Original Article

The effect of transtheoretical model-based education on reproductive age woman's decision making toward childbearing

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Abstract

Context: Childbearing is the most important determinants of population fluctuations. Childbearing decision-making is one of the most important issues in couple's life.

Aim: This study was done to determine the effect of transtheoretical model-based education on reproductive age woman's decision-making toward childbearing.

Setting and Design: This quasi-experimental study was done in nine urban community health centers in Amol city in Iran in 2017.

Materials and Methods: In this study, we used multistage random sampling method was conducted among 75 reproductive age women (38 in the intervention group and 37 in the control group). Education in intervention group conducted in five sessions (specific content for precontemplation, contemplation, and preparation group) and continued in weekly online sessions (for 6 months). Control group got education according to routine program from health centers. All participants evaluated by demographic and decision-making questionnaires (based on transtheoretical model) before, 3, and 6 months after education.

Statistical Analysis Used: Mean, standard deviation, frequency, *t*-test, repeated measures ANOVA, Mann–Whitney U, and Generalized Estimation Equation Test used.

Results: The mean (standard deviation) of childbearing decision-making scores in education and control groups were as following: in the preeducation, 99.00 (16.60), 97.07 (13.34), 3 months later 109.34 (17.81), 98.44 (15.60), and 6 months after education 107.06 (16.73), 94.59 (15.24), respectively. Repeated measurement showed a significant difference in woman's decision-making toward childbearing within and between the education and control group by time ($P = 0.001$).

Conclusion: The educational program based on the transtheoretical model had a positive effect on reproductive age women's decision-making toward childbearing.

Keywords: Childbearing, Decision making, Education, Fertility, Trans theoretical model

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INTRODUCTION

Fertility and childbearing are the most important determinants of population change.[1-4] Childbearing and fertility motivation are complex issues that are linked to behaviors, ideological,[5] social, economic, and cultural factors[6] and play an important role in socioeconomic development of the society.[3,6] Decision-making about childbearing is one of the most important events of couple's life.[1]

In the past few decades, the world has affected by many population changes, and now the decline in population and its aging and low fertility is a major concern in many developed countries.[7] Iran has experienced a sharp drop in fertility rates in recent decades.[8] Decreasing fertility rates and extending human life span an aging population, which has many consequences, as it increases total dependency[9] and disrupts the age balance of the country. It has a great economic and social impact on society, but childbearing can affect the composition and structure of the country population at this time.[10] In countries with large populations of elderly, the government has to pay a lot for pensions and health care.[1]

Being a parent is a role that never ends and parenting is one stages of person's mental development.[11,12] On the other hand, infertility can lead to endometrial cancer,[13] breast cancer,[14] and ovarian cancer.[15] Therefore, considering the positive effect of childbearing on physical and mental health of reproductive age's women, childbearing is considered a healthy behavior. Childbearing desire is the strongest predictor of fertility behavior.[5] Decision to have child is not make by chance, but it depends on couples attitudes about the consequences of having another child and their perceived norms.[16]

Models and theories guide health education and promotion activities. They can answer planner's questions about why people do not have the desired behavior, how to change and what factors should considered in evaluating educational programs.[17] They helps us to analyze how childbearing behavior occurs. The transtheoretical model used in the present study includes four structures: stages of change, process of change, self-efficacy, and decisional balance.[18] This model is unique among other health education models and shows the temporal dimensions of behavior change. The whole process can take from 6 months to 5 years. Because of its emphasis on different stages of behavior change, this model also known as behavior change model.[19]

Effectiveness of this theory on diet,[20] exercise,[21] contraception, and sexually transmitted diseases,[22] smoking quit and alcohol abstinence,[23] and breast and cervical cancer screening[24] has been validated in various studies. We did not find any interventional study about healthy childbearing program based on this model. However, among transtheoretical model-based educational research in fertility field to encourage people to do healthy reproductive behaviors, we can mention studies in following issues: folic acid consumption to maintain reproductive health in pregnant women,[25] prevent alcohol use during pregnancy,[26] and proper physical activity during pregnancy.[27] In educational program based on this model aimed at preventing sexually transmitted diseases in 1996,[28] and in 2013,[29] also in study aimed on screening for bowel and anal cancer in 2015,[30] and in the same study in 2011[31] reported different results about the effectiveness of this model.

Population policies of each country play an important role in removing population imbalances and its problems,[10] considering population policies in Iran. The current study was designed according to the findings about the effect of this educational model on behavior change and also the unavailability of a study on the effect of this educational model on decision-making for childbearing. The present study done to determine the effect of transtheoretical model-based education on reproductive age women's decision-making toward childbearing.

