

Original Paper

Effectiveness of the Education Based on the Theory of Planned Behavior on Childbearing Intention in Single-child Women



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ABSTRACT

Introduction: Rapid decline of the total fertility rate in Iran in recent decades has caused serious demographic challenges to the country. One important reason for this decrease is single-child behavior adopted by Iranian families.

Objective: The present study was conducted to assess the effectiveness of education based on the Theory of Planned Behavior (TPB) on childbearing intention in single-child women.

Materials and Methods: This randomized field trial with the pretest-posttest design was done on 72 single-child women presenting to health centers in Mashhad City, Iran, in the intervention (37 persons) and control (35 persons) groups from August 2019 to February 2020. Research tools included a demographic and obstetric questionnaire and a researcher-made childbearing intention questionnaire based on TPB. The intervention group received three 110-min sessions of education, which was based on TPB. The control group received routine health center care. The study data were analyzed by using the Kolmogorov-Smirnov, Shapiro-Wilk, Independent t-test, Mann-Whitney U test, repeated measures Analysis of Variance (ANOVA), Friedman test, post hoc tests of Bonferroni and Dunn, the Spearman rank correlation coefficient, and the Generalized Estimating Equation (GEE) model.

Results: The Mean±SD age of the participants were 32.6±4.7 and 32.9±4.7 years in the intervention and control groups, respectively, and most of the women had university-level education in both groups. Changes in childbearing intention from the pre-intervention stage were significantly higher in the intervention group than the control group immediately (P=0.001) and then one month after the intervention (P=0.001). The results of the GEE model showed that the childbearing intention was significantly higher in the intervention group (β=0.68, 95% CI; 0.449-0.911, P=0.001), and there was a significant positive relationship between attitude and childbearing (β=0.023, 95% CI; 0.013-0.033, P=0.001).

Conclusion: Education based on the theory of planned behavior increased childbearing intention in single-child women in this study, so this educational program is advised for promoting childbearing.

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Highlights

- Iran's total fertility rate has decreased to below replacement levels in recent decades, causing great concern about population challenges in the near future among scholars and politicians.
- Single-child behavior among many Iranian families has been recognized as one of the crucial reasons for this decreased fertility rate.
- Education based on the theory of planned behavior is useful in developing intention and finally changing health-related behaviors.

Plain Language Summary

Iran's Total Fertility Rate (TFR) has decreased to below replacement levels in recent decades. The rapid decrease in TFR has exposed the country to imminent population challenges in the near future, so that without intervention, Iran will face population aging and decreased development indices within three to four decades. According to the literature, one of the main reasons for the decrease in TFR has been adopting single-child behavior by many Iranian families. Educational programs based on behavioral theories, including the theory of planned behavior, are effective in developing intention and finally changing health-related behaviors. The present study aimed to assess the effectiveness of education based on the theory of planned behavior on childbearing intention in single child women. This study showed that education based on the theory of planned behavior increased childbearing intention in single-child women. Widespread adoption of the current educational program is advised for promoting childbearing in single-child women.

Introduction

Iran's Total Fertility Rate (TFR) declined dramatically in the past three decades [1, 2]. This trend started in the late 1980s [2] and decreased to the below-replacement level of 1.9 in 2006 [3].

The policy of encouraging more children in Iran resulted in a significant rise in TFR to 5.5 in 1988, causing a "population burst" [4]. This increase led to significant concerns about improper population growth and its consequent health problems among authorities. So the previous population policy was dropped, and low fertility was encouraged. Following this policy shift and extensive propaganda in the mass media, Iran's TFR started to decrease, as mentioned earlier [3].

Recent research studies showed that despite the decrease in TFR to below-replacement levels, the ideal number of children is still two among Iranian families [5, 6]. However, single-child intention and behavior is increasing, especially in urban areas [1]. This tendency has many adverse effects for the families like less problem-solving skills, less durability, excessive sense of independence or dependence, selfishness, jealousy,

seclusion, fear of losing the only child, lack of playmates, lack of family support in adulthood, impaired sense of competition, excessive relation with friends to fill the family gap and the risk of indulging in dangerous behaviors like drug addiction, and improper expectations for single-child [7-9].

The rapid decrease in TFR has exposed the country to imminent population challenges in the near future, so that without intervention, Iran will face population aging and decreased development indices within three to four decades [10-12]. Much research has been done to study the causes of decreased TFR in Iran [13-18]. Social researchers have studied the reasons for single child behavior [1, 5, 19-23]. For example, in a study in Mashhad, the reasons for single child behavior were categorized in child-oriented (concerns about child education and related factors), and parent-oriented (parents tendency for job or study progress, concerns about the expenses of the second childbearing and associated factors) categories [24]. In another study in Tehran based on the theory of reasoned action and theory of planned behavior, different factors, including challenging experience with the first child, being too old for the second childbearing, insufficient time for the second child, motivation for job or study progress, and different personalities were recognized as underlying factors for single-child behavior [5].

