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The effect of an educational intervention based on the theory of planned behavior on childbearing intentions in women: A quasi-experimental study

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Abstract:

BACKGROUND: Childbearing is an important biological and social event in the life of most women. It is a voluntary behavior that can be affected by many factors. Behavioral theories are a potential pathway to study and influence childbearing behavior. The present study was conducted to determine the effect of an educational intervention based on the theory of planned behavior (TPB) on childbearing intentions in women presenting to premarital counseling centers in Tehran.

MATERIALS AND METHODS: This randomized controlled quasi-experimental study was conducted on 150 women aged 20–35 years presenting to premarital counseling centers. The participating women were randomly divided into an intervention ($n = 75$) and a control ($n = 75$) group using randomized sampling in Excel. The intervention group received two 90-min sessions of training. The effect of training was assessed 6 weeks after the intervention using the researcher-made questionnaire based on the components of the TPB. The questionnaires included subjects' demographic details, knowledge (11 items), attitude (13 items), subjective norms (10 items), perceived behavioral control (8 items), and behavioral intention (4 items). Data were analyzed by SPSS software (version 22) and independent *t*-test, Chi-square, Mann–Whitney U-test, and Wilcoxon test. $P < 0.05$ was considered statistically significant.

RESULTS: There were significant differences between the intervention and control group after the intervention in the Mean \pm SD scores of knowledge (6.73 ± 2.63 vs. 4.73 ± 2.85 , $P = 0.001$), attitude (48.23 ± 7.19 vs. 40.13 ± 5.80 , $P = 0.001$), perceived behavioral control (33.19 ± 5.28 vs. 23.59 ± 3.47 , $P = 0.001$), and behavioral intention (13.84 ± 2.95 vs. 11.77 ± 2.12 , $P = 0.027$).

CONCLUSION: The findings showed that an education based on the TPB increased women's childbearing intentions by affecting their knowledge, attitude, perceived behavioral control, and intention. It is therefore essential to implement better public policies, create a more conducive educational setting for women of different age groups, and build a social support system.

Keywords:

Education, intention, reproductive behavior, theory of planned behavior

Introduction

A dramatic decline in fertility rate throughout the world, especially in developing countries, is an important

demographic change experienced in the past three decades.^[1] In this pathway, the extreme decline has been witnessed in fertility rates in Iran, from 6.9 children per woman in 1984 to 2.01 in 2016.^[2,3] The

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low fertility rate is a major concern for policy-makers in many developed countries as it affects population size and composition.^[4] The continuation of the current fertility trend in Iran means a significant increase in the 50–64-year-old population by 2051, by which year Iran will have an aging population.^[5] The aging population is an inevitable consequence of the decline in population growth,^[6] which will lead to numerous problems in production and economic growth. Employing foreign workers as a solution means entering of non-matching subcultures and increased moral and social anomalies.^[7] The shortage of workforce increases women's share of the job market, which main effect of this trend will be increased the age of childbearing.^[4-8]

In the past decade, women's age at first childbirth increased sharply. Delay in childbearing increased the risk of inadvertent infertility and limited the number of children per family.^[9,10] Increasing parent's age adversely affects fertility and is associated with a greater risk of miscarriage, ectopic pregnancy, infertility, multiple pregnancy, low birth weight, the Down Syndrome, gestational hypertension, gestational diabetes, congenital heart disease, cleft palate, esophageal atresia, schizophrenia, stillbirth, and maternal death.^[9,11,12]

Childbearing is an important biological and social event in the life of most women. They are regarded as the main targets of population and reproduction control policies and are themselves somewhat inclined toward low childbearing and regard having few children the result of a rational decision on their end.^[9-13] Women's childbearing has been affected by their academic achievements, lack of information about childbearing, personal independence and power, the achievement of worthy goals, income, age at marriage, the development of urbanization, and the desire for social mobility.^[2,10,14-16]

