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The effect of motivational interviewing on attitude and intention for childbearing in healthcare provider women

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Abstract

Background Attitude Towards Fertility and Childbearing (ATFC) is one of the main determinants of fertility behavior. Implementing counseling and training programs to improve women's attitudes can promote empowerment and childbearing. Therefore, the present study aimed to determine the effect of motivational interviewing on the attitude and intention for childbearing in healthcare provider women.

Methods This randomized clinical trial was conducted among female healthcare providers in Fereidoonshahr. A total of 64 women were selected through convenience sampling and assigned to either the intervention group ($n=32$) or the control group ($n=32$). The intervention group participated in five motivational interview sessions. Both groups completed the Miller's Attitude Towards Childbearing Questionnaire and Childbearing Intent Questionnaire at three time points: baseline, immediately after the intervention, and one month later. The data were analyzed using SPSS16 with Chi-square tests, repeated measures, and independent t-tests.

Results The scores of attitudes towards childbearing ($P<0.01$) and childbearing intentions ($P<0.01$) were significantly higher in the intervention group than in the control group immediately and one-month after the intervention. In addition, the frequency of childbearing intentions increased in the intervention group.

Conclusions The use of the motivational interviewing method in women providing health care services is associated with an improvement in attitude toward and intention for childbearing. Hence, it is recommended that this cost-effective method be used for childbearing counseling by health service providers.

Trial registration IRCT Registration Number: IRCT20230308057654N1, registered on 2023–03-16 (https://irct.behdasht.gov.ir/trial/69108).

Keywords Attitude, Motivational interviewing, Childbearing, Counseling, Fertility

Plain English summary

Attitude Towards Fertility and Childbearing (ATFC) is one of the main determinants of fertility behavior. Implementing counseling and training programs to improve women's attitudes can promote empowerment and childbearing. Therefore, the present study aimed to determine the effect of motivational interviewing on the attitude and intention for childbearing in healthcare provider women. This randomized clinical trial was conducted among female healthcare providers in Fereidoonshahr. A total of 64 women were selected through convenience sampling and assigned

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to either the intervention group ($n=32$) or the control group ($n=32$). The intervention group participated in five motivational interview sessions. Both groups completed the Miller's Attitude Towards Childbearing Questionnaire and Childbearing Intent Questionnaire at three time points: baseline, immediately after the intervention, and one month later. The scores of attitudes towards childbearing and childbearing intentions were significantly higher in the intervention group than in the control group immediately and one-month after the intervention. In addition, the frequency of childbearing intentions increased in the intervention group. The use of the motivational interviewing method in women providing health care services is associated with an improvement in attitude toward and intention for childbearing. Hence, it is recommended that this cost-effective method be used for childbearing counseling by health service providers.

Background

From a demographic perspective, fertility is the most important determinant of population fluctuation. Thus, population policies in most countries are applied around the axis of fertility reduction or increase [1]. Fertility patterns have changed in many countries, and delayed childbearing has become prevalent. This pattern of childbearing in many countries has exerted a negative impact on the overall fertility rate. According to the United Nations' 2017 report on world population prospects, almost half of the world's population lives in countries with fertility below replacement levels [2]. Throughout the world, the fertility trend has been decreasing, and the total fertility rate has diminished [3], decreased from 6.3 in 1986 to 1.98 in 2000 and to 1.62 in 2018 [4]. Iran is a developing country that has experienced a sharp decrease in fertility [2]. Studies in Iran indicate that the total fertility rate has decreased in a descending trend from about 7.7 children per woman in 1966 to 1.4 in 2016, based on the latest census [5, 6].

Attitude Towards Fertility and Childbearing (ATFC) is one of the main determinants of fertility behavior [7]. The more positive the attitude of parents towards childbearing, the higher their desire for childbearing and the greater the number of children they have [8]. Today, reducing the tendency toward childbearing is one of the challenges faced by societies, and Iran is no exception. Hence, to avoid the consequences of a delay in childbearing, it is possible to overcome these consequences to some extent by identifying attitudes towards fertility and childbearing and using effective interventions [9]. The intention to have more children is a strong predictor of future fertility behavior [10]. In this regard, the implementation of consultation and educational programs to improve attitudes and promote positive mental norms can play a major role in increasing women's empowerment and child bearing [11].

