

# The Impact of Implementing Steps of Empowerment Model for Women with Failed Pregnancies on Decisional Conflict for Re-pregnancy: A Randomized Controlled Trial

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## Research

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# Abstract

**Background:** Failed pregnancy is a common and destructive experience. It has physical and psychological effects on both women and families. They may become reluctant to re-pregnancy. Providing the coping strategies can help to adapt to failed pregnancies, and make informed decisions about future pregnancies. This study was designed and performed to determine the effect of implementing steps of empowerment model for women with failed pregnancies on decision conflict for re-pregnancy.

**Method:** This interventional research is a randomized controlled trial with a control group that was conducted in Iran from January 2020 to May 2020. Participants were 80 women who had been hospitalized in a referral center during past 3-6 weeks due to failed pregnancies. The eligible women with random allocation of sealed envelope site were divided into two groups of intervention ( $n=40$ ) and control ( $n=40$ ) and a separate code was determined for each person. The intervention was performed in four, 90-minute sessions based on the model steps (threat perception, problem solving, educational participation, and evaluation) for intervention group. O'Connor's decisional conflict scale was completed before and six weeks after intervention by both of groups. Data were analyzed using SPSS edition 16 with the independent T-test, Fisher and *chi-squared tests*.

**Results:** The score of decisional conflict and, its subscales did not differ between the two groups before the intervention ( $P = 0.65$ ), but six weeks after the intervention, the decisional conflict and, all its subscales in the intervention group reduced. ( $P < 0.001$ ).

**Conclusion:** Empowerment education in women with a failed pregnancy improved their decision conflict in re-pregnancy, so empowerment education along with health care services for women with failed pregnancies is recommended.

**Trial registration:** This randomized control trial was registered on the TCTR site with the code TCTR20191226001. Registered on 26 December 2019.

## Plain English Summary

Failed pregnancy as a common experience is especially shocking to those who are unaware of the event. Many of these parents describe the loss of pregnancy as a critical event that is associated with worry and uncertainty about the outcomes of future pregnancies. This uncertainty lead to decisional conflict. In general, decisional conflict results from unawareness of personal values, risks, and benefits of choosing each option, feeling pressured by the others, not receiving support in choosing that this can be minimized with empowerment interventions. The present study was conducted to assess the effectiveness of the implementing steps of empowerment model for women with failed pregnancies on decisional conflict in re-pregnancy. This interventional research is a randomized controlled trial with a control group that was conducted in Iran from January 2020 to May 2020. Participants were 80 women who had been hospitalized in a referral center during past 3-6 weeks due to fail pregnancies. The eligible women with

random allocation sealed envelope site were divided into two groups of intervention (n=40) and control (n=40). The intervention was performed in four, 90-minute sessions based on the model steps (threat perception, problem solving, educational participation, and evaluation) for intervention group. For evaluation O'Connor's decisional conflict scale was completed before and six weeks after intervention by both of groups. The findings from this study demonstrated that empowerment significantly improved decisional conflict in the intervention group compared to the control group. So empowerment education along with health care services for women with failed pregnancies is recommended.

## Background

Unintended termination of pregnancy or loss of a pregnancy product, from the beginning of pregnancy to birth, is called failed pregnancy [1], which as an influential and common experience can cause a lot of psychological stress to the family, and specifically to the mother [2].

Each year approximately 2 million women are affected by fetal loss [3]. Annually, about 1 in 6 recognized pregnancies result in miscarriage, and for every 200 births, 1 stillbirth takes place. Over 10000 ectopic pregnancies are diagnosed each year [4]. In Iran, 13 stillbirths per 1000 live births have been reported [5], but accurate statistics on miscarriage rates in Iran are not available, and from 70.45 to 116.9 miscarriage per 1000 live births are reported [6].

The occurrence of a failed pregnancy can be shocking, especially for those who are unaware of the event [7]. Most of these parents describe the loss of pregnancy as a critical event that is associated with vulnerability, anxiety, and uncertainty about the outcomes of future pregnancies [8]. Although some of these women try to adapt well to the situations occurred, others may suffer from long-lasting adaptation problems [9]. Researchers have found that some causes of this maladaptation include, poor family and community support, lack of other children, lack of self-confidence in the mother, fear of husband separation, and fear of increasing number of lost pregnancies, being ignored by the health care providers, having a record of infertility, and fear of re-pregnancy that can also, exacerbate the problem [10].

Generally, mothers with a fetal or neonatal death are reluctant to re-pregnancy [11]. Re-pregnancy can have a positive effect on mental stress caused by a lost pregnancy [12], but the feeling of doubt and hesitation in parents with the experience of a lost pregnancy is multiplied by the fear of losing the pregnancy again [9]. In general, decisional conflicts result from uncertainty and, unawareness of personal values, risks and benefits of choosing each option, feeling pressured by others, not receiving support in choosing, and not being awareness of alternatives that can be minimized with educational and supportive interventions [13]. A systematic review by Stacey et al. (2017) shows the effectiveness of decision support methods such as pamphlets, videos, the internet tools, and training, in the face of hesitation and conflict in health care and screening decisions regarding awareness, individual values, and decision support, satisfaction, and confidence in the decision [14].

