Original Article

The Effect of an Educational Program Based on Behavioral Intention Model on Childbearing in Women During the Covid 19 Pandemic

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Abstract

Background: Currently, fertility and childbearing rates in Iran are below the replacement level (1.2 children), and Iranian families have a low propensity to have children. The COVID-19 pandemic will also have a negative impact on the decision of couples to have children. The present study was conducted with the aim of investigating the effectiveness of an educational program on women's childbearing intention under the conditions of the COVID-19 pandemic. **Materials and Methods:** This study was a clinical trial with a pretest–posttest design, conducted on 80 women (control group = 40 and intervention group = 40) in comprehensive health centers in 2019. The educational program was delivered to the intervention group in 3 sessions. The data collection tools included the Attitudes to Fertility and Childbearing Scale (AFCS), Demographic Information Questionnaire, and researcher-made fertility intention questionnaire. Data were analyzed using *t*-test, Mann–Whitney, Chi-square test, ANOVA, Bonferroni *post hoc* test, and Wilcoxon test. **Results:** The women in the intervention group were in the age range of 18 to 44 years and in the control group were in the age range of 19 to 44 years. The results showed that the mean scores of attitude toward fertility and intention to have children after training were significantly different between the two groups. However, after the training, it was significantly higher in the intervention group than in the control group ($F_{1,67} = 1037$, $p < 0.001$). **Conclusions:** It seems that the implementation of the use of theoretical models can be effective in the informed decision of families, especially women, for childbearing.

Keywords: *Attitude, childbearing, COVID-19, intention, reproductive behavior, women*

Introduction

From a demographic point of view, fertility and childbearing are known to be the most important phenomena determining population fluctuations. Therefore, population policy in most countries is mainly concerned with reducing or increasing fertility.[1] The continuous reduction of the birth rate and the transition from natural fertility to controlled fertility will gradually shift the age structure of the population from youth to old age. Therefore, the population age pyramid, which was once historically wide-based, has undergone a transformation as a result of declining fertility over the past two decades, resulting in a noticeable dent at its base.[2] Iran's population has grown steadily over the past half century, but in the last decade, the fertility rate in Iran has fallen below the replacement level; this is the largest and fastest decline in fertility ever recorded.[3,4]

The Total Fertility Rate (TFR) is 4.6 in low-income countries and 1.6 in high-income countries. Currently, the overall total fertility rate in 24 provinces of Iran has been 1.2.[3,4] Important reasons for these changes in reproductive behavior include increased age of the mother at the first pregnancy, increased age of marriage, increased use of contraceptive methods, gender equality, empowerment of women in modern society and economic factors, and social factors (e.g. women's participation in labor force, women's education level, religious tendencies, family income, beliefs, individual behavior, and social norms and values).[5]

Currently in Iran, it seems that while cultural and social changes have been a more important factor in reducing fertility among the affluent class, economic factors have been a more important factor among the middle and poor classes. The

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improvement or stagnation of economic factors is not very effective in changing the attitude of the educated and wealthy classes of society toward having children. At medium and low socioeconomic levels, however, it leads to a reduction in the number of births or to illegal abortions, which is fueled by the restriction on the provision of family planning methods.[6] In addition to the couple attitudes toward having fewer children in recent years, COVID-19 appears to be a relevant crisis in all countries. COVID-19 also affects behavioral mechanisms such as health status, social distancing, and economic crisis.[7] Behavioral mechanisms are based on the couple's decision to postpone pregnancy or use alternative pregnancy methods. Postponement of pregnancy occurs in situations where infant mortality is higher[8] or when people decide to postpone pregnancy because of anxiety and psychological distress caused by the fear of their own or their spouse's illness.[9] On the other hand, isolation and staying at home provides an opportunity to spend more time with one's spouse, and improving the quality of relationships encourages people to expand their families.[10] In addition to reducing the number of marriages, the COVID-19 pandemic will also have a negative impact on the decision of couples to have children. Some couples have postponed their decision to have children because they are afraid to go to medical centers. In addition, many young couples believe that the current economic conditions, combined with the challenges of COVID 19, do not allow them to think about having children.[11]