Motivational interviewing is a counseling approach that fosters behavioral changes by stimulating internal motivation, uncovering, and addressing doubts and hesitancy [12]. Motivation acts as an internal force that drives attitude changes [13]. Given the importance of women's attitudes, especially those of healthcare providers who serve as effective role models in promoting childbearing within the community, this study was designed. Additionally, improving the attitudes of female healthcare providers can enhance the services they offer, thereby encouraging more women in society to consider childbearing [14]. Considering the decline in childbearing rates in various societies, including Iran, and the significance of motivational approaches in behavior change, this research aimed to determine the impact of motivational interviewing on attitudes and intentions towards childbearing among female healthcare providers.

Methods

Research design and participants

This experimental study employed a parallel clinical trial method and was conducted with a pre-test, post-test, and follow-up design between April 2023 and June 2023. The statistical population consisted of female healthcare providers in the health and treatment network of Fereidoonshahr in Isfahan, Iran.

The inclusion criteria were: female healthcare personnel (hygienists, paramedics, assistant nurses, nurses, midwives, anesthesia and operating room technicians, laboratory science technicians, radiologists, health technicians, and physicians) of childbearing age (20 to 45 years), who provided informed consent, were married, used contraceptive methods, and had no children or one to two children. The exclusion criteria were: participation in a similar relevant training course during the study, the presence of any absolute contraindication to pregnancy, mental illnesses (such as schizophrenia, severe depression, psychosis, etc.), being under drug treatment based on medical records or self-reports, use of any tobacco or drug abuse, and experiencing stressful events in the past six months, such as emigration, divorce, or the death of relatives.

The sample size was estimated to be 56 women using G-POWER based on data from Oshrieh

et al.'s study [15]. To account for a 15% attrition rate, 64 participants (32 in each group) were selected $(\alpha = 0.05, z_{\alpha/2} = 1.96, \mu_{1=16,47}, \mu_2 = 17,8, \delta_1 = 1,25, \delta_2 = 2,1)$.

$$n = \frac{\left(Z_{1-\frac{\alpha}{2}} + Z_{1-\beta}\right)^2 (\delta_1^2 + \delta_2^2)}{(\mu_1 - \mu_2)^2}$$

Sampling and randomization

For sampling, 100 female healthcare providers from 4 health centers and 27 health houses covered by the Central Health Center of Fereidoonshahr were selected using a convenience sampling method. A midwife invited 100 individuals to participate in the research by phone, and 64 were deemed eligible for the study (Fig. 1). Two midwives participated in the random allocation process. Random allocation to the control or intervention groups was performed using 64 cards marked as A or B. Each participant drew a card from an envelope to determine their assigned group. To ensure concealment, both the participant and midwife performing the random assignment were unaware of which group each card represented. Once the groups were determined, each participant was referred to the first midwife to receive either the control or intervention.

Intervention

In the intervention group, participants were enrolled and counseled using the motivational interviewing approach through the Eitaa messenger by a Master of science (MSc) student counseling in midwifery who had a specialized certificate in motivational interviewing (first author). The sessions were supervised and spanned five 45-min sessions, held once a week. The intervention began on March 21, 2023, and concluded on June 15, 2023, covering a period of three months. The intervals between sessions were adjusted to ensure that the participants could fully benefit from each session and had ample time for feedback and improvement. In addition, a childbearing training pamphlet was provided to the participants. The content and details of the techniques used in the motivational interviews are presented in Table 1.

The contents of the sessions included the following: exploring the positive and negative aspects of maintaining and changing reproductive behavior; understanding how changes occur in attitudes and intentions for childbearing and reproductive behavior of clients; learning how to influence changes in others; brainstorming the short-term and