On the other hand, it is very important to be medically and emotionally prepared for the next pregnancy [15]. Allahdadian et al. (2019) in an interview with a number of such women found that most of these

mothers had no information to prepare for next pregnancy and prevent it from happening again [16]. The best way to improve the situation of parents with a failed pregnancy is to listen to them and make time for them, to give them awareness and information, to involve them in making relevant decisions, and to take their concerns seriously [17]. By empowering, individuals can identify the problem roots, and its consequences, and make decisions to find solutions to the problem, and consider themselves as responsible for changing their behavior [18]. One of the patterns of local empowerment in Iran is the model of Alhani empowerment. In this model, indicators of empowerment involve: 1) perceived threat, awareness of the complications, and problems of a particular disease or health condition, 2) problem solving by the individual by performing preventive behaviors and taking appropriate reactions and create a sense of self-efficacy, trust and confidence in self-care and 3) transfer of learning to the people involved [19], improvement of one's self-esteem and positive attitude towards oneself and self-control, and increasing the sense of responsibility towards behaviors and 4) behavior evaluation. In implementing this model, more emphasis is placed on responsibility and cooperation with a focus on existing capacities, this model is likely to be a good practical solution in promoting self-care [20]. At present, training classes are held for pregnant Iranian women, but despite the obvious importance of empowering injured women with failed pregnancies, there are no guidelines for empowering these women, and their families. Given the importance of improving the health of mothers and future generations, and according to the description of midwives' duties in the psychological and emotional support of women and families in all dimensions, and because of the availability of midwives for these women, the research team decided to conduct a study aimed at determining the role of implementation of empowerment model steps (perceived threat, problem solving, educational participation, evaluation) [21], on decisional conflict in re-pregnancy in women with failed pregnancies.

## Methods

This research is an interventional study of a randomized controlled trial with two parallel groups (Intervention and control groups).

### Participants

This study was conducted in Shahid Akbarabadi Educational and Medical Center in Tehran, Iran. The criteria for entering the study included the reading and writing literacy, being married, being Iranian, no medical prohibition for pregnancy, no children, desirable lost pregnancy, no self-reported of taking drugs and psychotropic substances, not having any mental illnesses at present or in the past as expressed by the participant, no pregnancy after the failed pregnancy, pregnancy loss history of up to 2 cases, and not having infertility problems. The criteria for being excluded from the study involved occurrence of any stressful events (divorce, financial crisis, death of the immediate family members, etc.) during the study, not attending at least two sessions of training sessions, and becoming pregnant during the study.

### Study Instrument

Data collection tools included demographic questionnaire, containing 17 questions (age, education and employment status of couples, economic status, duration of the marriage, number of pregnancies, age of women during the first pregnancy, cause of failed pregnancy, the gender of the lost fetus, number of lost pregnancies, delivery type, and the current preferred method of contraception) and O'Connor's Decisional Conflict Scale, which includes a question about the person's choice of pregnancy in the future, and 16 questions with five decisional sub-domains (three questions about the informed subscale, three questions about value clarity, three questions about decision support, and three questions in the uncertainty sub-domains, and finally four questions about an effective decision. According to the questionnaire guide, the questions were answered with a 5-point scale yes (0), possibly yes (1), uncertain (2), possibly no (3), and no (4). In each of the sub-domains, the sum of the scores of the questions was first calculated and then divided by the number of questions and after that, the division result was multiplied by 25, and the range of scores was from zero to 100. In summing up the scores, the closer the total score was to 100, the more the conflict signs (uncertain and delayed decisions) were, and the lower the score was, the less the decisional conflict (the more confident decisions) was (zero was a sign of non-conflict in decision-making and 100 was a sign of maximum decisional conflict).

The original version of the decisional conflict questionnaire was developed by O'Connor (1993) involving 16 questions to review decision-making, and was revised in 2005 and updated in 2010. For the original version of this tool, optimal validity and correlation were reported with the optimal re-testing method and the Cronbach's alpha coefficient was 0.78 [22]. In a study by Ghiyavandian et al. (2013) the validity of the decisional conflict scale was calculated with Cronbach's alpha coefficient of 0.94 [23]. Moudi et al. (2018) reported tool reliability as 0.92 [24].

In this study, the content validity was used to determine tool validity. For face validity, the decisional conflict tool was given to 20 women with a failed pregnancy and the levels of difficulty (difficulty in understanding words and phrases) and ambiguity (possible misunderstandings of phrases or semantic incompatibility of words) were identified. The reliability of this study was evaluated by two methods of Cronbach's alpha and test re-test and tools were given to 20 women with failed pregnancies, and then were given to them again two weeks later and the internal correlation of the questions was calculated with Cronbach's alpha coefficient of 0.869. It was 0.749 for the subscale of awareness, 0.734 for the subscale of individual values, 0.655 for decision support, 0.710 for confidence, and 0.778 for effective decision-making. Repetition by Pearson correlation coefficient for the total instrument of decisional conflict was 0.986 and 0.946 for subscales of awareness, 0.967 for recognition of individual values, 0.901 for decision support, 0.946 for confidence, and 0.993 for effective decisions.