MATERIALS AND METHODS

This quasi-experimental study approved by 3112 Code at Research Council and Ethics Committee of Mazandaran University of Medical Sciences and registered with IRCT2017083131117N4 at Iranian Clinical Trial Registration Center in Amol city in Iran at 2017.

The Hsiu-Hung Wang study results used to determine sample size,[32] the mean and standard deviation of the childbearing attitude score (intervention group [13.80 ± 0.32] and control group [13.50 ± 0.32]), calculated in G-power software, considering 95% confidence interval, 90% test power for 2 test ranges, and using the comparison formula between two averages of childbearing attitude score equal to 58 people (29 people in the intervention group and 29 people in the control group). To prevent the negative impact of sample shedding, 30% added to sample size, and finally 38 samples placed in each groups by multistage random sampling method, between 18 Amol comprehensive urban health centers located in four urban areas. From each urban area, one center as intervention group and one center as control group selected randomly; due to not providing the required number of samples in the intervention group, another center (among the remaining

ten centers) was randomly selected without considering the specific urban area and finally sampling was performed in nine centers. Sampling from centers (five centers for the intervention group and 4 centers for the control group) performed through the integrated electronic health system. Each person's row number referenced in the list extracted from the health system database. After announcing the proposed number by the Random Generator Software, we contacted with samples and invited them to cooperate in study after describing research conditions.

Include criteria were being in precontemplation, contemplation, and preparation groups (based on transtheoretical model), fertile women, age range of 18–35 years, living with husband, having 2 or less child, not planning for current or subsequent pregnancy despite the desire to have child, 2 years married, use of contraception, 3 years apart from previous pregnancy, <3 cesarean sections, being in the middle and upper socioeconomic class (above 8 Score based on the socioeconomic status questionnaire),[33] having no marital conflicts (79–149 Score based on the Marital Conflict questionnaire [MCQ]).[34] Exclude criteria was; failure to attend training session, unwillingness of person or her husband to childbearing or participation in research, severe marital conflicts during the study, chronic disease, or any type of prohibition for childbearing during research. In this study, four questionnaires were used.

1. The first questionnaire was demographic information form that includes three parts: sociological (Spouse's and Wife's level of education, Spouse's and Wife's Level of occupation, Monthly income, Housing situation), demographic (Number of children, Spouse's and Wife's age, and last child's age), and obstetrics (Cesarean section in previous pregnancies, Contraceptive method, Childbirth problems in previous pregnancies) information
2. The second was MCQ, designed by Tahereh Barati *et al*. in 2000. The questionnaire measures eight dimensions of marital conflict and has 54 questions set on a Likert scale ("always" to "never"). The "never" option has 1 point and the "always" option has 5 points. The maximum total score of the questionnaire is 270 and the minimum is 54. The classification of the level of marital conflict is as follows: excessive conflict (150–186), Normal conflict (79–149), extreme conflict or vulnerable relationships (more than 187). The content validity of the questionnaire was appropriate and its reliability was 0.96 calculated by Cronbach's alpha[34]
3. The socioeconomic status questionnaire designed by Islami *et al*. in 2013. The scoring scale of this questionnaire set on Likert scale ("very low" to "very high"), "very low" option has 1 point and "very high" option has 5 point. The socio-economic classes were as follows: very low 4, low 5–8, medium 9–12, high 13–16, and very high 17–20. The content validity of the questionnaire was appropriate, and its reliability was 0.86 calculated by Cronbach's alpha[33]
4. The childbearing decision-making questionnaire based on transtheoretical model was researcher-made and included: stages of change, process of change, decisional balance, and self-efficacy. The first structure determines the stage of childbearing behavior arranged in the following steps:
    1. Intention to have child for more than 6 months (precontemplation)
    2. Intention to have child <6 months (contemplation)
    3. Intention to have child within next month (preparatory)
    4. Trying to have child <6 months ago (action)
    5. Trying to have child over the past 6 months (maintenance).

The decisional balance structure was adjusted with 13 questions (7 questions related to "benefits of childbearing" and 6 questions related to "disadvantages of childbearing" on the Likert scale ("strongly agree" to "strongly disagree"). In "benefits" section, questions 1–7, the "strongly disagree" option has 1 score and "strongly agree" option has 5 score. In the "disadvantages" section, questions 8–13 the scoring was reversed. The maximum score of decisional balance structure was 65 and the minimum was 13. Higher score of decisional balance indicates a better state of structure.