Despite the extensive research done on single-child behavior, we have not found an interventional study assessing the effectiveness of the educational intervention on childbearing intention in single-child women. However, many studies have emphasized the role of education and changing the attitudes of women about childbearing as possible solutions [23, 25, 26]. At present, childbearing consultation is done in health centers all over Iran in the form of pamphlets and face to face consultation. Still, there is no specially designed educational program, and the efficacy of the present consultations has not been evaluated.

Psychologists believe that educational programs aiming at behavioral change are only useful if they are based on health behavior theories [27]. One of the theories that have been extensively studied and shown to be effective in behavioral change is the Theory of Planned Behavior (TPB) [28-30]. This theory was introduced by Ajzen and Fishbein in the mid-1980s and tried to study human behavior in different situations using its three constructs of attitude, subjective norms, and perceived behavioral control. According to this theory, these three constructs together give rise to behavioral "intention", which in turn will lead to actual behavior [31, 32].

Given the importance of encouraging childbearing, especially in single-child women, and taking into account the ability of TPB to explain major factors for single child behavior, the present study was designed to assess the effectiveness of education based on the theory of planned behavior on childbearing intention in single-child women.

Materials and Methods

The present study was a randomized field trial in which 72 eligible single-child women coming to Mashhad health centers from August 2019 to February 2020 were enrolled in the study.

The sample size was calculated using the effect size equation. For determining the effect size, Pakpour et al. study was used with an α error of 0.05 and 80% power [30]. For the present study, the effect size (d) was calculated using the G-Power statistical software as 1, which was readjusted to 0.7 to increase the sample size. The final sample size in each group was calculated as 33, which was increased to 37, assuming a 10% sample size drop.

The study environment included 6 community health centers randomly selected in Mashhad and the district of Torghabeh-Shandiz. At the first step, health centers

number 3 and 5 were randomly drawn from the 5 main health centers of Mashhad. Then 2 community health centers from health center No. 3 and 3 centers from health center No. 5 were selected with regard to the number of daily visits and proper environment for education. One community health center was also selected from Torghabeh-Shandiz main health center. The names of the 6 selected centers were written on 6 papers and put in a bag, and then randomly drawn to put in the intervention and control groups alternately.

The inclusion criteria were willingness to participate, being Iranian and literate, being married, having only one child aged at least 2 years and 11 months and 29 days, having no intention for the second childbearing, being 18 to 40 years old, lacking physical or psychological diseases impeding educability, the present marriage being the first marriage, lacking pregnancy contraindications as reported by woman and health center files [33], not having known fertility problems in woman or husband, and lacking major psychiatric disease as reported by woman. The exclusion criteria were the incidence of major stressful events (including the death of the husband or a close relative, severe family conflicts.) during the research period, refusing from continuing cooperation during the research period, and more than one session absence from the educational program. In the beginning, 80 women were enrolled in the study. Eight women were excluded according to exclusion criteria, and finally, data from 72 women (37 in the intervention and 35 in the control group) were examined (Figure 1).

Data collection tools included a demographic and obstetric questionnaire and researcher-designed TPB based questionnaire [1, 34] with 57 questions in 4 sections: attitude: 34, subjective norms: 10, perceived behavioral control: 10, and behavioral intention: 3 questions. A 5-point Likert-type scale (from strongly disagree to agree strongly) was used for answering the TPB questionnaire, with a score of 0 to 4 for each question. Two of the attitude questions received reverse scores.

The validity of the questionnaire was assessed with the content and face validity by 7 expert lecturers from Mashhad University of Medical Sciences. Reliability was assessed using the Cronbach alpha method and calculated as 0.85 for the whole questionnaire, 0.85 for attitude, 0.75 for subjective norms, 0.77 for perceived behavioral control, and 0.88 for behavioral intention.

After obtaining the relevant permissions, the researcher went to the selected community health centers and, after explaining the study objectives and getting writ-