## Interventions

This study was conducted from January 2020 to May 2020 on 80 women who had been hospitalized during 3-6 weeks ago due to fail pregnancy. To select the samples, with the permission of the hospital management, the researcher continuously referred to the hospital's medical records unit, extracted the names of women with failed pregnancies in the last 3-6 weeks. Then called them by phone and, selected

the eligible participants to enter the study and after explaining the objectives of the study, and the educational content and the number of training sessions and the possible results and applications for the participants, invited them to participate in the project on a specific day, date and time. The participants in the project were assured that all information was confidential and the written informed and free consent was obtained from them. Prior to the start of the study, the demographic questionnaire and the decisional conflict scale were distributed to be complete by all participants (control and intervention) in an appropriate position, and a quiet place in the research environment. In cases where the research units needed explanations for the completion of the questionnaire, the guides were provided by the researcher. After collecting the questionnaires before the intervention, the implementation method of the plan and its purpose were described in details to the samples. The educational content was prepared using reference books and related descriptive articles and its validity was approved by 5 faculty members of Iran University of Medical Sciences. Samples of the control group were asked to leave the hospital and wait for a re-invitation in the next 6 weeks to complete the questionnaires again. On the same day, the first empowerment training session was performed based on the four steps (threat perception, problem solving, educational participation, evaluation) of the four 90-minute sessions (training sessions, and group discussion) over 4 consecutive weeks in 4 groups of 8-12 people in the Akbarabadi educational and medical center in a training class. The date and time of the next meeting were set with the intervention group. In this way, the empowerment support training program was implemented in groups through questions and answers, slide shows, and presentation of pamphlets to be studied by husbands at the end of each session. To increase the threat perception of the samples, it was necessary to increase their level of knowledge and understanding of a failed pregnancy and its reasons, which was improved during the training sessions. Problem-solving sessions were conducted with the participation of a team of midwifery and psychology specialists, and they were assisted by providing coping strategies, adaptations, and introductions of selected options, as well as finding solutions by the women themselves and increasing their sense of self-efficacy. Knowledge and ability and support helped them to increase their self-esteem. With increasing self-efficacy, self-esteem improved self-control. To increase educational participation, at the end of each session, an educational pamphlet was provided to the participants to transfer the content to the family, especially spouses. To implement the fourth step of the empowerment model (evaluation), the researcher evaluated the process during the sessions and at the beginning of each session (examining the degree of listening, attention, learning, interest, and mental participation) and ultimately the final evaluation was performed 6 weeks after the end of the intervention by re-completing the decisional conflict scale by both control and intervention groups. (Table 1)

**Table 1**

Program of training sessions for the intervention group

Sessions	List of educational materials based on empowerment steps
1	Greeting, defining failed pregnancy, help to emotional evacuation by personally describing the event and sharing the experience of loss and stating the dysfunctional beliefs (the <b>threat perception</b> ), providing educational pamphlets to families and explaining it by samples) ( <b>educational participation</b> ).
2	Fetal death and its causes, accepting reality, increasing understanding of the event ( <b>threat perception</b> ), ways to correct cognitive errors, managing emotions ( <b>problem solving</b> ), providing educational pamphlets to families and describing it by samples ( <b>educational participation</b> ).
3	Strategies for controlling physical and mental conditions, self-care methods and self-control and coping strategies (social support), description of reproductive process, decision making ( <b>problem solving</b> ), providing educational pamphlets to families and explaining it by samples ( <b>educational participation</b> ).
4	Goal setting, attention to individual values, self-awareness, decision-making skills, finding solutions by women themselves and helping to make informed decisions ( <b>problem solving</b> ), maternal attachment to the fetus, necessary measures before re-pregnancy, (information support), providing educational pamphlets to families and explaining them by samples ( <b>educational participation</b> ).

## Sample Size

The sample size was calculated using the following formula:

$$n = \frac{2 * (\pi_1 - \pi_2 + \pi_1 * \pi_2)^2}{\pi_1 * \pi_2} = \frac{2 * (1.96 + 0.84)^2}{(0.7)^2} = 32$$

$$\pi_{0.95} = 1.96$$

$$\pi_{0.8} = 0.84$$

The sample size was calculated to involve 32 women, taking into account the level of confidence of 95% and the test power of 80% and considering Cohen's d the effect size on the average on the decisional conflict variable in the intervention group compared to the control group (ES = 0.7); it was finalized to involve 40 people, including a 25% drop in the sample size in each group.

### **Randomization**

Each participant was given a number according to the list of eligible participants in the study, and provided a random list for two groups from Sealed Envelope site [25]. In the sealed envelope site we used simple randomization service base on block identifier, block size, sequence within the block, and group code. A list created and generate a unique randomization code. With block sizes: 4, 6, 8. we used a saved copy of this list to look up the intervention group for the given code. Eligible women with failed pregnancies based on a random list, assigned to the control (routine group, n=40) and intervention (empowerment group, n=40) groups. On the day of the clients' visit, the list was given to a colleague non-involved in the plan (secretary of the clinic) to put the names of the samples in order of entering the meeting place in the list. In this way, the samples were placed in two groups of intervention and control completely by accident and without knowing about that classification, neither by the participants nor by the researcher. The researcher's full name and telephone number was provided to the subjects to inform the researcher in case of a problem or any question.

### **Statistical methods**

Data analysis was performed using SPSS version 16 and the descriptive statistics such as frequency tables, numerical indicators and inferential statistics such as Fisher's statistical tests, chi squared, independent T-test, and paired T-test were performed, and the significant level in this study was considered as ( $p < 0.05$ ).