The change of process structure was set on 10 questions on a Likert scale ("always" to "not at all"). "Not at all" option has 1 score and "always" option has 5 score. The maximum structural score of this structure was 50, and the minimum was 10. Higher score of change process indicates a better state of structure.

The self-efficacy structure was designed by six 6 questions on Likert scale I completely disagree ("I'm absolutely sure" to "I completely disagree"). The "I completely disagree" option has 1 score, and "I'm absolutely sure" option has 5 score. The maximum structural score of this structure was 30 and the minimum was 6. Higher score of self-efficacy indicates a better state of structure. The content validity of this questionnaire was appropriate. The Content Validity Index is 93.9 and the Content Validity Ratio is 87.7 and its reliability is 0.70 calculated by Cronbach's alpha.

Educational and control groups were completed childbearing decision-making questionnaire (stages of change structure) to identifying the behavioral group (precontemplation,

contemplation, and preparation). In educational group, the time and place of class was informed by phone and they were trained in her own class (dedicated educational content) in conference hall of Imam Reza Hospital in Amol at five weekly sessions (precontemplation and contemplation group have two training sessions and preparation group have one session) For an hour in each sessions by specific content [Table 1] and different methods for each group such as: lecture with slide shows, questions and answers, group discussions, and small group meetings (BUZZ). After face-to-face training, online education conducted weekly for 6 months. The control group received routine training according to the instructions of the Ministry of Health from the relevant center. Both intervention and control groups completed childbearing decision-making questionnaire based on transtheoretical model and were evaluated 3 and 6 months after education.

Obtaining permission from the relevant authorities in each health center before sampling, using an anonymous questionnaire, completing a written consent to participate in the study (with spouses' consent), providing full explanations before the intervention to all participants about the objectives and process of the study. Confidentiality of information about participants and observance of codes of ethics in medical research were some of the ethical considerations that we addressed in this study.

Statistical analysis performed using SPSS 18 (SPSS Inc., Chicago, IL, USA). Kolmogorov–Smirnov test was used to evaluate the normality of variables. We used methods based on descriptive statistics such as mean and standard deviation for quantitative variables and absolute and relative frequency for qualitative variables (qualitative demographic variables and childbearing stages of change behavior). Independent *t*-test was used to compare quantitative, and Fisher and Chi-square tests were used for qualitative demographic variables between two groups. T-test and Mann–Whitney test were used to compare quantitative variables between the groups and to evaluate the changes in the mean scores of decisional balance and process of change structure by the time, the repeated measures ANOVA was used. To evaluate the changes in self-efficacy structure (no normal distribution) before and after the education, the generalized estimation equations test (GEE) was used. Significance level for all tests considered to <0.05.

Table 1: Content of educational sessions in intervention group

Precontemplation
First session
Healthy fertility
The importance of childbearing (sociology)
Benefits of childbearing and the consequences of delaying childbearing
Second session
Single child problems
Discontinue contraceptive methods
Healthy lifestyle before pregnancy
Contemplation
First session
Healthy fertility
Discontinue contraceptive methods
Second session
Healthy lifestyle
Preconception care
Preparation
Healthy fertility
Preconception care
Maternal and fetal health and teratogens
Informing about proper pregnancy care and fetal screening

RESULTS

The results in Table 2 show that the demographic characteristics of 75 reproductive age women (37 in intervention group and 38 in control group) in two groups were similar. After sampling, one woman in the control group removed from the study due to severe automobile accident.

In order to check the assumptions of tests of the impact of transtheoretical model-based education on childbearing decision-making variable, process of change, decisional balance, and self-efficacy structures, Kolmogorov–Smirnov test showed that all the variables (except self-efficacy) have a normal distribution. The Mauchly's test was not significant for the process of change structure ($P = 0.178$), and sphericity is assumed. Mauchly's test was significant in the childbearing decision-making variable ($P = 0.002$) and the decisional balance structure ($P = 0.007$), Greenhouse-Geisser examined was used for both variables.

According to repeated measurement test, changes in childbearing decision making scores and its components (process of change and decision balance) were significant between education and control group by the time. Compared to preintervention, the scores increased during the study in the education group but not in the control group. There were also significant differences between the groups after 3 and 6 months from intervention [Table 3, 4]. The results of GEE showed similar changes for self efficacy within and between the study groups [Table 4].