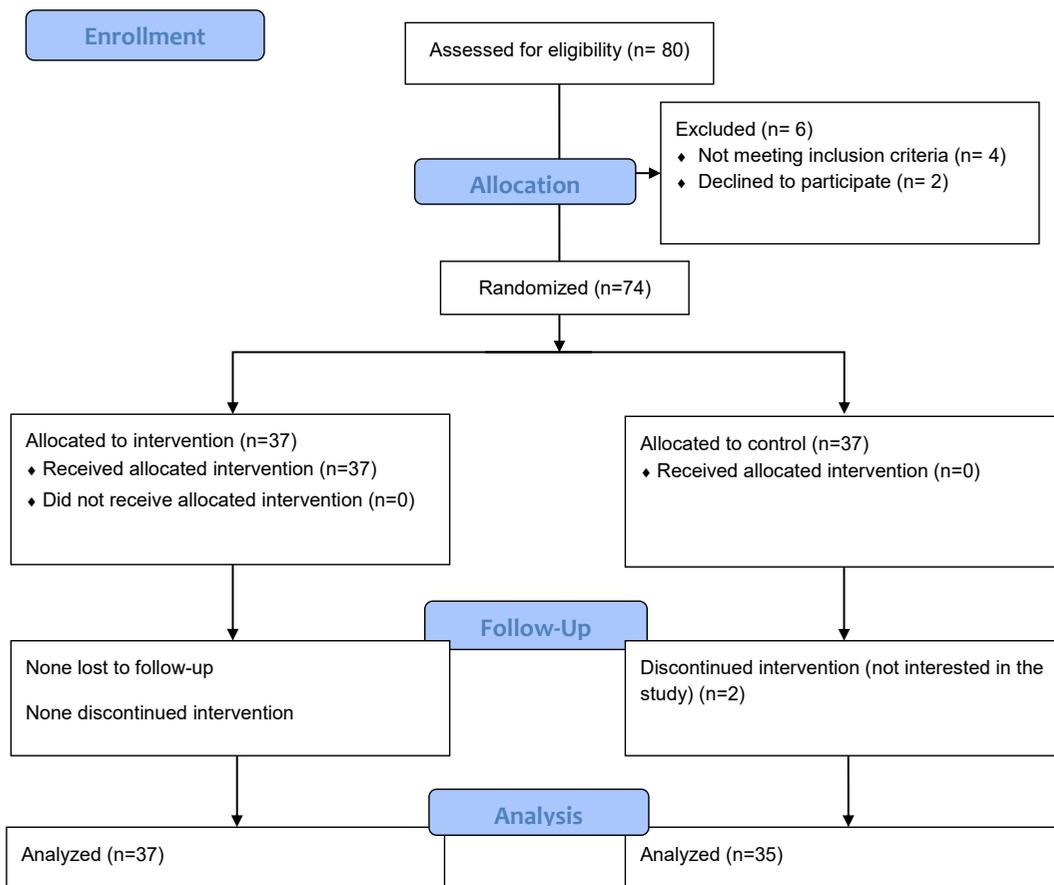


Figure 1. Participants flow diagram

ten informed consent, handed the questionnaires to the participants. Then the educational program that was designed based on the TPB constructs was implemented for the intervention group, using methods of lecture giving, group discussion, question and answer, role-playing, slide show, and pamphlet distribution, during three sessions of 110 minutes duration. Education time and sessions had a wide variation among different studies [28-30, 35].

The educational material for this study was prepared under the supervision of expert university lecturers based on the theory of planned behavior. The researcher obtained the knowledge and skills necessary to implement the educational program under experts' supervision. During the sampling period, whenever the number of participants from the centers allocated to the intervention group reached the threshold of 18, weekly classes were held. So the intervention group received education in two subgroups, each receiving three weekly classes, as outlined in Table 1.

The control group received routine health centers care. The two groups were asked to fill TPB question-

naire again, once immediately after the intervention and then one month after the educational program. In previous studies, different times (from 1 month to three months) have been used to assess the change in TPB constructs [28-30, 35]. In this study, only the statistician was blinded to the allocation of the study groups.

The study data were tested for normal distribution using the Kolmogorov-Smirnov and Shapiro-Wilk tests. The two groups were compared using the Independent t-test and the Mann-Whitney test. For inter-group testing and comparison of the three stages (before the intervention, immediately after the intervention, and one month after the intervention), Analysis of Variance (ANOVA) with repeated measures, post hoc tests of Bonferroni and Dunn, and the Freidman test were used. To assess the correlation between TPB constructs and childbearing intention before education, the Spearman rank correlation coefficient-test was used. To evaluate the role of the intervention on the improvement of childbearing intention, a Generalized Estimating Equation (GEE) model was used. The obtained data were analyzed in SPSS v. 16 at the significance level of 0.05.

Table1. Educational program sessions

Sessions/Time	Objectives	Educational Methods and Subjects
Session one (110 minutes)	To improve single child women's attitude toward childbearing	Organized lecture, brainstorming, group discussion, and question and answer Introduction, explanation of study objectives about single-child and its consequences, discussion about the experience of pregnancy and delivery consequences in mother and newborn among relatives and friends
Session two (110 minutes)	To improve single-child women's subjective norms toward child-bearing	Organized lecture, group discussion and question and answer, role-play A review of the previous session, a short discussion on the extent of the importance of other's opinions in personal decisions, discussion of current community norms about childbearing and the number of children, introducing some famous and successful women who have more than one child, performing a scenario about imitating others
Session three (110 minutes)	To improve single child women's perceived behavioral control toward childbearing	Organized lecture, group discussion, and question and answer A review of previous sessions, lecture on the normal physiologic body changes in pregnancy, methods to cope with these changes, the difference between the first and subsequent pregnancies, the conclusion

Results

The Mean±SD age of the participants were 32.6±4.7 and 32.9±4.7 years in the intervention and control group, respectively. The Mean±SD age of their husbands were 36.8±4.3 and 36.6±5.5, and their child Mean±SD age were 7.8±7.5 and 7.2±3.0 years in the intervention and control group, respectively. About 77.8% of the intervention and 67.6% of the control group had university-level education. The two groups were homogeneous regarding demographic data and past obstetric history (Table 2).

