referral on modern contraceptive use in Karachi, Pakistan: a retrospective, cross-sectional matched control study. BMJ Open. 2020;10(9):23.
35. Mruts KB, Tessema GA, Dunne J, Gebremedhin AT, Scott J, Pereira GF. Does family planning counselling during health service contact improve

postpartum modern contraceptive uptake in Ethiopia? A nationwide cross-sectional study. BMJ Open. 2022;12(5):10. List of abbreviations.

Publisher's note