As reproduction is a voluntary behavior, it can be studied and influenced through behavioral theories. One such theory that is of interest to demographers is the theory of planned behavior (TPB). In the TPB, the intention is the main determinant of behavior. The individual's intention to perform a behavior is composed of three constructs, including attitude toward the behavior, subjective norms, and perceived behavioral control. The attitude toward a behavior refers to the individual's positive or negative assessment of that behavior. The individual's attitude is directly affected by her beliefs. Subjective norms refer to the social pressures on the individual to perform a behavior. Perceived behavioral control shows the possibility of the individual not performing a behavior if she considers it difficult and believes that she does not have the necessary ability to performing it.^[17] According to Klobas and Morgan and Bachrach, TPB is a useful model to study fertility that it can be applied to

decisions regarding fertility about which the individual in the target population is likely to have reasoned.^[18,19] The constructs of the TPB have been examined to various demographic topics, such as leaving home^[20] and fertility.^[21,22] Caplescu used the TPB to study fertility intentions in Romania. A sample of 1851 women aged 18–44 years was studied. The results indicate that age and the number of children already born to a respondent together with her attitude and the woman's perception of her significant others' attitude toward having a birth in the near future are important in determining the odds that a woman will intend to decide for childbearing.^[23] In other studies, Dommermuth *et al.* studied time frame of intentions to have a child in the next 3 years based on the TPB. Data from Norway ($n = 1307$) were used. The results showed that subjective norms, positive attitudes, and perceived behavioral control had a significant effect on the intention to have a child now rather than within the next 3 years. However, this effect disappears when controlled for demographic background variables, suggesting that the effect of perceived control on the timing of having a child varies considerably with personal circumstances.^[24] Billari *et al.* also reported in a sample from Bulgaria, the three components are broadly predictive of fertility intentions. More specifically, attitudes are more relevant than norms for higher parities. Socioeconomic, ideational, psychological, and social capital-based factors are relevant background determinants.^[25]

In Iran, many other studies have focused on the factors affecting childbearing, but few interventional studies have been conducted on this phenomenon and behavior change models.^[14,26,27] As many studies suggest that TPB is a useful model for studying fertility decision-making, in line with the country's latest policies on childbearing and the lack of studies on the effect of education on childbearing intention and decision, the present study was conducted to determine the effect of an educational intervention based on the TPB on childbearing intentions in women in Tehran. To the best of our knowledge, it is one of the first studies using TPB as an interventional guide to educate couples about fertility decision-making.

Materials and Methods

Setting and participants

The present randomized controlled quasi-experimental study was conducted in 2016 to determine the effect of education based on the TPB on childbearing intentions in 150 women presenting to premarital counseling centers in Tehran. The sample size calculated using

the following formula: $n = \frac{\left(Z_{\alpha} + Z_{\beta} \right)^2 \sigma^2}{\epsilon^2}$, in which

the type 1 error controlled for 5%, the power of study supposed to be 80%, and the effect size (the ratio of the standard deviation to the difference between two means) assumed to be 0.35 according to similar studies.

The participating women were randomly divided into an intervention ($n = 75$) and a control ($n = 75$) group using randomized sampling in Excel. Iranian women aged 20–35 years who presented to premarital counseling centers and were getting married for the first time and had at least a high school education were included in the study. The exclusion criteria consisted of absence in both training sessions and unwillingness to take part. Sampling was conducted through randomized cluster sampling and the premarital counseling centers in Tehran were taken as clusters. All the centers were then listed, and two of them were selected through simple random sampling [Figure 1].

Measurements

The questionnaires were completed by all the participants at the baseline (before implementing the intervention) and 6 weeks after the end of the educational sessions.

The questionnaire was designed by researchers based on the planned behavior model in this study in two parts.

The first part contained 11 items on the subjects' demographic details and the second part was designed based on the TPB and included ten items on knowledge (score range: 0–11), 13 on attitude (score range: 13–65), ten on subjective norms (score range: 10–50), eight on perceived behavioral control (score range: 8–40), and four on behavioral intention (score range: 4–20). The "knowledge" items were answered as "correct," "incorrect," and "I do not know," and correct answers were given one point and incorrect ones zero. The items on attitude, subjective norms, and perceived behavioral control were scored based on a 5-point Likert scale from "totally agree" (five points) to "totally disagree" (one point).