The Spearman rank correlation coefficient-test showed that before the intervention, there was a statistically significant positive correlation between all three TPB constructs and childbearing intention between attitude (P=0.001, r=0.41), subjective norms (P=0.004, r=0.33), and perceived behavioral control (P=0.001, r=0.48) with childbearing intention.

The results showed that the two groups were homogeneous regarding TPB constructs before the intervention. Immediately after the educational intervention, there was no significant difference in the attitude score between groups (P=0.062). However, one month after education, the score rose significantly in the intervention compared to the control group (P=0.001). Regarding Subjective norms, there was a significant difference immediately and one month after education between the intervention and control group (P=0.009 and P=0.004, respectively). With regard to the perceived behavioral control score, the difference between the two groups was significant one month after the education (P=0.025). Regarding childbearing intention, there was a significant difference between the two groups before

the intervention (P=0.001). There was also a significant difference between intervention and control group after intervention (p=0.001). Regarding attitude, within-group testing with repeated measures ANOVA showed a significant difference between different stages in the intervention group (P=0.03). Still, there was no significant change between stages in the control group. Also, the post-hoc Bonferroni test showed that the difference was significant only between one month after the intervention and before the intervention (P=0.04). Regarding subjective norms, after a significant result in repeated measures ANOVA (P=0.019), the Bonferroni test showed a significant difference between "one month after" as compared to the "before education" stage in the intervention group (P=0.037). However, repeated measures ANOVA test showed no significant difference between stages in the control group. Regarding perceived behavioral control, according to repeated measures ANOVA test no significant change was seen between the stages in either intervention or control group (P=0.142 and P=0.587 respectively). For childbearing intention, the Freidman test showed a significant difference between different stages in the intervention group (P=0.001), but there was no significant difference in the control group. Furthermore, post hoc Dunn's test showed a significant difference between one month after the intervention and before intervention stages (P=0.001). Intra-group comparison showed that the mean score for attitude, subjective norms and intention toward childbearing did not change in the control group, while it improved significantly in the intervention group (Table 3).

To evaluate the relationship between the TPB constructs and childbearing intention after adjusting the effect of intervention and time, a Generalized Estimating Equation (GEE) model was used and showed that change of

Table 2. Comparison of demographic and obstetric data between the intervention and control groups

Variables		Group		Sig.
		No. (%)		
		Intervention (37)	Control (35)	
Education	Intermediate	2 (5.6)	2 (5.9)	0.644**
	High school	6 (16.7)	9 (26.5)	
	University	28 (77.8)	23 (67.6)	
Husband's education	Primary	2 (5.4)	0 (0.0)	0.680**
	Intermediate	4 (10.8)	3 (8.6)	
	High school	9 (24.3)	9 (25.7)	
	University	22 (59.5)	23 (65.7)	
Occupation	Working outside	21 (56.7)	22 (62.8)	0.385**
	Working at home	13 (35.1)	8 (22.8)	
	Student	3 (8.1)	3 (8.5)	
Husband's occupation	Laborer	6 (16.2)	4 (11.4)	0.626**
	Employee	15 (40.5)	12 (34.3)	
	Other	16 (43.2)	19 (54.3)	
Family income	Below sufficient	5 (13.5)	6 (17.1)	0.345**
	Sufficient	26 (70.3)	19 (54.3)	
	More than sufficient	6 (16.2)	10 (28.6)	
Thinking about divorce in the last year	No, never	32 (86.5)	28 (80)	0.701**
	Yes, rarely	3 (8.1)	5 (14.3)	
	Yes, often	2 (5.4)	2 (5.7)	
Number of pregnancies	One	25 (67.6)	24 (68.6)	0.929*
	Two	8 (21.6)	7 (20)	
	Three	3 (8.1)	4 (11.4)	
	Four	1 (2.7)	0(0)	
Number of abortions	One	8 (21.6)	6 (17.1)	0.628***
	Two	2 (5.4)	4 (11.4)	
Type of delivery	Cesarean	20 (54.1)	22 (62.9)	0.629**
	Vaginal	16 (43.2)	13 (37.1)	
	Both	1 (2.7)	0(0)	

Variables		Group		Sig.
		No. (%)		
		Intervention (37)	Control (35)	
Child gender	Boy	16 (44.4)	19 (54.3)	0.407**
	Girl	20 (55.6)	16 (45.7)	
Child gender preference	Boy	3 (8.1)	7 (20)	0.345**
	Girl	18 (48.6)	15 (42.9)	
	Indifferent	16 (43.2)	13 (37.1)	
Ideal number of children	One	13 (35.1)	17 (50.0)	0.091*
	Two	14 (37.8)	13 (38.2)	
	Three and more	10 (27)	4 (11.8)	
Previous conception	Wanted	29 (78.4)	27 (77.1)	0.347**
	Unwanted	2 (5.4)	5 (14.3)	
	Unplanned	6 (16.2)	3 (8.6)	
Current contraceptive	Pills	2 (5.4)	5 (14.3)	0.348**
	Condoms	16 (43.2)	15 (42.9)	
	Interrupted intercourse	16 (43.2)	9 (25.7)	
	Other	3 (8.1)	6 (17.1)	

*Mann-Whitney U test; **Chi-square; *** Fisher exact-test.

childbearing intention score from before the intervention was significantly higher in the intervention group as compared to the control group ($P=0.001$). According to the GEE model, there was a statistically significant positive correlation ($P<0.001$) between changes in attitude score and changes in intention score (Table 4).