The results of an online survey showed that more than 50% of women had changed their plans regarding the time of fertility or having more children because of the spread of the COVID-19 virus. One-third of the participating women also decided to become pregnant after the crisis period had ended or to have fewer children because of the spread of the virus and the problems they had experienced during this period.[12] These factors should therefore be taken into account when designing intervention programs aimed at increasing fertility. These interventions should aim to change people's attitudes, which will lead to changes in their behavior as well. Considering that behavioral models can be important in examining people's views on health behaviors, and also based on the studies, the behavioral intention model is one of the best models used with regard to attitudes and behaviors related to family planning. According to the assumptions of this theory, people should make their behavioral decisions based on the available logical information.[13] According to this model, the most important determinant of a person's behavior is behavioral intention, and a person's intention to perform a behavior is a combination of attitudes toward the behavior and abstract norms. This refers to those who influence a person's beliefs and usually include family, friends, health center staff, etc., who will be present at training sessions in the Behavioral Intention Training model.[14] The results of a study showed that conducting educational interventions based on TPB and providing the required information to single-child spouses is effective on their intention to reproduce. It seems that the implementation of such interventions can be effective in the conscious decision of families to have children family planning trainings based on behavioral intention variables with face-to-face methods, group training, conducting group discussions, and producing health pamphlets had an effective role in the fertility behavior of women and families.[15] Based on what was said and according to the surveys and the official statistics of the country, the tendency to have children has decreased. Moreover, given couples' fear of having sex during the pandemic and their uncertainty about the future, implementing an intervention program for women may influence their attitudes and decisions about childbearing.[16] Therefore, the present research was conducted to investigating the effectiveness of an educational program on women's childbearing intention under the conditions of the covid-19 pandemic.

Materials and Methods

This study was a clinical trial (IRCT20220515054859N1) with a pretest–posttest design that was conducted in Lorestan, Iran, in 2019. Using G*Power statistical software based on the two-way repeated measures ANOVA to perform the test at the significance level of 5% ($\alpha = 0.05$), with the test power of 80% (2. $\beta = 0$), the small effect size of $d = 0.2$, and the repetition number of 2, the sample size was calculated to be 72 participants (36 participants in each group). Considering the probable 10% drop in the samples, 40 samples were selected for each group. Inclusion criteria were willingness to participate in the research, age between 18 and 45 years old, having no mental disorder (based on the opinion of the attending physician and medical records), and no other physical disorders that could cause dysfunction, having at least primary education, being able to communicate, no previous and current participation in similar training sessions, having Iranian nationality, and being not pregnant at the time of the research. Exclusion criteria included unwillingness to continue to participate in the research, failure to attend two training sessions, the occurrence of major stressful events during the intervention, having any physical and mental problems that might prevent the person from participating in the study, and becoming pregnant during the intervention.

The data collection tools included demographic information questionnaire (age, number of children, education level, residential status, employment status, duration of marriage, pregnancy history, and abstract norm) and the Attitudes to Fertility and Childbearing Scale (AFCS), with 27 items and four subscales, which are scored based on a 5-point Likert scale ranging from completely agree[3] to completely disagree.[1] The subscale of the child as a pillar of life includes items 1, 2, 3, 4, 6, 8, 23, and 27; the subscale of the child as an obstacle includes items 14, 15, 6, 17, 18, and