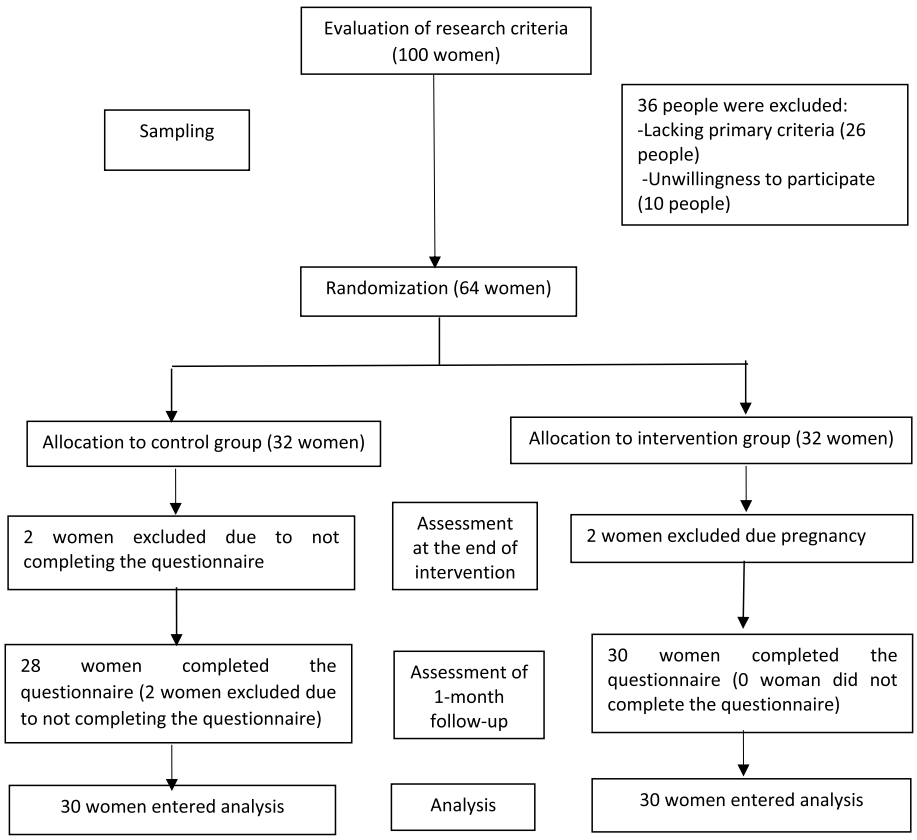

Fig. 1 Consort diagram

Table 1 The content of motivational interview sessions

Sessions	Content of sessions
First	There was a discussion about the objectives of the research and doubts and hesitations in the field of fertility and their discovery, and the participants were requested to take notes from each session and share the information with their husbands
Second	Discovering the positive and important principle of maintaining and changing reproductive behavior, proposing issues such as changing attitudes and intention to have children and reproductive behavior, how to change other people, etc., checking, ensuring, changing priorities, and external or internal motivations regarding attitudes and intention to have children. They were asked to think about the stages of behavior change that were taught and to say in which stage of reproductive behavior change they were
Third	Definition of values and practice of prioritizing values, specifying the conflict between values and current behavior, reducing the chances of fertility with the passage of time, practicing the driving force or the engine of change, becoming familiar with the rules and facilities regarding pregnancy and breastfeeding, and retirement of working women in the public sector according to youth population law. The participants were asked to prepare the values worksheet and determine the most valuable thing for them and the behaviors that harmed the desired value after prioritizing the values
Fourth	Practice balancing decision-making about internal or external motivations and practicing the mental precipitation of profits and losses in external and internal motivations, reframing and defining the client's failures from her own perspective. After becoming familiar with the concept of advantages and disadvantages, the participants were asked to complete the worksheet related to the merits and demerits of reproductive behavior
Fifth	Summoning the personal capabilities of the clients, checking the list of goals written in the first session, answering all questions, summarizing the exercises of the previous sessions in the form of perspective exercises, and preparing to start the fertility behavior change program

long-term merits and demerits of childbearing; examining the significance, confidence, priorities, and external or internal motivations for changing attitudes and intentions towards childbearing; defining values and practicing value prioritization; identifying conflicts between values and current behavior; understanding the decrease in fertility chances over time; becoming familiar with rules and facilities regarding pregnancy, breastfeeding, and retirement for women employed in the governmental sector according to the population youth law; practicing balanced decision-making about internal or external motivations; brainstorming the merits and demerits of external and internal motivations; and reframing and redefining the client's failures from their own perspective. Additionally, the motivational interview sessions incorporated the following techniques: behavior control in various situations, brainstorming practice, balanced decision-making, vision outlining, the circle of preparation for change, and increasing contrast between values and current behaviors. A more detailed breakdown of the intervention sessions is provided in Appendix.