Discussion

The results of the present study showed that the childbearing intention of single-child women rose significantly after the educational intervention based on the Theory of Planned Behavior (TPB). For the three TPB constructs, the results showed that the score for attitude and subjective norms rose significantly after implementing an educational program based on TPB for single-child women, but the result for perceived behavioral control score was not conclusive.

This finding was compatible with the results of the Caplescu study in Romania that showed women with neutral attitudes were 3.6 times less likely to express an intention to have a child. In contrast, women who held a negative attitude towards childbearing were 53.6 times

less likely to have such an outcome [36]. For perceived behavioral control, it was shown that using contraceptive methods had an effect on women's childbearing intention, but there were many intruding factors and the effect was not conclusive. Considering the major social and cultural differences between Romania and Iran, the results of this study cannot be readily generalized to the Iranian society and must be evaluated through domestic studies.

Regarding perceived behavioral control, it is worth mentioning that this construct is directly affected by the other two TPB constructs. Some behaviors are completely under "attitudinal" control, while others are under "normative" control. Still, others are under "perceived" control [27]. The domain of each type of control may be different in different societies. For example, certain behavior may be completely under "attitudinal" control in one community while being completely under "normative" control in another society [37]. For example, Fishbein and McLaren in a study on adults over the age of 40, showed that colonoscopy intention was completely under "normative" control, while exercise intention was under "attitudinal" and "perceived" controls [38].

Table 3. Inter-group and intra-group comparison of Theory of Planned Behavior constructs and intention

TPB Construct	Time	Groups		Inter-group Test Sig.
		Mean±SD		
		Intervention (37)	Control (35)	
Attitude	Score before the intervention	67.4±16.1	61.8±17.1	0.158*
	Score immediately after the intervention	68.5±17.3	61.0±16.3	0.062*
	Score one month after the intervention	73.4±11.2	61.8±17.2	0.001*
	Score change immediately after the intervention	1.2±11.8	-0.8±2.8	0.339*
	Score change one month after the intervention	6.0±15.2	0.0±3.5	0.246**
	Intra-group test result Sig.	0.033***	0.358***	-
Subjective norms	Score before the intervention	25±4.8	23.3±6.1	0.195*
	Score immediately after the intervention	26.4±4.5	23.2±5.7	0.009*
	Score one month after the intervention	27.1±4.7	23.1±6.3	0.004*
	Score change immediately after the intervention	1.4±4.2	-0.1±1.5	0.171**
	Score change one month after the intervention	2.1±4.8	-0.2±1.2	0.001**
	Intra-group test result Sig.	0.019***	0.698***	-
Perceived behavioral control	Score before the intervention	21.1±5.9	19.1±5.7	0.155*
	Score immediately after the intervention	21.1±6.3	19.3±5.7	0.21*
	Score one month after the intervention	22.4±5.4	19.4±5.6	0.025*
	Score change immediately after the intervention	0.1±4.7	0.2±1.6	0.474**
	Score change one month after the intervention	1.3±5.1	0.3±1.9	0.247**
	Intra-group test result Sig.	0.142***	0.587***	-
Intention	Score before the intervention	3.11±1.12	2.17±0.95	0.001**
	Score immediately after the intervention	3.78±1.08	2.14±1.00	0.001**
	Score one month after the intervention	4.11±0.97	2.31±1.13	0.001**
	Score change immediately after the intervention	0.68±0.78	-0.03±0.38	0.001**
	Score change one month after the intervention	1±0.78	0.14±0.55	0.001**
	Intra-group test result Sig.	0.001****	0.368****	-

*Independent t-test; **Mann-Whitney U test; ***ANOVA with repeated measures; **** Freidman test.

Another reason for the failure of the educational program in changing perceived behavioral control may be the fact that despite several invitations, the husbands did not participate in the educational program. The contents of the program were handed out to husbands in the form of a booklet, but this could not compensate for their refusal to participate. Taking into account that

childbearing is a complex behavior and has several aspects, many of which are not under personal control (family influences, social and cultural factors, large scale population policies, etc.), it appears that the role of these TPB constructs in childbearing intention needs to be evaluated by independent studies.

Table 4. The relationship between stage, group, and the theory of planned behavior constructs with childbearing intention

Variables	β	Coefficient Standard Error	95% CI		Hypothesis Test		
			Lower	Upper	Wald	Sig.*	
Stages	One month after the intervention	0.183	0.088	0.01	0.355	4.316	0.038
	Immediately after the intervention			Reference			
Groups	Intervention	0.68	0.118	0.449	0.911	33.332	0.001
	Control			Reference			
Attitude	0.023	0.005	0.013	0.033	19.131	0.001	
Subjective norms	0.005	0.018	-0.029	0.04	0.094	0.759	
Perceived behavioral control	0.001	0.023	-0.044	0.046	0.002	0.966	

Response variable: Changes in the intention score from the pre-intervention stage.