19; the subscale of fertility postponement includes items 5, 7, 10, 12, and 13; and the fertility prerequisites subscale includes items 11, 20, 21, and 25. It should be noted that items 10, 111, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, and 25 have a reverse grading. In the review by Ezzat (2018), for the psychometric evaluation of this questionnaire in Persian language and to check the internal consistency of the scale, the Cronbach's alpha coefficient of the original Persian version was calculated. The Cronbach's alpha coefficient was 0.902, indicating the good internal consistency of the scale. Since four items had a lower correlation with the total score of the scale and had a negative effect on the reliability of the scale, they were removed from the Persian version and exploratory factor analysis was performed on the remaining 23 items. Moreover, the correlation coefficients of all extracted factors with each other and with the whole scale are significant at the level of $p < 0.001$, indicating the acceptable and desirable construct validity of the Persian version of the scale of attitudes toward fertility and childbearing. The minimum and maximum scores of the questionnaire are 23 and 115, respectively, with higher scores indicating more positive attitudes toward fertility and childbearing. According to the results of Ezzat's research on the psychometrics of the Soderberg questionnaire, it can be said that the Persian version of the Fertility and Childbearing Attitude Scale has good reliability and validity and can be used to evaluate attitudes toward fertility and childbearing among married women in Iran.[17] The third tool was the childbearing intention questionnaire, which included a question with the answers "infinite possibility of having a child"[6] and "infinite possibility of not having a child".[1] The maximum and the minimum obtained scores were 7 and 1, respectively.

After the project was approved by the Vice Chancellor of Research and Ethics Committee of Isfahan University of Medical Sciences, the researcher was introduced by Isfahan University of Medical Sciences to the comprehensive health centers of Lorestan University of Medical Sciences for sampling and intervention. Then, in coordination with the 7 comprehensive health centers, 80 women who met the inclusion criteria were selected using the random sampling method based on the last number of the personal ID number (odd or even number) from the SIB system. Then, their consent to participate in the research was obtained through a telephone call. Next, 40 cards with the number 1 and 40 cards with the number 2 on them were placed in a closed pocket. On the day of the face-to-face meeting, the participants were asked to choose one card randomly. The participants who were assigned number one were in the intervention group and those with number two were in the control group. Given the conditions of the COVID-19 pandemic, health protocols were followed and the participants were invited in groups of 10 so that we could determine the control and intervention groups. In the first session, which was held in the education classes of the health centers in the city of Koohdasht, the purpose of the research was explained by the researcher and informed consent was obtained from the subjects. The questionnaires were then completed by the subjects in both groups before the intervention. The questionnaires were completed under the supervision of the researcher. After completing the questionnaires, the intervention program was delivered to the women of the intervention group in 3 sessions.[18] According to the conditions of the COVID-19 pandemic, the intervention group was divided into four groups of 10 subjects and trained by observing social distancing. The classroom was disinfected before and after the session. Moreover, a thermometer was used to measure the subjects' fever as they entered the classroom and disinfectant was provided. The training sessions were held once a week for three weeks, and each session lasted 1 to 1.5 hours. All sessions were held within 1 month according to the compiled content. The content topics included the benefits and fruits of childbearing, the relationship between maternal age and childbearing, the consequences of delayed childbearing and delayed first childbearing, coronavirus, sex and childbearing during the pandemic, lifestyle modification before pregnancy, the consequences and the problems of single-child families, the consequences of the age gap between parents and children, doing prepregnancy check-ups, vitamin and folic acid intake, achieving optimal weight, check-ups and cares during pregnancy, exercise to strengthen muscles, and taking into account the menstrual cycle and ovulation time as well as women's concerns about childbearing during the COVID-19 pandemic. At the end of the sessions, the questionnaires were completed again by the two groups after 3 months Figure 1. Research procedure diagram.

Data analysis was performed using two levels of descriptive and inferential statistics. Independent *t*-test, Mann–Whitney test, Chi-square test, repeated measures ANOVA, Bonferroni *post hoc* test, and Wilcoxon test were used. Statistical analyses were performed in SPSS statistical software, version 21, and at the significance level of < 0.05.