To assess the content validity, the questionnaire was distributed among ten experts (seven reproductive health experts, two health education experts, and one demographer) and their corrective comments were implemented. To assess the reliability of the tool, the questionnaire was completed by 30 participants using the test–retest method for stability assessment ($r = 0.75$) and Cronbach's alpha for internal consistency assessment ($\alpha = 0.75$).

Intervention

The educational package was designed according to the TPB and included topics such as decline in population growth, the contributing factors of decline in childbearing, the harms of bearing a single child, the effects of decline in population growth on the family and the society, the complications of pregnancy in older ages, and childbearing benefits and costs. The educational package was provided to the intervention group over two 90-min sessions within a 1-day interval. The training was provided by the researcher in the form of lectures, group discussions, and Q and A. At the end of each session, the topics covered in that session were reviewed and summarized, and the women were asked to convey this information to their spouses and relatives. At the end of the second session, a pamphlet containing the covered topics was distributed among the women. The control group received only the routine education provided by premarital counseling centers. Figure 1 shows the study flowchart.

Statistical analysis

The data obtained before and after the intervention were analyzed and compared between the two groups in SPSS version 22.0 (SPSS Inc., Chicago, IL) using the independent *t*-test, the Chi-square test, Mann–Whitney U-test, and the Wilcoxon test at the significance level of 5%. In the first step, the normal distribution of variables was tested using Kolmogorov–Smirnov test. As the data did not meet the normality assumption, the Chi-square test, Mann–Whitney U-test, and the Wilcoxon test were used for the data analysis.

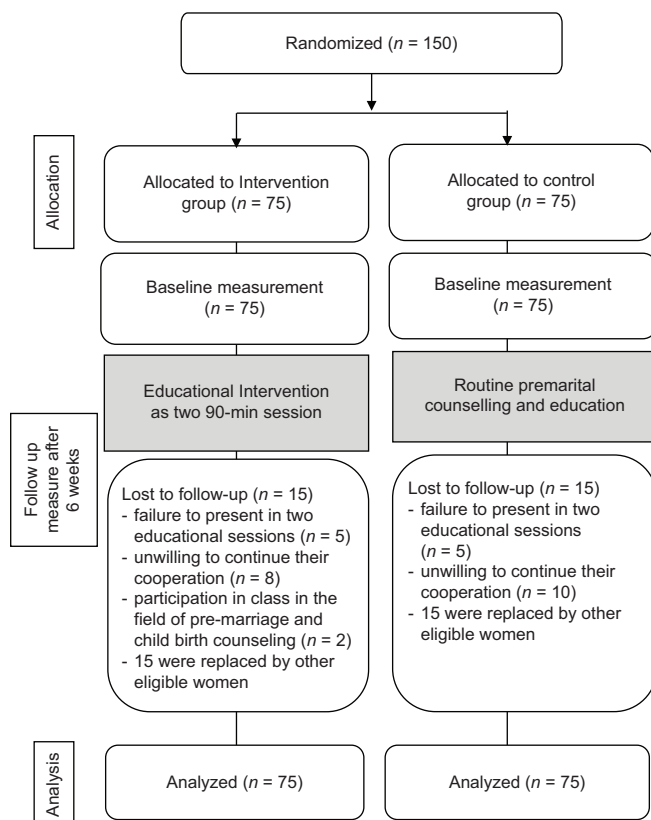


Figure 1: Study flowchart

Ethical considerations

The necessary permissions were obtained from the Ethics Committee of Shahid Beheshti University of Medical Sciences (ID: IR. SBMU. PHNM.1394.231), and the study was registered at the Iranian Registry of Clinical Trials (ID: IRCT2016030526911N1). A letter of introduction was then obtained and presented to the directors of these centers, and after obtaining their permission, sampling began by making daily visits to these centers. The researcher attended the study settings, identified the eligible women, introduced herself and ensured them of the confidentiality of the data, explained the importance and methods of the study, and finally obtained their written consent.