## **Results**

Of the total of 80 women participating in this study (40 in the intervention group and 40 in the control group) one member of the intervention group was excluded due to non-participation in training sessions because of migration, and the data analysis was performed in two groups. (Fig1)

There were no differences in demographic, and pregnancy characteristics of women and their husbands between the two groups. (Table 2).

Table 2

Demographic and pregnancy characteristics of women and their husbands and comparison of the two groups

Variable	Intervention Group (n=40)	Control Group (n=40)	P Value
Age (mean± SD), y	29.71± 5.45	30.27± 6.25	0.674 <sup>1</sup>
Husbands' age, y	33.07±4.59	33.85± 6.19	0.530 <sup>3</sup>
Marriage duration, y	4.00± 2.80	3.22 ± 2.65	0.211 <sup>4</sup>
Marriage age of wife, y	25.71± 5.64	27.15 ± 6.98	0.318 <sup>4</sup>
Wife age at first pregnancy, y	28.1 ± 5.14	29.00 ± 6.47	0.497 <sup>5</sup>
Lost fetus age (week)	11.230 ± 7.74	11.47 ± 8.04	0.891 <sup>6</sup>
Wife's education			0.529 <sup>7</sup>
Primary and secondary, N(%)	11 (28.2)	16 (40)	
High school and diploma	19 (48.7)	17 (42.5)	
Academic	9 (23.11)	7 (17.5)	
Husband's education			0.142 <sup>4</sup>
Primary and secondary	11 (28.2)	19 (47.5)	
High school and diploma	18 (46.2)	16 (40.0)	
Academic	10 (25.6)	5 (12.5)	
Wife's employment status			0.481 <sup>9</sup>
Housewife	34 (87.2)	37 (92.5)	
Employed	5 (12.8)	3 (7.5)	
Husband's employment status			0.192 <sup>10</sup>
Laborer	10 (25.6)	16 (40.0)	
Employee	9 (23.1)	4 (10.0)	
Self-employed	20 (51.3)	20 (50.0)	
Economic status			0.858 <sup>1</sup>
Favorable	9 (23.1)	8 (20.0)	
Relatively favorable	23 (59.0)	26 (65.0)	
Unfavorable	7 (17.9)	6 (15.0)	
Cause of pregnancy loss			0.42 <sup>2</sup>
Abortion	19 (48.7)	21 (52.5)	
Stillbirth	8 (20.50)	6 (15.0)	
Fetal anomalies	0 (0.0)	3 (7.5)	
Ectopic pregnancy	12 (30.8)	10 (25.0)	
Pregnancy termination method			0.560 <sup>3</sup>
Normal (vaginal delivery)	27 (62.2)	31 (77.5)	
Surgery(abdominal incisions)	3 (7.7)	1 (2.5)	
Medic (methotrexate)	9 (23.1)	8 (20.0)	
Lost fetus gender			0.998 <sup>1</sup>
Female	5 (12.8)	5 (12.5)	
Male	6 (15.4)	6 (15.0)	
Unknown	28 (71.8)	29 (72.5)	
Number of pregnancy			0.750 <sup>4</sup>
First	24 (61.5)	26 (65.0)	
Second	15 (38.5)	14 (35.0)	
Pregnancy prevention method			0.913 <sup>11</sup>
Condom	5 (12.8)	5 (12.5)	
Pill	2 (5.1)	2 (5.0)	
Normal	30 (76.9)	29 (72.5)	
No methods	2 (5.1)	4 (10.0)	

<sup>1,2,3,4,5,6</sup> Independent-T test  
<sup>3,4,5,11,12,13,14,15</sup> Chi-square test  
<sup>2,3,4,5,10,11,12,13,14,15,16</sup> Fisher's exact test

In the intergroup comparison, the independent T-test did not show a conflict between women's decision-making in two groups before the intervention ( $p = 0.65$ ). The decisional conflict score in the intervention group decreased 6 weeks after the intervention in all four sub-scales and it was significantly different compared to the control group ( $p <0.001$ ). This means that the awareness of the women in the intervention group compared to the control group was higher about the options, and the advantages, and disadvantages of each choice. Among women in the intervention group, the scores on recognition of individual values, enjoying social support, confidence in decision-making, and choice were higher, and

there was less doubt and hesitation after intervention during decision-making compared to the control group. In the intragroup comparison, the paired T-test in the intervention group showed a conflict score before and after the intervention ( $p < 0.001$ ). (Table 3).