Ethical considerations

This study was approved by the Ethics Committee of Isfahan University of Medical Sciences (code: IR.MUI.RESEARCH.REC.1400.120). The researcher explained the objectives of the study to the women. Written informed consent was obtained from all women. Participation was voluntary, and the participants had the right to withdraw at any time.

Results

In this study, the participants consisted of 80 women who had been referred to comprehensive health centers. The women in the intervention group were in the age range of 18 to 44 years, with the Mean (SD) age of

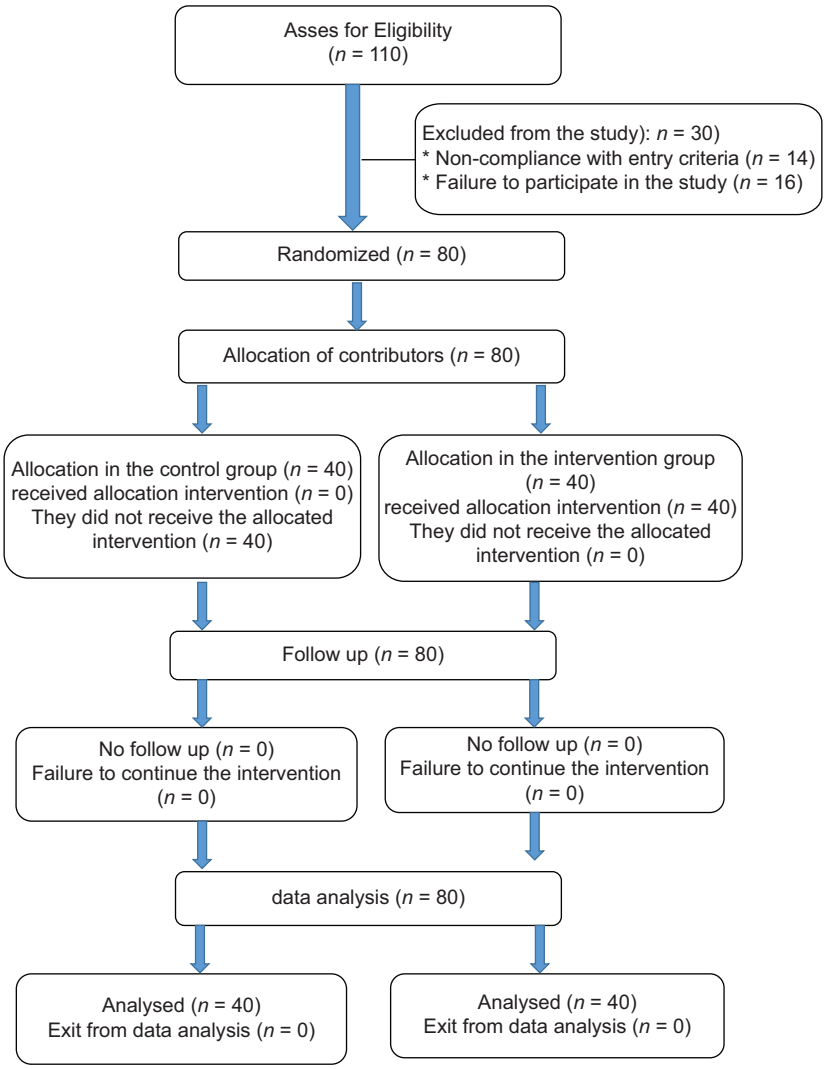

Figure 1: Research procedure diagram

31.63 (6.68) years, and the women in the control group were in the age range of 19 to 44 years, with the mean (SD) age of 33.00 (6.16) years [Table 1].

Based on the results of the repeated measures ANOVA, the effect of the intervention group was significant at the 5% error level. Therefore, the assumption that the mean of attitudes toward fertility and childbearing is equal between the two groups was rejected ($p < 0.001$). The effect of time ($p = 0.001$) and the interaction effect of group*time (change in different levels of time between the two groups) were also found to be significant ($p < 0.001$). Thus, the mean attitude scores between the two measurement phases, as well as the changes in attitudes toward fertility and childbearing between the two measurement phases between the two groups (interaction effect), were significantly different [Table 2].