Results

A total of 150 women were examined in this study. The mean age of the participants was 23.9 years in the intervention group and 24.6 years in the control group, and the independent *t*-test showed no significant differences between the two groups ($P < 0.732$). The *t*-test also showed no significant differences between the mean age of the spouses in the intervention (28.6 years) and the control (30.3 years) groups ($P < 0.143$). Table 1 presents the other demographic details of the participants. The statistical tests showed no significant differences between the two groups in terms of the demographic variables.

Table 2 presents the mean and standard deviation of the scores obtained in knowledge, attitude, perceived behavioral control, and intention before and after the intervention in the intervention and control groups. The Mann–Whitney U-test showed no significant differences between the two groups in terms of the main dimensions examined in the study, including knowledge, attitude, perceived behavioral control and behavioral intention, before the intervention ($P > 0.05$). After the intervention, however, significant differences were observed between the two groups in the mean scores of these variables, except in terms of subjective norms.

Discussion

The present study investigated the effect of an educational intervention based on the TPB on childbearing intentions in women in Tehran. At the beginning of the study, the subjects in both the intervention and control groups had poor childbearing knowledge due to the inadequate education provided in premarital counseling centers.

Since the intervention group showed a significant post intervention increase in knowledge compared to the control group, it can be concluded that the planned regular training provided has been largely effective in improving

Table 1: The frequency distribution of the demographic variables in the participants

Group Variable	Intervention (n=75), n (%)	Control (n=75), n (%)	P
Education			
Below high school diploma	5 (6.7)	5 (6.7)	0.998*
High school diploma	17 (22.7)	17 (22.7)	
Associate's degree	15 (20.0)	15 (20.0)	
Bachelor's degree and higher	38 (50.7)	38 (50.7)	
Spouse's education			
Below high school diploma	2 (2.7)	2 (2.7)	0.778*
High school diploma	17 (22.7)	17 (22.7)	
Associate's degree	19 (25.3)	19 (25.3)	
Bachelor's degree and higher	37 (49.3)	37 (49.3)	
Occupation			
Housewife	47 (62.7)	47 (62.7)	0.853**
Manual laborer	2 (2.7)	2 (2.7)	
Corporate worker	26 (34.7)	26 (34.7)	
Spouse's occupation			
Unemployed	2 (2.7)	2 (2.7)	0.674**
Manual laborer	6 (8.0)	6 (8.0)	
Corporate worker	33 (44.0)	33 (44.0)	
Self-employed	28 (37.3)	28 (37.3)	
Other	6 (8.0)	6 (8.0)	
Housing status			
Private	21 (28.0)	22 (29.3)	0.789**
Rental	41 (54.7)	40 (53.3)	
Other	13 (17.3)	13 (17.3)	
Place of birth			
Urban	75 (100.0)	75 (100.0)	0.887**
Rural	0 (0.0)	0 (0.0)	
Job security			
Yes	37 (49.3)	37 (49.3)	0.565**
No	38 (50.7)	38 (50.7)	
Economic status			
Poor	8 (10.7)	0 (0.0)	0.202*
Moderate	45 (60.0)	50 (66.7)	
Good	20 (26.7)	25 (33.3)	
Very good	2 (2.7)	0 (0.0)	
Place of residence			
Tehran	71 (94.7)	69 (92.0)	0.514**
Outside Tehran	4 (5.3)	6 (8.0)	
Class attendance			
Yes	0 (0.0)	0 (0.0)	0.173**
No	75 (100.0)	75 (100.0)	

*Mann-Whitney U-test, **Chi-square test

women's knowledge. This result agrees with the findings obtained in a study conducted by Wang *et al.* (2012) on the effect of education on childbearing knowledge, attitude, and behavior in Southeast Asian immigrant women in Taiwan^[15] and another study by Hosseini *et al.* on the effect of reproductive health education on knowledge and attitude in girls about to get married.^[28]

The results of a study by Mahamed *et al.* (2012) aimed to investigate the effect of pregnancy health education on girls "knowledge and attitude toward marriage in

Table 2: The median and interquartile range scores of the planned behavior theory constructs in the intervention and control groups before and after the intervention