**Table 3**

The effect of intervention on the decisional conflict scale among samples

Sub-scales	Evaluation time	Intervention	Control	Independent T-test
		Mean $\pm$ SD	Mean $\pm$ SD	
Informed	Pre- intervention	58.76 $\pm$ 24.77	51.87 $\pm$ 23.30	P= 0.20
	Post- intervention	17.9 $\pm$ 16.50	54.37 $\pm$ 24.38	P< 0.001
	Paired T-test	P< 0.001	P= 0.16	
Values Clarity	Pre- intervention	51.92 $\pm$ 22.65	55.83 $\pm$ 24.10	P= 0.46
	Post- intervention	21.58 $\pm$ 16.52	57.70 $\pm$ 23.06	P< 0.001
	Paired T-test	P< 0.001	P= 0.07	
Decision support	Pre- intervention	52.77 $\pm$ 20.35	51.66 $\pm$ 23.12	P= 0.82
	Post- intervention	16.88 $\pm$ 17.98	52.70 $\pm$ 23.74	P< 0.001
	Paired T-test	P< 0.001	P= 0.36	
Confidence	Pre- intervention	54.05 $\pm$ 22.36	60.20 $\pm$ 19.65	P= 0.19
	Post- intervention	23.93 $\pm$ 22.71	59.16 $\pm$ 22.15	P< 0.001
	Paired T-test	P< 0.001	P= 0.34	
Effective decision	Pre- intervention	42.94 $\pm$ 21.32	48.28 $\pm$ 19.04	P= 0.24
	Post- intervention	18.75 $\pm$ 21.26	47.96 $\pm$ 18.20	P< 0.001
	Paired T-test	P< 0.001	P= 0.75	
Total	Pre- intervention	51.52 $\pm$ 17.22	53.24 $\pm$ 17.04	P= 0.65
	Post- intervention	19.75 $\pm$ 17.10	53.98 $\pm$ 17.05	P< 0.001
	Paired T-test	P< 0.001	P= 0.19	

Prior to the intervention, 67.5 percent of the control group and 48.7 percent of the intervention group had chosen the option "I would not like to become pregnant right now", and the two groups did not show a statistically significant difference. Comparing the type of option selected by the women was significant after the intervention between the two groups, and the majority of the units studied by the intervention group chose the option "I would like to become pregnant again." Most of the units studied by the control group selected the option "I would not like to become pregnant right now" ( $p < 0.001$ ). (Table 4).

**Table 4**

Frequency of options selected by women with failed pregnancies in relation to again pregnancy

Choices	Before		After	
	Intervention N (%)	Control N (%)	Intervention N (%)	Control N (%)
I would like to become pregnant again	6 (15.4)	7 (17.5)	30 (76.9)	6 (15)
I would not like to become pregnant right now.	19 (48.7)	27 (67.5)	7 (17.9)	27 (67.5)
I never become pregnant	14 (35.9)	6 (15)	2 (5.1)	7 (17.5)
Test results	P = 0.097		P < 0.001	

## Discussion

Decisional conflict and contradiction in re-pregnancy among the women in the intervention group after empowerment was significantly reduced compared to the control group. Decisional conflict after training was significantly lower than that before training, and empowerment training affected the reduction of the decisional conflict. The results of the present study were consistent with the results of a systematic review by Stacey et al. (2017) aimed at examining the influence of decision support methods in the face of healthcare and screening decisions. In this study, the decision aid methods included pamphlets, videos, the Internet tools, and training on 50 decisional issues in the fields of surgery, prostate cancer screening, colon cancer, prenatal, and genetic testing. In these studies, decision support in various ways, had reduced decisional conflict in the dimensions of feeling unaware, hesitation in individual values, lack of decision support, decision dissatisfaction and uncertainty. Increasing the accuracy of the perception of risks and complications, more transparency in individual values, and individual involvement in decision-making are some results of reduction of decisional conflict that is consistent with the results of the recent research [14]. The results of a similar study by Meade et al. (2015) showed that the decisional conflict and hesitation to become pregnant after the intervention was reduced by 15% compared to the control group ( $p < 0.001$ ), and the intervention group felt support for decision-making [26]. The results of the study by Moudi et al. (2018) were in line with the present study. The decisional conflict of women in deciding to terminate the pregnancy was reduced after counseling on all sub scales of awareness, transparency of values, confidence, support, and effective decision, and it was decided to terminate the pregnancy with less conflict [24]. Carlson et al. (2019) also studied the effect of computer-aided decision-making on decisional conflict on aneuploidy screening. This showed that the decisional conflict in the intervention group decreased after receiving the computer aided decision-making to perform aneuploidy screening ( $p < 0.003$ ) [27]. The decision aid methods such as education, and counseling while raising awareness can help people to understand better their personal values, and participate in the decisions and make better decisions with more certainty based on the available evidence and options with the support of health care providers and families without being forced to make decisions.

One of the goals of health for all in the 21<sup>st</sup> century is empowerment; empowerment is defined as the process of improving self-confidence, awareness and decision-making skills to increase health and health care and improve life quality. A key component of empowering people is to participate in helping themselves and having control and ability to achieve empowerment goals [28]. Accordingly, the participation of individuals in health care and self-management is emphasized. Participation in health care is a reciprocal relationship between the individuals and the health care system or health care staff, in which the individuals participate in the provision of information to help diagnose and resolve the problem, and play an active role in that regard [29]. Also, in recent decades, the main approach of health has been to provide awareness and necessary training to change individuals [30]. Empowerment is a low-cost, practical method that can be performed by developing the individuals' innate capacity to accept responsibility for life by having sufficient knowledge and resources to make and implement logical decisions and evaluate the effectiveness of decisions [31]. One of the empowerments patterns is the Iranian model of empowerment in four steps (threat perception, problem-solving, participation in education, and evaluation) [32]. Based on that, measures are taken for participation and cooperation of the empowering and empowered parts to reduce risk factors and promote health, and emphasize capacities more than problems, and shortcomings [33]. The main goal of the family-centered empowerment model is to empower the family system (the patient and other family members) to improve the health level [30]. And one of the families members, "active family member" who has the characteristics of desire, decision-making power, and is able to cooperate, participates in the empowerment process with the priority of a spouse and child, and then the person is empowered in the family system to promote health and hygiene [19]. Planned and systematic training will increase the level of information, self-care, and satisfaction of people and reduce their level of anxiety. [34] The results of a study by Kheirkhah et al. (2014) also showed that holding group counseling sessions were effective in adapting to infertility in infertile women [35]. It is difficult to decide on the best choice, especially when there are multiple options, and the result is in a state of ambiguity, or when the choices are accompanied by advantages and disadvantages that are not of equal value to different individuals. Parents with experience of failed pregnancies always feel a sense of hesitation in trying to conceive again because of the fear of losing their pregnancy again [13]. By providing awareness to the individual and the family about the illness and crisis, complications, treatment, and self-care methods, individuals can be prepared to play an active and independent role in their decisions.