Based on the results of Table 3, the Bonferroni *post hoc* test showed that there was no significant difference between the mean attitude scores of the two groups before the intervention ($p = 0.092$). However, in the posttest, the mean score for attitudes toward fertility and childbearing was significantly higher in the intervention group than in the control group ($p < 0.001$).

The results of the intragroup comparison using the Wilcoxon test showed that at the postest, the intention to have a child score of the subjects in the intervention group was significantly higher than at the pretest ($p < 0.001$), but in the control group, the intention to have a child score was not significantly different before and after the intervention ($p = 0.782$). The results of intergroup comparisons using the Mann–Whitney test indicated that there was no significant difference in the pretest childbearing intention score between the control and intervention groups ($p = 0.217$). However, at the posttest stage, the intention to have children score was significantly higher in the intervention group than in the control group ($p < 0.001$) [Table 3].

In the case of the abstract norm, the highest frequency in the intervention group with 30 subjects (75.0%) and in

the control group with 32 subjects (80.0%) was related to the spouse. This means that both groups mentioned their spouse as their abstract norm. The result of Fisher's exact test did not show a significant difference in subjective norm of women between the two groups (p = 0.253) [Table 4].

Discussion

Eighty women participated in the present study. The study showed that the educational intervention was effective in changing women's attitudes toward fertility and childbearing. Moridi *et al*.[19] (2024) reported that education based on a transtheoretical model improved women's attitudes toward childbearing. Similarly, as a result, another study revealed the positive effect of education on women's attitudes toward reproductive health.[20] Another study was carried out to investigate the effect of education on women's attitudes toward reproductive intention, and the results were consistent with those of the present study.[21] The explanation for these findings is that education can have an impact on women's attitudes toward childbearing. Informing and educating women about the benefits and fruits of childbearing can change their attitudes toward childbearing.

The results also showed that the educational intervention could affect the women's intention to have children and trigger their desire for having children. The results of a study suggested that attitudes and behavioral intentions toward dietary patterns can be improved through parental education based on the behavioral intention model of attitudes, subjective norms, and behavioral intentions.[22] It also suggested that this model be used in educational programs related to population growth policies and in the design of interventions to encourage couples to have children.[23] During the pandemic, many couples postponed their childbearing decision. The results of studies have shown that by informing women and raising their awareness of COVID-19 disease, it is possible to influence their attitudes and intentions to have children and increase their willingness to have children.[24] Changing attitudes toward having children is the most important reason for the decline in the fertility rate. Some sociologists consider changing attitudes to childbearing to be the most important reason for the decline in fertility and household size in recent decades.[25] As the results of this study showed, raising women's awareness in this area can change their attitudes and increase their childbearing intention.

The results showed that the spouses were the subjective norm in both groups. The results revealed that the husbands had the greatest influence on women's decisions about pregnancy and childbearing intention. The results indicated that after the intervention, the positive incentive to have children was significantly higher in the intervention group than in the control group, and the negative incentive was significantly lower than in the control group.[26] The results of another study also showed that the variables of social support and people around them were related to the desire to have children, showing the strength of the kinship network in Iran.[27] However, similar to the results of the present study, another study[28] confirmed the lack of relationship between social support and the intention to have children.[29] Some studies have shown that frequent contact with the family, especially with the parents, and receiving support from them increases the probability of childbearing in couples.[30,31] According to some studies conducted in Iran, the value of having children has changed in recent decades under the influence of social and cultural changes.[32,33]

Table 1: Participants characteristics in the two groups of intervention and control groups