* Generalized Estimating Equation (GEE) model.

The results of the present study proved the predictive power of all three constructs of TPB for the second fertility intention in single-child women. Other studies have had conflicting results in this regard. For example, the study by Dommermuth et al. showed that fertility intention for childless women (first childbearing intention) was more strongly affected by subjective norms, while for subsequent fertilities, the roles of attitude and perceived behavioral control were more critical [39]. In Caplescu’s study, attitude and subjective norms were more significant predictors of childbearing intention, respectively [36]. Other studies have recognized several factors in the framework of TPB constructs as underlying factors for single-child intention and behavior among women [5, 19, 21]. In a study by Mobasheri et al. participants listed several factors for their decision to have only one child, including increased expenses and economic pressures, lack of government incentives and support, the attitude that “having more children is an indicator of lower social class”, husband’s objection, feeling incapable of caring for the second child, childbearing impeding job or study progress, fear of delivery, pessimistic view of relatives, and fear of miscarriage or stillbirth [21]. In another study by Behmanesh, an in-depth interview with 13 single-child women in Babol City in the north of Iran, factors like social imitation, self-priority, insecure future, and marriage conflicts were recognized as the most important factors for single-child behavior [19].

According to the present literature review, interventional studies assessing the effectiveness of the educational intervention on childbearing intention in single-child women who lacked intention for the second childbearing are limited. TPB is regarded as a comprehensive frame-

work for educational programs aiming at health behavior changes. The results of the present study showed that educational programs based on TPB could effectively increase fertility intentions in single-child women. One of the limitations of the present study is that intention may or may not be followed by behavior because of several intruding factors [39]. Besides, personal, psychological, and cultural differences of the study units affect their responses, and this was partly controlled by the randomized allocation of study units to the intervention and control groups. Also, it must be mentioned that because of the implementation of the educational program by the researcher, blinding was not possible.

The results of the present study showed that educational program based on TPB is effective in increasing childbearing intention in single-child women. Taking into account the worrying situation of population growth in Iran and the prevalence of single-child behavior among Iranian women, it seems that educational programs for childbearing designed upon the theory of planned behavior like the educational program of the present study can effectively increase childbearing intention among single-child women and thus help the country’s significant population policies.

Ethical Considerations

Compliance with ethical guidelines

The study subjects signed written informed consent. They also received verbal and written information about the study objectives, design, and duration. They were also reassured about their right to withdraw from the study. The confidentiality and anonymity of the sub-

jects' information were emphasized as well. The study protocol was approved by the Iranian National Committee for Ethics in Biomedical Research (Project Code: IR.MUMS.NURSE.REC.2019.033).

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Authors' contributions

Conceptualization: Yasaman Akbarian Moghaddam, Maryam Moradi, and Mohammad Vahedian Shahroodi; Data collection: Yasaman Akbarian Moghaddam, Mohammad Vahedian Shahroodi; Data analysis: Yasaman Akbarian Moghaddam, Vahid Ghavami; Writing – original draft: Yasaman Akbarian Moghaddam, Maryam Moradi; Writing – review & editing: All authors.

Conflict of interest

The authors declared no conflict of interest.