One of the limitations of this study was the absence of fathers in the educational sessions, which did not allow us to discover their beliefs, and the impact of their views and opinions on their wives' decisions. Because of the meetings did not hold for men, women's participation in classes was associated with problems; to solve this problem the researcher telephoned the participants the day before each meeting, and while reminding them of the time of the meeting by re-stating the objectives, motivated them to participate in the meeting. Meanwhile, due to time constraints on the implementation of the plan, the persistence of conflict reduction in the decision to become pregnant and the end result of taking or not taking action to re-pregnancy was not followed up. Additionally, since 3-6 weeks had passed after the loss, some mothers became indifferent and unmotivated about the event and did not easily agree to

express their feelings. Finally, it is proposed that empowerment begin with the provision of educational and supportive-psychological interventions besides the medical-care services for women with failed pregnancies, and their husbands from the very first days of the loss.

## Conclusion

According to the research results, educational and supportive interventions and empowerment can minimize decisional conflict in re-pregnancy in women with failed pregnancies. Given that midwives are the most accessible individuals for these injured women, and since no guidelines are currently implemented in hospitals and comprehensive health care centers for empowering these women, and their families after failed pregnancies, having an empowerment protocol to guide, support and educate them alongside care would help this injured people to make the right decisions.

## Abbreviation

Not applicable

## Declarations

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### Authors' contributions

Mozghan Zareyee Salehabadi: Writing and initial translation of the article and sampling

Masoomeh Kheirkhah: Writing and final approval of the article and direct supervision of the research process, including supervising the writing of the proposal, educational content

Nazanin Esmaeeli: Psychological counseling on the process of empowering mothers with unsuccessful pregnancies

Shima Haghani: Statistical information analyses

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### Availability of data and materials

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

### Ethics approval and consent to participate

Ethics approval was obtained from the ethics committee in Iran University of Medical Sciences with NO. IR.IUMS.REC.1397.1327, registration of the trial on the TCTR site with the code TCTR20191226001, and obtaining the necessary licenses from Iran University of Medical Sciences.

### Competing interests

"The authors declare that they have no competing interests."

### Consent for publication

Not applicable (we have not included names, images or videos of participants that need obtaining consent).

## References

1. Bhat A, Byatt N. Infertility and perinatal loss: when the bough breaks. Current psychiatry reports. 2016;18(3):31. <https://doi.10.1007/s11920-016-0663-8>
2. Simwaka A, De Kok B, Chilemba W. Women's perceptions of nurse-Midwives' caring behaviours during perinatal loss in Lilongwe, Malawi: an exploratory study. Malawi medical journal. 2014;26(1):8-11.
3. Côté-Arsenault D, Donato KL. Restrained expectations in late pregnancy following loss. Journal of Obstetric, Gynecologic, & Neonatal Nursing. 2007;36(6):550-7. <http://doi.org/10.1111/j.1552-6909.2007.00185.x>.
4. Littlemore J, Turner S. Metaphors in communication about pregnancy loss. Metaphor Soc World. 2019. <https://doi.org/10.1075/msw.18030.lit>
5. Yang L, McCall B. World education finance policies and higher education access: A statistical analysis of World Development Indicators for 86 countries. International Journal of Educational Development. 2014;35:25-36. <https://doi.org/10.1016/j.ijedudev.2012.11.002>
6. Rastegari A, Baneshi MR, Haji-Maghsoudi S, Nakhaee N, Eslami M, Malekafzali H, et al. Estimating the annual incidence of abortions in Iran applying a network scale-up approach. Iranian Red Crescent Medical Journal. 2014;16(10). <http://doi: 10.5812/ircmj.15765>
7. Bardos J, Hercz D, Friedenthal J, Missmer SA, Williams Z. A national survey on public perceptions of miscarriage. Obstetrics and gynecology. 2015;125(6):1313. <http://doi: 10.1097/AOG.0000000000000859>
8. Moore T, Parrish H, Black BP. Interconception care for couples after perinatal loss: a comprehensive review of the literature. The Journal of perinatal & neonatal nursing. 2011;25(1):44-51. <http://doi:>