Additionally, the educational pamphlet was provided to the intervention group during the first session. Study questionnaires were completed immediately after the intervention and one month later by participants. The primary outcome measured was attitudes towards childbearing, while the secondary outcome was the intention for childbearing. It should be noted that this study adheres to CONSORT guidelines [20].

Data collection tools

The data collection instruments used in this study included a sociodemographic questionnaire, Miller's Attitude Towards Childbearing Questionnaire, and a researcher-designed Childbearing Intention Questionnaire.

Sociodemographic questionnaire

This questionnaire included questions on age, spouse's age, duration of contraceptive use, appropriate age interval between children, education level, spouse's education level, economic status, childbearing intention, and contraceptive method.

Miller's attitude towards childbearing questionnaire

The original version of Miller's (1995) Attitude Towards Childbearing Questionnaire consists of 27 items [16, 17]. It was translated into Persian in 2012 by Khadivzadeh et al., and 7 items with a correlation coefficient below 0.3 were removed [8]. The Persian version contains 20 items and is scored on a 5-point Likert scale (1 = completely disagree to 5 = completely agree), with a total score ranging from 20 to 100. Higher scores indicate a more favorable attitude. The validity of this questionnaire was confirmed by Kord Zangeneh et al. (2018) in a cross-sectional study, and its reliability was supported with a Cronbach's α coefficient of 0.88, indicating good internal consistency [9]. Additionally, Khadivzadeh et al. (2023) assessed the psychometric properties of the Persian version of Miller's Attitude Towards Childbearing Questionnaire among Iranian men and women, finding high Cronbach's alpha coefficients for positive motivation (0.94) and negative motivations (0.85) [18]. Shoaee et al. (2020) also confirmed the good construct validity and reliability of the Persian and English versions of the childbearing motivation questionnaire [19].

Researcher-made childbearing intention questionnaire

This questionnaire used open-ended questions to investigate intentions for childbearing, including: do you intend to have a child, if your answer is yes, when do you plan

to have a child, do you want to stop using contraceptive methods, in your opinion, what factors influence your intention for childbearing, how many children would you like to have.

Statistical analysis

After collecting the information, data was analyzed using SPSS software version 16 (IBM Corporation, New York, USA) with both descriptive and analytical statistics. Initially, the normality of quantitative variables was assessed using the Shapiro–Wilk test. Nominal variables were compared between two groups using Fisher's exact test and the Chi-square test, while the independent t-test was used to compare normal quantitative variables between the groups (intergroup). For intra-group tests and comparisons across the three stages—before, immediately after, and one month after the intervention—analysis of variance with repeated measures was employed for normal variables. A *p*-value of less than 0.05 was considered statistically significant.

Result

Out of 100 eligible women invited to the study, 64 accepted the invitation. Two participants in the intervention group were excluded from the study due to pregnancy during the study. Additionally, four participants in the control group were excluded for not completing the questionnaires. This resulted in 30 participants in the intervention group and 28 participants in the control group remaining in the study (Fig. 1). Based on the results, there were no significant differences between the two groups in terms of sociodemographic characteristics (Tables 2 and 3).

The independent t-test showed no significant difference between the mean scores of attitudes towards childbearing in the intervention and control groups before the study ($P=0.105$). However, the difference between the two groups was significant immediately after the intervention ($P<0.01$) and during the one-month follow-up ($P<0.01$), with the intervention group having a higher attitude score than the control group (Table 4).

Based on the results of the Repeated Measure analysis of variance, the score of attitudes towards childbearing was significantly different between the two intervention and control groups before the intervention, immediately after the intervention, and one month after the intervention ($P<0.001$). Besides, based on Repeated Measure analysis of variance test, scores of attitudes towards childbearing increased significantly immediately after and one month after the intervention compared to the baseline; nonetheless, a significant decrease was observed immediately after intervention compared to the follow-up period (one month after the intervention) indicating that over time, the score of the attitude towards childbearing has decreased, but it is still significantly different from the baseline ($P<0.001$) (Table 5).