DISCUSSION

According to search by research team, there was not access to any interventional study that examined the effect of transtheoretical model-based education on childbearing

Table 2: Demographic characteristics in education and control groups

Variable	Category	Group		*P*
		Education (*n*=38), *n* (%)	Control (*n*=37), *n* (%)	
Spouse's age (years), mean±SD[a]		33.87±3.46	32.89±4.28	0.335*
Wife's age (years), mean±SD		29.37±3.23	28.89±3.55	0.572*
Last child's age (years), mean±SD		5.47±4.51	4.26±3.96	0.344*
Number of children[b]	No child	10 (26.3)	13 (35.1)	0.383**
	1-2 child[#]	28 (73.7)	24 (64.9)	
Spouse's level of education	Below diploma	9 (23.7)	11 (29.7)	0.517***
	Diploma	15 (39.5)	10 (27)	
	BSc and above	14 (36.8)	16 (43.2)	
Wife's level of education	Below diploma	3 (7.9)	5 (13.5)	0.601**
	Diploma	17 (44.7)	13 (35.1)	
	BSc and above	18 (47.4)	19 (51.4)	
Spouse's level of occupation	Employee	8 (21.1)	4 (11.8)	0.389***
	Freelance job	30 (78.9)	33 (88.2)	
Wife's level of occupation	Housewife	28 (73.7)	25 (67.6)	0.531**
	Employee	2 (5.3)	5 (13.5)	
	Other	7 (18.9)	8 (21.1)	
Monthly income	Under 1 million toman	7 (18.4)	5 (13.5)	0.591**
	1-2 million toman	24 (63.2)	27 (73)	
	Over 2 million toman	7 (18.4)	5 (13.5)	
Housing situation	Owner	16 (42.1)	19 (51.4)	0.743**
	Tenant	18 (47.4)	15 (40.5)	
	Living with spouse's family	4 (10.5)	3 (8.1)	
Cesarean section in previous pregnancies	Never	25 (65.8)	27 (73)	0.500**
	Once or more[†]	13 (34.2)	10 (27)	
Contraceptive method	Withdrawal method	25 (65.8)	29 (78.4)	0.505***
	Condom	11 (28.9)	7 (18.9)	
	Others	2 (5.3)	1 (2.7)	
Childbirth problems in previous pregnancies	Without problem	26 (68.4)	24 (64.9)	0.149***
	Abortion	3 (7.9)	4 (10.8)	
	Hard labor	6 (15.8)	2 (5.4)	
	Others[‡]	3 (7.9)	7 (18.9)	

[a]Mean±SD, [b]*n* (%),*T-test, **Fisher's exact test, ***Chi-square test, [#]Only one member of control group had two children, so women who had one or two children merged into one group, [†]Only one member of education group had two cesarean section, so women who had more than one cesarean section merged into one group, [‡]In the section of previous pregnancy and childbirth problems, in education group, cases such as placental abruption (2 people), placenta accreta (1 person), and in control group, preterm labor (2 people), placental abruption (2 people), gestational diabetes (1 person), placental acreta (2 people) were merged in other cases group. SD: Standard deviation

behavior. Therefore, initially, we focused on educational researches that not based on transtheoretical model. Then, by discussing changes in the structures of this model, such as self-efficacy, decisional balance, process of change, and stage of change, which are the constituent elements of the decision-making variable, can analyze the occurrence of changes in women's childbearing decision behavior.

The results of our study showed that transtheoretical model-based education could improve women's decision-making toward childbearing. Among nonmodel-based educational-oriented researches on fertility, aimed to affect women's fertility decisions, can mentioned a study in 2011 that showed group health education was able to affect women's childbearing decision,[32] and in another study in 2013 aimed to prevent delayed childbearing, education was effective.[35] Due to limited intervention research in this field, it cannot state conclusively that education was an influential factor on women's decision-making about having child, and it seems necessary to investigate further interventions in this regard.

The findings of the present study showed that education based on the transtheoretical model could affect women's self-efficacy structure toward childbearing. In studies based on this model, such as the study of gonorrhea and chlamydia screening in 2001,[36] a study in 1998 to use condom in high-risk women with HIV infection,[28] and in study that conducted in 2010 to encourage folic acid consumption[25] women's self-efficacy improved after training. The results of the above studies were consistent with the results of our study. However, in study, conducted in 2007[28] to encourage using condom as contraception to reduce unwanted pregnancies, women's self-efficacy after training did not increase. Various studies confirmed that education based on transtheoretical model could improve women's self-efficacy in behaviors related to reproductive health. However, in situations where there is a negative attitude about behavior (using condoms as contraception),[28] the quality of education needs to be improved.