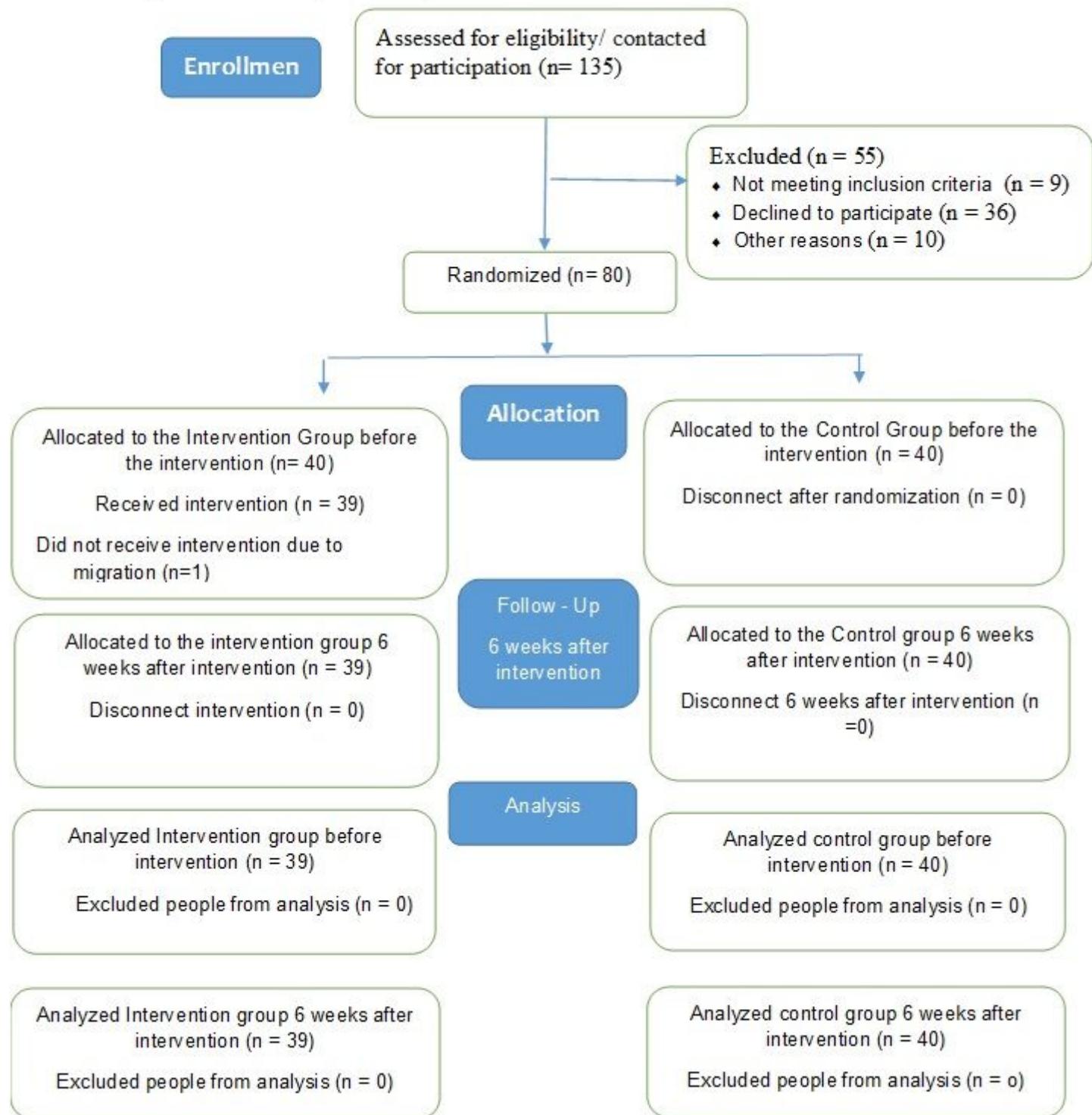
**10.1097/JPN.0b013e3182071a08**

9. Lee L, McKenzie-McHarg K, Horsch A. Women's decision making and experience of subsequent pregnancy following stillbirth. *Journal of midwifery & women's health*. 2013;58(4):431-9.  
<https://doi.org/10.1111/jmwh.12011>
10. Burden C, Bradley S, Storey C, Ellis A, Heazell AE, Downe S, et al. From grief, guilt pain and stigma to hope and pride—a systematic review and meta-analysis of mixed-method research of the psychosocial impact of stillbirth. *BMC pregnancy and childbirth*. 2016;16(1):9.  
<https://doi.org/10.1186/s12884-016-0800-8>
11. Baghdari N, Sahebzad ES, Kheirkhah M, Azmoude E. The effects of pregnancy-adaptation training on maternal-fetal attachment and adaptation in pregnant women with a history of baby loss. *Nursing and midwifery studies*. 2016;5(2). <http://doi: 10.17795/nmsjournal28949>
12. Fockler ME, Ladhami NNN, Watson J, Barrett JF, editors. *Pregnancy subsequent to stillbirth: Medical and psychosocial aspects of care*. Seminars in Fetal and Neonatal Medicine; 2017: Elsevier.
13. Graham I, O'Connor A. User Manual-Preparation for Decision Making Scale [modified 2010]. Ottawa Hospital Research Institute. 2016.
14. Stacey D, Légaré F, Lewis K, Barry MJ, Bennett CL, Eden KB, et al. Decision aids for people facing health treatment or screening decisions. *Cochrane database of systematic reviews*. 2017(4).  
<https://doi.org/10.1002/14651858.CD001431.pub5>
15. Gold KJ, Leon I, Chames MC. National survey of obstetrician attitudes about timing the subsequent pregnancy after perinatal death. *American journal of obstetrics and gynecology*. 2010;202(4):357. e1-e6. <https://doi.org/10.1016/j.ajog.2009.11.039>
16. Allahdadian M, Irajpour AR. Educational Interventions Strategy to Promote the Health of Women Experienced Stillbirth. *Journal of Holistic Nursing and Midwifery*. 2019;29(1):1-7.  
<https://doi.org/10.29252/HNMJ.29.1.259>
17. Wojcieszek AM, Boyle FM, Belizán JM, Cassidy J, Cassidy P, Erwich J, et al. Care in subsequent pregnancies following stillbirth: an international survey of parents. *BJOG: An International Journal of Obstetrics & Gynaecology*. 2018;125(2):193-201. <https://vimeo.com/rcog/authorinsights14424>
18. Khezri R, Ravanipour M, Jahanpour F, Barekat M, Hosseini S. Empowerment in the self-management of hypertension: challenges from the perspective of Iranian elderly patients. *Journal of Research and Health*. 2017;7(1):603-13. <http://DOI: 10.18869/acadpub.jrh.7.1.603>
19. Baljani E, Salimi S, Rahimi J, Amanpour E, Parkhashjou M, Sharifnejad A, et al. The effect of education on promoting self efficacy in patients with cardiovascular disease. *Journal of Kermanshah University of Medical Sciences (J Kermanshah Univ Med Sci)*. 2012;16(3):227-35.
20. Sahebzamani M, Fesharaki M, Abdollahi Mofrad Z. Association of life style and self-esteem among adolescent girls of daily public high schools of Tehran. *Medical Science Journal of Islamic Azad University-Tehran Medical Branch*. 2010;20(1):45-51.