Table 2 Comparison of Sociodemographic quantitative characteristics between the two groups before the intervention

Variable	Intervention group		Control group		*P-value
	Mean	SD	Mean	SD	
Age	33.70	4.66	35.50	6.80	0.26
Spouse's age	36.60	4.90	37.80	7.04	0.46
Duration of contraceptives use	57.40	47.90	51.90	43.70	0.65
Appropriate age interval between children	4.10	1.90	3.60	1.10	0.34

* Independent t-test

Based on the results of the Fisher exact test, there was no significant difference in the frequency of childbearing intentions between the intervention and control groups before the study ($P=0.16$). However, the difference between the two groups became statistically significant immediately after the intervention ($P<0.01$) and during the one-month follow-up period ($P<0.01$), with the intervention group showing a higher intention for childbearing compared to the control group (Table 6).

Table 7 presents the frequency distribution of variables related to the intention for childbearing in the intervention and control groups before the study, immediately after the intervention, and one month later. The frequency of the wife's attitudes towards childbearing, intention for childbearing, desire to discontinue contraceptive methods, and the desired number of children increased in the intervention group immediately after the intervention and one month later compared to baseline. This increase was more pronounced immediately after the intervention. Additionally, based on the results, the factors affecting the intention for childbearing in both groups were ranked as follows: financial and economic issues, political and social issues, psychological and social maturity of couples, occupational support, community support, and the influence of surrounding people (Table 7).

Discussion

This study was conducted to determine the effect of motivational interviewing on the attitudes and intentions of female healthcare providers. The results demonstrated that motivational interviewing effectively influenced the attitudes and intentions of these women towards childbearing.

Table 3 Comparison of sociodemographic qualitative characteristics between the two groups before the intervention

Group	Description	Intervention group		Control group		*P-value
Variable		F	%	f	%	
Education level	Below Bachelor of Science (BS)	*2	6.7	*2	7.1	0.263
	BS	22	73.3	24	85.8	
	Above BS	6	20	*2	7.1	
Spouse's education level	Below Bachelor of Science (BS)	6	20	7	25	0.461
	BS	15	50	15	53.6	
	Above BS	9	30	6	21.4	
Spouse's Occupation	Governmental	15	50	18	64.2	0.239
	Self-employed	13	43.3	9	32.2	
	Other	*2	6.7	*1	3.6	
Accommodation status	Rented/mortgaged	6	4.21	8	26.7	0.723
	Owner	22	78.6	19	63.3	
	With parents	0.0	0.0	*3	10	
Economic status	Sufficient	24	89.3	25	89.2	0.473
	Below sufficient	6	10.7	*3	10.8	
Childbearing intention	Yes	*2	6.7	*4	14.3	0.340
	No	28	93.3	24	85.7	
Contraceptive method	Natural, withdrawal	19	63.3	7	25	0.094
	Condom	8	26.8	17	61	
	Oral hormones	*1	3.3	*2	7	
	Short-acting agents	*2	6.6	*2	7	
Family dimension	2	13	43.4	10	35.6	0.731
	3	10	33.3	9	32.2	
	4	7	23.3	9	32.2	
Rooms available	Less than 2	25	83.3	24	85.7	1.00
	More than 2	5	16.7	*4	14.3	
Your ideal number of children	1	13	43.4	12	42.9	0.971
	2	17	56.6	16	57.1	
In the case of support by government, Iranian families will have more children	Yes	24	80	20	71.4	0.565
	No	*4	13.3	6	21.4	
	Indifferent	*2	6.7	*2	7.2	

* Chi-square & Fisher's exact test

Table 4 Comparison of mean scores of attitudes between the intervention and control groups before the intervention, immediately after, and one month after the intervention

Test	Group	Mean ± SD	Mean difference	SD	T	*P-value
Before intervention	Intervention	49.27 ± 5.28	1.02	2.07	0.493	0.105
	Control	50.28 ± 9.68				
Immediately after Intervention	Intervention	83.03 ± 4.96	22.25	2.45	9.06	< 0.001
	Control	60.78 ± 12.07				
One month after intervention	Intervention	73.3 ± 4.50	16.59	1.72	9.62	< 0.001
	Control	56.71 ± 8.01				