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References

- [1] Khalajabadi Farahani F, Saraie H. [Intention for single child among women and men on the threshold of marriage in Tehran: Levels and determinants (Persian)]. *Population Studies*. 2013; 1(1):61-85. http://jips.psri.ac.ir/article_89149.html
- [2] Statistical Center of Iran. [Based on the results of the 2016 census, the overall fertility rate in Iran during the time period 2012-2016 is 2.01 (Persian)] [Internet]. 2017 [Updated 2017 December 4]. Available from: <https://www.amar.org.ir/news/ID/5080/>
- [3] Abbasi-Shavazi MJ. [Fertility developments in Iran in the last four decades, application and evaluation of their children's method in estimating fertility using census data 1986 to 2011 (Persian)]. [MA. thesis]. Tehran: Economic Statistics Research Group. <https://www.srtc.ac.ir/Archives-of-research-projects/ID/1345/>
- [4] Jahanfar M. [Foundation of demographics (Persian)]. Tehran: Dehkhoda; 1997. <http://opac.nlai.ir/opac-prod/bibliographic/504751>
- [5] Kgalajabadi Farahani F, Saraei H. [Exploration of underlying factors for single child intention and behavior in Tehran; a qualitative study (Persian)]. *Women's Strategic Studies*. 2016; 18(71):29-58. [DOI:10.22095/JWSS.2016.33826]
- [6] Razeghi-Nasrabad HB, Mirzaei M. [Gap between current children and ideal number of children in selected provinces of Semnan, Kohgiluyeh and Boyer-Ahmad and Hormozgan (Persian)]. *Journal of Population Association of Iran*. 2012; (13):149-76. <https://www.magiran.com/p1468088>
- [7] Razeghi-Nasrabad HB, Hosseini Z, Sheykhi MT. [Women's lived experience of one-child with emphasis on the reasons and consequences in the city of Shahrar (Persian)]. *Journal of Population Association of Iran*. 2018; 11(21):43-82. http://www.jpaiassoc.ir/article_31941.html
- [8] Satooriyan SA, Tahmasiyan K, Ahmadi MR. [A comparative study of the behavioral problems of children from single-child families and two-child families (Persian)]. *Ravanshenasi va Din*. 2014; 7(3):65-80. <http://ravanshenasi.nashriyat.ir/node/276>
- [9] Shojaei J, Yazdkhasti B. [One-child living experience: A study of girls over 18 years (Persian)]. *Women in Development & Politics*. 2018; 15(4):447-76. [DOI:10.22059/JWDP.2017.238489.1007242]
- [10] Fooladi M. [A reanalysis and criticism of demographic theories and policies, with emphasis on recent demographic policy of Iran (Persian)]. *Ma'rifat-i Farhang-i Ejtemaii*. 2013; 4(2):145-72. <http://marefatefarhangi.nashriyat.ir/node/143>
- [11] Mahmoudi MJ. [Demographic developments, challenges ahead and the need to revise Iran's population policies (Persian)]. *Bardashte Dovvom*. 2010; 7(11-12):41-73. <http://ensani.ir/fa/article/272069>
- [12] Samiei Nasab M, Torabi M. [Demographic indices and policies in Iran (Persian)]. *Bardashte Dovvom*. 2010; 7(11-12):143-88. <http://ensani.ir/fa/article/272072>
- [13] Baki-Hashemi S, Kariman N, Ghanbari Sh, Pourhoseingholi MA, Moradi M. Factors affecting the decline in childbearing in Iran: A systematic review. *Advances in Nursing & Midwifery*. 2018; 27(4):11-9. <https://journals.sbm.ac.ir/en-jnm/article/view/17317>
- [14] Khadivzadeh T, Arghavani E. [Relationship between consanguineous marriage and fertility preferences in couples on the eve of marriage referring to health centers with premarital counseling clinic in Mashhad (Persian)]. Paper presented at: 6th Graduate Students Conference, Mashhad University of Medical Sciences. 2015; Mashhad, Iran. <https://www.sid.ir/fa/seminar/ViewPaper.aspx?ID=70031>
- [15] Khadivzadeh T, Arghavani E, Shakeri MT. [Relationship between fertility motivations and preferences in couples (Persian)]. *The Iranian Journal of Obstetrics, Gynecology and Infertility*. 2014; 17(114):8-18. [DOI:10.22038/IJOGI.2014.3414]
- [16] Khadivzadeh T, Arghavani E, Shakeri MT. [Attitude toward governmental incentives on childbearing and its relationship with fertility preferences in couples attending premarital counseling clinic in health centers in Mashhad (Persian)]. *Journal of Mazandaran University of Medical Sciences*. 2015; 24(120):1-13. <http://jmums.mazums.ac.ir/article-1-4861-en.html>
- [17] Sadeghi R. [Analysis of the socio-cultural contexts of fertility decline in Iran (Persian)]. *Socio-Cultural Research Journal of Rahbord*. 2016; 5(20):217-46. <https://www.sid.ir/fa/journal/ViewPaper.aspx?id=320675>
- [18] Torabi F, Sheidani R. [A study of effective factors in tendency to fewer childbearing of 15-49 year old women residents of Tehran (Persian)]. *Journal of Woman and Family Studies*. 2019; 7(2):31-67. https://jwfs.alzahra.ac.ir/article_4476.html