21. Roshan SN, Navipor H, Alhani F. The effect of family centered empowerment model on quality of life in adolescent girls with iron deficiency anemia. *Yafteh*. 2015;16(4):88-99.

22. O'connor A. User Manual—Decisional Conflict Scale. 1993 [updated 2010].Ottawa: Ottawa Hospital Research Institute. 2014.
23. Ghiyasvandian S, Dehghan Nayeri N, Haghani H. The Effect of Decision Aid's Pakage in Selected Treatment by Patients with Early Stage Breast Cancer and Decision making Outcomes.Journal of Fasa University of Medical Sciences. 2013;3(3):271-9.
24. Moudi Z, Phanodi Z, Ansari H, Zohour MM. Decisional conflict and regret: shared decision-making about pregnancy affected by β-thalassemia major in Southeast of Iran.Journal of human genetics. 2018;63(3):309. <https://doi.org/10.1038/s10038-017-0379-6>
25. Envelope S. Randomisation and online databases for clinical trials.URL: <https://wwwsealedenvelope.com/>[accessed 2019-03-08][WebCite Cache ID 76iYrkrIW]. 2019.
26. Meade T, Dowswell E, Manolios N, Sharpe L. The motherhood choices decision aid for women with rheumatoid arthritis increases knowledge and reduces decisional conflict: a randomized controlled trial.BMC musculoskeletal disorders. 2015;16(1):260. <https://doi.org/10.1186/s12891-015-0713-0>
27. Carlson LM, Harris S, Hardisty EE, Hocutt G, Vargo D, Campbell E, et al. Use of a novel computerized decision aid for aneuploidy screening: a randomized controlled trial.Genetics in Medicine. 2019;21(4):923. <http://doi: 10.1038/s41436-018-0283-2>
28. Clark Jr M. Community health nursing. Upper Saddle River.Community Health Nurses of Canada 15th ed Toronto: Community Health Nurses of Canada. 2011.
29. Ferreira C, Marques RC, Nicola P. On evaluating health centers groups in Lisbon and Tagus Valley: efficiency, equity and quality.BMC health services research. 2013;13(1):529. <https://doi.org/10.1186/1472-6963-13-529>
30. Amirabadi T, Nasiri A, Kazemi T, Kardan M. Educational needs of patients with heart valve replacement surgery in birjand, 2012. 2014;2(2):52-8.
31. Vahedian-Azimi A, Alhani F, Goharimogaddam K, Madani S, Naderi A, Hajiesmaeli M. Effect of family-centered empowerment model on the quality of life in patients with myocardial infarction: A clinical trial study.Journal of Nursing Education. 2015;4(1):8-22.
32. Seyed Nematollah Roshan F, Navipor H, Alhani F. Effect of Family-Centered Empowerment Model (FCEM) on quality of life of mothers having teenagers with iron deficiency anemia.Journal of Nursing Education. 2014;3(2):27-40.
33. Alhani F. Design and evaluation of family-centered empowerment model to prevent iron deficiency anemia.Tehran: Tarbiat modarres University. 2003.
34. Alhani F, Sh N, Kimiagar M, Kazemnezhad A, Heidarnia A. Designing of family based empowering model and evaluation of its effect on prevention of iron deficiency anemia in teenager girls.Pejouhandeh Journal. 2003;8(4):283-9.
35. Kheirkhah M, Vahedi M, Jenani P. The effect of group counseling on infertility adjustment of infertile women in Tabriz al-Zahra clinic.The Iranian Journal of Obstetrics, Gynecology and Infertility. 2014;17(113):7-14.

# Figures

**Figure 1:** The Study Flow Diagram



**Figure 1**

The Study Flow Diagram