Variable	Intervention group *n* (%)	Control group *n* (%)	Test statistics	*p*
			U=-0.7 45	0.455
Education				
High school	12 (30.0)	13 (32.5)		
diploma	10 (25.0)	15 (37.5)		
Bachelor and higher	18 (45.0)	12 (30.0)		
Total	40 (100.0)	40 (100.0)		
Job				
Employed	8 (20.0)	8 (20.0)	χ^2=0.000	1.000
Housewife	32 (80.0)	32 (80.0)		
Total	40 (100.0)	40 (100.0)		
Housing situation				
The owner	8 (20.0)	15 (37.5)	χ^2=2.99	0.084
Tenant	32 (80.0)	25 (62.5)		
Total	40 (100.0)	40 (100.0)		
Financial problems				
Yes	18 (45.0)	21 (52.5)	χ^2=0.45	0.502
No	22 (55.0)	19 (47.5)		
Total	40 (100.0)	40 (100.0)		
History of pregnancy				
Yes	39 (97.5)	35 (87.5)	χ^2=0.35	0.201
No	1 (2.5)	5 (12.5)		
Total	40 (100.0)	40 (100.0)		

Table 2: Mean score of attitude towards childbearing before and after the test in two test and control groups during the COVID-19 pandemic

Variable	Time	Mean (SD)		Group	Time	Interaction
		Intervention group	Control group			
Attitude towards childbearing	Pre test	75.02 (11.75)	70.62 (11.32)	<0.001	0.001	<0.001
	Post test	83.70 (15.11)	69.55 (10.71)			

Table 3: Comparisons of childbearing intention scores of the subjects in two intervention and control groups in pretest and posttest during the COVID-19 pandemic

Variable	Group	Mean (SD)		*p**
		Pretest	Posttest	
Intention to childbearing	Control group	4.15 (1.00)	3.60 (2.01)	0.782
	Intervention group	4.15 (2.02)	5.25 (1.25)	<0.001
	*P***	0.217	0.20	

*Based on Wilcoxon test, **based on Mann–Whitney test

Table 4: Distribution of the subjective norm of studied units in two test and control groups during the COVID-19 pandemic

Variable	Intervention group *n* (%)	Control group *n* (%)	*p**
Abstract norm			
Spouse	32 (80.0)	30 (75.0)	0.253
Mother	5 (12.50)	2 (5.0)	
Sister	0 (0.0)	0 (0.0)	
Sister-in-law	0 (0.0)	1 (2.5)	
Mother-in-law	2 (5.0)	1 (2.5)	
Friends	0 (0.0)	2 (5.0)	
Social media	1 (2.50)	4 (10.0)	
Total	40 (100.0)	40 (100.0)	

Based on Wilcoxon test

This study, like any other study, had strengths and limitations. One of the limitations of this study was that there was no intervention to educate key people such as parents, spouses, and friends. For this reason, and to address this shortcoming, it is suggested that future researchers conduct the necessary interventions with the groups that influence women's fertility intentions. In addition, the results of this study provide a basis for future research and further studies on the application of other models and theories of health education and health promotion in the field of reproductive behaviors in pandemic conditions such as the COVID-19 pandemic.

Conclusion

In accordance with Iran's demographic policy and taking into account the results of the present study, the implementation of educational interventions based on behavioral intention education programs and the provision of the necessary information to married women in special circumstances, such as the COVID-19 pandemic, may have an impact on their childbearing intentions. It seems that the implementation of such interventions can be effective in helping families, especially women, to make informed decisions about childbearing. Moreover, the effectiveness of such educational interventions can be enhanced through the use of theoretical models and frameworks in their design. Another limitation of the present study was the short-term effectiveness of the educational models. In addition, as people's attitudes to fertility change according to their circumstances, it is recommended that the educational program be continued to maintain its effect and strengthen childbearing behavior or intentions. Perhaps it can be said that by creating favorable mental norms and attitudes, we can increase the intention of individuals to perform a specific behavior. Therefore, the researchers suggest using this model in educational programs related to population growth policies and in designing interventions to encourage couples to have children in conditions such as the COVID-19 pandemic.

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Conflicts of interest

Nothing to declare.

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