* Independent T-test

Few interventional studies have examined the effect of motivational interviewing on childbearing. The study by Rezaee et al. (2022) showed that group counseling based on motivational interviewing was effective in promoting childbearing motivation among female students [17]. Additionally, Osherieh et al. (2019) conducted a

Table 5 Comparison of attitudes scores towards childbearing between intervention and control groups

Group Variable	Control group Mean ± SD	Intervention group Mean ± SD
Before intervention	50.28 ± 9.68	49.27 ± 5.28
Immediately after intervention	60.78 ± 12.07	83.03 ± 4.96
One month after intervention	56.71 ± 8.01	73.3 ± 4.50
F	18.602	665.86
**P*-value	< 0.001	< 0.001

* Repeated Measure

randomized controlled trial to determine the effect of a hidden curriculum on students' childbearing motivations and concluded that the intervention reduced negative motivations among schoolgirls [15].

Fertility motivation is a complex and persistent issue influenced by cultural, religious, and behavioral factors [21–23]. The purpose of motivational interviewing is to identify motivational factors that maintain or change thoughts and behavior [24]. Through the motivational interviewing approach, people's motivation increases as they gain knowledge about the advantages and disadvantages of change. With the help of a consultant, they make informed decisions and implement them [25]. Motivational interviewing is a psychological and counseling approach that enhances internal and external motivations and improves people's attitudes [12].

In a trial study, Hosseini Haji et al. (2020) investigated the effect of motivational interviewing on women's knowledge, attitudes, and intentions regarding choosing natural vaginal delivery after Cesarean Section (CS). The study concluded that motivational interviewing increases awareness and improves attitudes towards natural vaginal delivery after cesarean Sect. [26]. Mirkarimi et al. (2015) explored the effect of motivational interviewing on women's weight loss based on the motivational theory of protection and found that it effectively increases attitude scores [27]. Furthermore, Shakiba et al. (2020) concluded that motivational interviewing can be a valuable tool in changing attitudes and reducing the rate of unnecessary cesarean sections among pregnant women in a single-blind clinical trial study [28].

Childbearing motivations are the main drivers of reproductive behaviors [29]. Providing counseling in the field of reproductive and childbearing can increase women's awareness about childbearing and reproductive health, thereby promoting positive population growth [30, 31]. Additionally, Khadivzadeh et al. (2018) conducted a cross-sectional study on the attitudes of young men and women towards childbearing in Mashhad, Iran. They concluded that attitudes towards childbearing among young people on the verge of marriage are not very favorable, highlighting the necessity of comprehensive educational programs to strengthen the positive views of both women and men towards childbearing [8].

The results of the present study showed that the intention for childbearing increased in the intervention group immediately after the intervention, and this increase remained stable one month later. Attitudes towards fertility and childbearing are major determinants of fertility behavior [32]. The more positive people's attitudes towards childbearing, the greater their intention for childbearing and the higher the number of children they have [31, 33]. Consequently, in the present research, given the improvement in attitudes towards childbearing in the intervention group, the frequency of the intention for childbearing was also higher in this group compared to the control group.

The findings of the present study further revealed that the factors affecting the intention for childbearing in both groups included financial and economic issues, political and social issues, psychological and social maturity of the couple, occupational support, and support from the community and surrounding people. These findings align with previous studies. Hashemzadeh et al. (2021) conducted a systematic review entitled "The Intention for Childbearing and Factors Related to It," which aimed to provide comprehensive information about the main factors that determine the intention for childbearing in adolescents.

Table 6 Comparison of frequency of intention for childbearing between intervention and control group before the study, immediately after, and one month after the intervention

Time		Intervention group ($n=30$)		Control group ($n=20$)		**P*-value
		F	%	f	%	
Before intervention	Yes	3	10	3	10.7	0.16
	No	27	90	25	89.3	
Immediately after intervention	Yes	20	66.7	4	14.3	< 0.01
	No	10	33.3	24	58.7	
One month after intervention	Yes	15	50	2	7.1	< 0.01
	No	15	50	26	92.9	

* Fisher's exact test

Table 7 Frequency distribution of variables related to the intention for childbearing in intervention and control groups before the study, immediately after, and one month after the intervention