The findings of the present study showed that transtheoretical model-based education could have a positive effect on

Table 3: Comparison of childbearing decision-making scores in education and control groups before, 3 and 6 months after education

Group	Mean±SD			Within group**	Between group**	Time effect**	Group effect**
	Pre education	3 months after education	6 months after education				
Education	99.00±16.60	109.34±17.81	107.06±16.73	*P*<0.001	*P*<0.001	0.001	0.015
Control	97.07±13.34	98.44±15.60	94.59±15.24				
*P**	0.581	0.006	0.001		0.018		

**T*-test, ***Repeated measures ANOVA. SD: Standard deviation

Table 4: Comparison of childbearing decision components in education and control groups before, 3 and 6 months after education

Decision components	Group	Mean±SD			Within group***	Between group***	Time effect***	Group effect***
		Pre education	3 months after education	6 months after education				
Process of change	Education	34.04±7.45	37.44±8.36	36.63±7.18	0.002	*P*<0.001	0.020	0.012
	Control	32.20±5.94	32.44±8.28	31.36±7.23				
	*P**	0.243	0.011	0.002	0.323			
Decisional balance	Education	42.93±6.45	47.81±6.49	46.10±7.25	*P*<0.001	*P*<0.001	0.003	0.031
	Control	42.74±6.45	43.59±7.11	41.31±6.10				
	*P**	0.902	0.009	0.003	0.005			
Self-efficacy	Education	20.45±4.61	22.08±5.46	22.01±4.11	0.016****	*P*<0.001****	*P*<0.001****	
	Control	20.50±4.61	20.59±5.15	19.89±4.79				
	*P***	0.936	0.171	0.039	0.328****			

**T*-test, **Mann-Whitney *U*, ***Repeated measures ANOVA, ****Generalized estimation equations. SD: Standard deviation

women's decisional balance structure about childbearing. A study aimed at encouraging folic acid consumption in 2010[25] to maintain reproductive health; the mean scores of women's decisional balance were improved after training. In another study conducted in 2018[26] aimed on preventing alcohol consumption during pregnancy in high-risk women, training was effective, also in another study in 2011,[27] which aimed to encourage pregnant women to do proper physical activity, education was effective. However, in a study conducted in Rural health centers[28] to encourage using contraception to reduce unwanted pregnancies, the mean scores of women's decisional balance after training did not increase. Based on above studies, we can say with more power that trans-theoretical model-based education can create a good balance between the benefits of doing a behavior compared to its disadvantages (decisional balance structure) in women's reproductive health behavior. In cases that the results were not consistent,[28] it is necessary to explain the benefits and disadvantages of behavior by citing scientific reasons to be accepted.

The findings of this study showed that transtheoretical model-based education could affect women's childbearing process of change structure. In different researches such as study in 1999[29] to encourage pregnant women to breastfeeding after delivery, or study in 2013 to prevented smoking in pregnant women,[30] and in another study in 2004 on gonorrhea and chlamydia screening,[31] transtheoretical model-based education showed a positive effect on process of change structure. Based on these results, can said that training based on transtheoretical model could improve process of change structure of reproductive health behaviors in women.

The transtheoretical model-based education could not improve the stages of women's childbearing behavior.[37] It seems to be that the improvement of behavioral stage in control group was illusive and due to the lack of preconception care.

Education can promote childbearing healthy behavior by expressing risks of delay it, but some factors arising from the change in society's attitude, can hardly corrected during, training. This finding confirm the complexity and multifactorial nature of childbearing[38] that most important of these are economic factors,[39] which can solved by governmental intervention.

The limitation of this study was the inability to control all factors that effect on childbearing, because childbearing is affected by many factors. One of these factors was the attitude of men towards childbearing. To eliminate the confounding effect of men's attitudes on decision-making about childbearing before the intervention, men's attitudes about childbearing were questioned, and only women whose husbands agreed to have child were included in the study.

CONCLUSION

One of ways to achieve suitable quantitative and qualitative population is informing country's fertile population by midwives regarding benefits of healthy childbearing at individual and societal level. It can see with more power that the mechanisms in transtheoretical model-based education toward childbearing, which pays attention to target population's educational needs, can transform

community members' attitude toward this issue, and have an effective solution to achieve current demographic policy goals. Carrying out the present educational intervention on couples, comparing this educational intervention in women whose husbands agree with childbearing with women whose husbands do not agree with childbearing, conducting longitudinal studies with focus on knowledge, attitudes, and decisions about childbearing is suggested.

Conflicts of interest

There are no conflicts of interest.

Authors' contributions

S. Khani supervised the all stages of this studythis study. A. Naghibi, F. KhalajAbadi Farahani, M. Moosazadeh was the study advisor. M. Ansari Majd contributed with study conception, data collection, and drafting the manuscript. All the authors critically evaluated the paper and provided the final draft.

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