- [19] Behmanesh F, Taghizadeh Z, Vedadhir A, Ebadi A, Pourreza A, Abbasi Shavazi M. [Explaining the causes of single child based on women's views: A qualitative study (Persian)]. *Iranian Journal of Epidemiology*. 2019; 15(3):279-88. <http://irje.tums.ac.ir/article-1-6387-en.html>
- [20] Jahangiri J, Ahmadi H, Tabiee M, Moltafet H. [Construction of one- child women understanding of childbearing challenges (Participants: One- child women of Ahvaz) (Persian)]. *Quarterly Journal of Social Development (Previously Human Development)*. 2014; 9(1):85-110. https://qjds.scu.ac.ir/article_11432.html
- [21] Mobasheri M, Alidosti M, Sorshajani S, Khosravi F, Khalafian P, Jalilian M. [Determination of the most important factors influencing the fertility patterns of single child and without child families in Shahr-e-Kord city in 2013 (Persian)]. *Scientific Journal of Ilam University of Medical Sciences*. 2013; 21(6):63-70. <http://sjimu.medi-lam.ac.ir/article-1-1435-en.html>
- [22] Shakerinejad Gh, Saki M, Jarvandi F, Haginajaf S. [Views of Khuzestani's men and women with single child about childbearing: A qualitative study (Persian)]. *Tolooebehdasht*. 2017; 15(5):81-94. <http://tbj.ssu.ac.ir/article-1-1653-en.html>
- [23] Yousefi-Nayer M, Poorolajal J, Cheraghi Z. Reasons behind the tendency toward the only child in Iranian families: A conventional content analysis study. *Shiraz E-Medical Journal*. 2019; 20(8):e82916. [DOI:10.5812/semj.82916]
- [24] Razavizadeh N, Ghafarian E, Akhlaqi A. [Grounds for low child seeking and delay in child bearing (Case study: Mashhad women) (Persian)]. *Strategy for Culture*. 2015; 8(31):73-98. http://www.jsfc.ir/article_14922.html
- [25] Afarini FS, Akbari N, Montazeri A. [The relationship between social support and the intention of childbearing in women of reproductive age (Persian)]. *Payesh*. 2018; 17(3):315-28. <http://payeshjournal.ir/article-1-50-en.html>
- [26] Torkian Valashani S, Zamani Alavijeh F, Heidari Z, Shoushtari Moghadam E. [Fertility desire: Facilitators and inhibitors (Persian)]. *Payesh*. 2019; 18(3):241-9. <http://payeshjournal.ir/article-1-1067-en.html>
- [27] Montano DE, Kasprzyk D. Theory of reasoned action, theory of planned behavior, and the integrated behavioral model. In: Glanz K, Rimer BK, Viswanath K, editors. *Health Behavior and Health Education: Theory, Research, and Practice*. San Francisco, CA: Jossey-Bass; 2008. <https://books.google.com/books?id=1xuGErZCfbsC&vq>
- [28] Jalali M, Shamsi M, Roozbahaei N, Kabir K. [The effect of health education based on theory of planned behavior on behavioral promotion of urinary infection prevention in pregnant women (Persian)]. *Journal of Jahrom University of Medical Sciences*. 2014; 12(3):49-57. [DOI:10.29252/jmj.12.3.49]
- [29] Jalambadani Z, Garmaroodi GR, Yaseri M, Tavousi M, Jafarian K. Education based on theory of planned behavior over sexual function of menopausal women in Iran. *Journal of Mid-Life Health*. 2017; 8(3):124-9. [DOI:10.4103/jmh.JMH_44_17] [PMID] [PMCID]
- [30] Pakpour Hajiagha A, Mohammadi Zeidi I, Mohammadi Zeidi B. [The impact of health education based on theory of planned behavior on the prevention of AIDS among adolescents (Persian)]. *Iran Journal of Nursing*. 2012; 25(78):1-13. <http://ijn.iuums.ac.ir/article-1-1363-en.html>
- [31] Ajzen I. The theory of planned behavior. In: Van Lange PA, Kruglanski AW, Higgins ET, editors. *Handbook of Theories of social Psychology*. Vol. 1. London: SAGE Publications Ltd; 2012. p. 438-459. [DOI:10.4135/9781446249215.n22]
- [32] Saffari M, Shojaeizadeh D, Ghofranipour F, Heydarnia A, Pakpour AH. [Theory of reasoned action and theory of planned behavior. health education and promotion: Theories, models and methods (Persian)]. Tehran: Asar Sobhan; 2012. <http://opac.nlai.ir/opac-prod/bibliographic/1714918>
- [33] Cunningham FG, Leveno K, Bloom S, Spong C, Dashe J, Hoffman B, Williams obstetrics [B. Ghazi Jahani, R. Ghotbi, Persian trans]. Tehran: Golban; 2018. <http://opac.nlai.ir/opac-prod/bibliographic/5216589>
- [34] Ajzen I. Constructing a theory of planned behavior questionnaire [Internet]. 2019 [Updated 2019]. Available from: <https://people.umass.edu/ajzen/pdf/tpb.measurement.pdf>
- [35] Hoseini Soorand A, Miri MR, Sharifzadeh GR. [Effect of curriculum based on theory of planned behavior, on components of theory in patients with hypertension (Persian)]. *Journal of Birjand University of Medical Sciences*. 2015; 22(3):199-208. <http://journal.bums.ac.ir/article-1-1778-en.html>
- [36] Caplescu R. Using the theory of planned behaviour to study fertility intentions in Romania. *Procedia Economics and Finance*. 2014; 10:125-33. [DOI:10.1016/S2212-5671(14)00285-8]
- [37] Fishbein M, von Haefen I, Appleyard J. The role of theory in developing effective interventions: Implications from Project SAFER. *Psychology, Health & Medicine*. 2001; 6(2):223-38. [DOI:10.1080/13548500123176]
- [38] Fishbein M, Cappella JN. The role of theory in developing effective health communications. *Journal of Communication*. 2006; 56(Suppl_1):S1-17. [DOI:10.1111/j.1460-2466.2006.00280.x]
- [39] Dommermuth L, Klobas J, Lappegård T. Now or later? The theory of planned behavior and timing of fertility intentions. *Advances in Life Course Research*. 2011; 16(1):42-53. [DOI:10.1016/j.alcr.2011.01.002]