Group Variable		Intervention group f(%)			Control group f(%)		
		Before intervention	Immediately after intervention	One month after intervention	Before intervention	Immediately after intervention	One month after intervention
Husband's attitude towards childbearing	Disagree	30(100)	22(73.3)	25(83.3)	28(100)	28(100)	28(100)
	Agree	0(0)	8(26.7)	5(16.7)	0(0)	0(0)	0(0)
Intention for childbearing	Yes	3(10)	20(66.6)	15(50)	3(10.7)	4(14.3)	2(7.2)
	No	27(90)	10(33.3)	15(50)	25(89.3)	24(85.7)	26(92.8)
Time of intention for childbearing	Before 24 months	1(33.3)	13(65)	9(60)	1(33.3)	1(33.3)	1(33.3)
	After 24 months	2(66.7)	7(35)	60(40)	2(66.7)	2(66.7)	2(66.7)
Intention for discontinuing contraceptive method	Yes	8(26.6)	20(66.7)	15(50)	3(10.7)	3(10.7)	1(3.50)
	No	22(73.4)	10(33.3)	15(50)	25(89.3)	25(89.3)	27(96.5)
Desired number of children	0	1(3.4)	0(0)	0(0)	0(0)	0(0)	0(0)
	1	6(20)	4(13.4)	5(16.7)	3(10.7)	4(14.3)	4(14.3)
	2	23(76.6)	18(60)	25(83.3)	25(89.3)	24(85.7)	24(85.7)
	3	0(0)	8(26.6)	0(0)	0(0)	0(0)	0(0)
Factors affecting intention for childbearing	Financial and economic issues	25(83.3)	27(90)	28(93.3)	23(82.1)	26(92.8)	25(89.2)
	Political and social problems	2(6.7)	1(3.33)	0(0)	1(3.57)	1(3.57)	1(3.57)
	Couple's mental and social maturity	1(3.33)	0(0)	0(0)	2(7.14)	1(3.57)	0(0)
	Occupational support	1(3.33)	1(3.33)	0(0)	1(3.57)	0(0)	1(3.57)
	Social and surrounding support	1(3.33)	1(3.33)	0(0)	1(3.57)	0(0)	1(3.57)

They concluded that in developing countries, economic and social factors, such as employment, accommodation, emotional maturity, and financial issues, affect women's fertility intentions and decision-making [34].

Additionally, Zhu et al. (2022) conducted a cross-sectional study aimed at investigating the desire for childbearing and related factors among couples with respect to having a second and third child. In this study, 1026 couples who had one or two children were randomly selected for the survey. The results indicated that economic problems were the most significant factor affecting fertility [35]. The present study is similar to Zhu's study [35] in determining the factors affecting the intention and willingness for childbearing; however, it differs in terms of study type and statistical population. Additionally, Bagi (2022) conducted a study aimed at determining the fertility tendencies of newly married couples in Iran based on data from the National Marriage Survey by the country's civil registration organization in 2016 and 2017. The study concluded that the most important reasons for childlessness were the economic costs of children and a lack of interest in having children [36].

The results of this research show that counseling based on motivational interviewing has improved the attitudes and intentions for childbearing among female healthcare providers. Attitudes towards fertility and childbearing are major determinants of fertility behavior [7]. Given the global decline in fertility rates and the ensuing economic and social challenges, it is crucial to create conditions that positively influence women's attitudes towards childbearing. One policy to increase population growth is providing childbearing counseling by healthcare providers. Therefore, improving the attitudes of female healthcare providers, who serve as role models in promoting childbearing at the community level, can effectively encourage other women and enhance fertility counseling services.

Limitations and strengths

One of the limitations of this study was the inability to blind the participants. As the women in each group were aware of the type of intervention they received, this could have unintended effects on the research results and introduce bias in the responses. Despite efforts to select an appropriate sample, this study was conducted with the mentioned sample size due to resource constraints, such as financial limitations and time restrictions. To confirm the results and increase generalizability, it is recommended that this research be conducted on a larger population. Additionally, the use of convenience sampling might limit

the generalizability of the findings. Future studies could benefit from employing more random or stratified sampling techniques to enhance the representativeness of the sample. The strengths of this research included adherence to all principles of clinical trials (e.g., random allocation and concealment of allocation) and the completion of questionnaires by the researcher. Furthermore, during the counseling sessions, the native language of the participants was used to facilitate easier communication.