Stage Group/score range	Before the intervention, median (IQR)		P*	After the intervention, median (IQR)		P*	P* (compare the change between two groups)
	Control	Intervention		Control	Intervention		
Knowledge (0-11)	4.0 (5.0)	4.0 (5.0)	0.064	7.0 (4.0)	10.0 (5.0)	0.001	0.001
Attitude (13-65)	43.0 (6.0)	45.0 (8.0)	0.064	40.0 (10.0)	49.0 (11.0)	0.001	0.002
Subjective norm (10-50)	39.0 (5.0)	29.0 (4.0)	0.803	28.0 (9.0)	28.0 (4.0)	0.746	0.432
Perceived behavioral control (8-40)	26.0 (6.0)	26.0 (5.0)	0.834	24.0 (4.0)	35.0 (8.0)	0.001	0.001
Intention (4-20)	12.0 (3.0)	13.0 (2.0)	0.32	12.0 (4.0)	13.0 (2.0)	0.027	0.002

*Mann-Whitney U-test. IQR=Interquartile range

Boyer Ahmad city showed that educational intervention significantly increases the mean scores of girls' knowledge and attitude.^[29] Other studies have also shown the effectiveness of educational interventions based on the TPB on participants' knowledge promotion.

The first factor that affects people's intention to perform or not perform a behavior is attitude. A positive attitude toward a particular behavior is created by positive feelings about that behavior. People are more inclined toward a behavior when they have positive feelings about it or rate it positively.^[30] In the present study, the mean postintervention score of attitude was higher in the intervention group compared to the controls. Many studies have shown that education based on the TPB can create a positive attitude toward a particular behavior.^[31,32]

According to the findings, education has no effect on subjective norms. The results of a study by Caplescu entitled "Using the TPB to study fertility intentions in Romania" conducted on 1851 women aged 18–44 years showed that the attitude of the friends and relatives of women about their childbearing in the near future (subjective norm) affects the likelihood of their childbearing.^[23] In other studies that had used the TPB to change behaviors, the educational intervention had no effects on subjective norms.^[33]

In the TPB, perceived behavioral control is regarded as the third intention-controlling factor. Perceived behavioral control is the individual's understanding of her internal and external limitations, the ease or difficulty of performing a behavior, and her understanding of the skills, resources, and opportunities needed to perform that behavior.^[34] According to the results presented in Table 2, the mean postintervention score of perceived behavioral control was higher in the intervention group compared to in the controls, which shows the positive effects of the educational program on the level of perceived behavioral control. The present findings confirm the results obtained by other researchers on the effect of using the TPB for increasing the mean score of perceived behavioral control. The results of a study conducted by Erfani in 2014 on 2267 married women

below the age group of 36 years and residing in Tehran to investigate the factors affecting reproductive intentions showed that people with a greater understanding of the barriers and hardships of childbearing are more inclined toward not having children and vice versa.^[35] Moreover, in a study conducted by Pooreh and Hosseini Nodeh, the mean score of perceived behavioral control increased significantly in the intervention group, but these changes were not significant in the control group.^[32]

The present findings also showed that the majority of the women in the intervention group changed their behavioral intentions in relation to childbearing, which suggests the positive effects of the educational program in the intervention group compared to the controls. Most studies on these subjects have shown that an educational intervention based on the TPB affects health behavior intentions, including breastfeeding intentions^[31] and reproductive intentions.^[36]

The limitation of this study included the implementation of sampling only in governmental centers. Therefore, the results cannot be generalized for the general population.

Conclusion

The present study thus showed that the education provided based on the TPB had the greatest effect on knowledge, attitude, perceived behavioral control, and intention, and the least effect on subjective norms. Given the decisive role of women in socioeconomic development and their subsequent ability to control reproductive and fertility behaviors, efforts should be made to improve Iranian women's knowledge and change their attitudes toward childbearing so as to increase their childbearing intentions. In other words, women's low childbearing behavior can be deflected by offering them effective education during puberty, at marriage, and before pregnancy. It is therefore essential to implement better public policies, create a conducive educational setting for women of different age groups, and build a social support system.

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Conflicts of interest

There are no conflicts of interest.

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