Conclusions

According to the findings of this study, motivational interviewing can improve attitudes and intentions towards childbearing. It should be noted that attitudes towards fertility and childbearing are major determinants of fertility behavior; the more positive people's attitudes towards childbearing, the greater their intention for childbearing and the number of children they have. Given the importance of childbearing in the country, this counseling technique can be used to prepare individuals for behavior change and encourage them to decide to have more children. Based on the study's findings, suggestions for future research include conducting additional behavioral change interventions to enhance motivation and intention for childbearing among female healthcare providers. It is also recommended that future studies involve a longer follow-up period to provide more insight into the long-term effects of interventions on fertility attitudes.

Appendix

A more detailed breakdown of the intervention sessions

Sessions	Goals	The content of the session	Homework
First	- Getting to know the researcher and the research process, - filling out the first stage questionnaire and – - filling out the informed consent form.	Getting acquainted and preliminary talks, determining the number of sessions and the duration of each session and the frequency of sessions and the rules and goals of the sessions, completing the pre-test form, determining the list of individual goals for participating in the counseling sessions. Note and pen to each participant.	The participants were asked to write down the rules and goals of the group and convey the contents of each meeting to their spouses.
Second	- Learning behavior and how to change behavior - Thinking about the benefits and harms of changing behavior	Discovering the positive and important principle of maintaining behavior and changing reproductive behavior, proposing issues such as changing attitudes and intention to have children and reproductive behavior, how to change other people, etc., checking, ensuring, changing priorities and external or internal motivations regarding attitudes and Intention to have children. They were asked to think about the stages of behavior change that were taught and to say in which stage of reproductive behavior change they are.	After identifying the stages of behavior change, the participants were asked to note down some examples of health-related behavior and write about the behavior at which stage of the behavior change they are and practice placing the benefits and losses of childbearing.
Third	Learning to define values and note down the values of each person's life based on priority	Definition of values and practice of prioritizing values, specifying the conflict between values and current behavior, reducing the chances of fertility with the passage of time, practicing the driving force or the engine of change, getting familiar with the rulings and facilities regarding pregnancy and breastfeeding and retirement of working women in public sector according to the youth population law. The participants were asked to prepare the values worksheet and determine the most valuable thing for them and the behaviors that harm the desired value after prioritizing the values.	Participants were asked to fill out the values worksheet and determine what is most valuable to them and determine the behaviors that harm the person's desired value.

Sessions	Goals	The content of the session	Homework
Fourth	Learning the advantages and disadvantages of motivations and defining failures	Practice balancing decision-making about internal or external motivations and practicing the mental precipitation of profits and losses in external and internal motivations, reframing and defining the client's failures from her own point of view. After getting familiar with the concept of advantages and disadvantages, the participants were asked to complete the worksheet related to the merit and demerits of reproductive behavior.	The participants were asked to fill in the worksheet related to reproductive behavior (determining fertility gains and losses).
Fifth	General summarization of the contents and clarification of ambiguities and review of objectives	Summoning the personal capabilities of the clients, checking the list of goals written in the first session, answering all questions, summarizing the exercises of the previous sessions in the form of perspective exercise and preparation to start the fertility behavior change program.	The participants were asked to write down the summary of the sessions

Abbreviations

ATFC Attitude Towards Fertility and Childbearing
MSc Master of Science

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Authors' contributions
F.ZM. and A.R. wrote the main manuscript text. A. R, F.ZM, M.D. involved in data collection supervising, acquisition of analysis, interpretation of data, and editing the manuscript. M.T. and M.D. involved in designing the intervention, interpretation of data, and editing the manuscript. All authors reviewed the manuscript.

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Data availability
Data and material are available on request from the corresponding author.

Declarations

Ethics approval and consent to participate
The approval was obtained from the Committee of Ethics in Shahid Sadoughi University of Medical Sciences in Yazd, Iran (IR.SSU.REC.1401.110). This clinical trial was registered on 2023–03-16 (IRCT20230308057654N1) in the Iranian Registry of Clinical Trials. Informed consent was obtained from all participants.

Consent for publication
Not applicable.

Competing interests
The authors declare no competing interests.

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