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# The impact of education on attachment skills in the promotion of happiness among women with unplanned pregnancy

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## Abstract:

**BACKGROUND:** Happiness is among the factors that promote mental health in mothers with unplanned pregnancy. The present study aimed to determine the impact of attachment skills training on happiness among women with unplanned pregnancy.

**MATERIALS AND METHODS:** This clinical trial was conducted on 84 women with unplanned pregnancy referred to three prenatal clinics in Shiraz in 2018. The participants were randomly divided into an intervention group and a control group using permutation block. At first, the participants were requested to sign written informed consent form, demographic information form, and mental health questionnaire. Then, they were asked to complete Oxford Happiness Questionnaire and Cranley's Maternal-Fetal Attachment Scale. The intervention group received attachment training through six 90-min sessions, while the control group underwent the hospital's routine care. The two groups were required to fill out the study questionnaires once more after 4 weeks after the intervention. After all, the data were analyzed using Chi-square test, Fisher's exact test, independent *t*-test, and ANOVA.

**RESULTS:** There was a significant difference between the two groups' pretest and posttest mean scores of happiness ( $P = 0.0001$ ). The results showed that in the experimental group, pretraining and posttraining period mean scores were 89.64 (7.2) and 93.13 (6.09), respectively; while in the control group, pretraining and posttraining period mean scores were, respectively, 91.69 (9.96) and 91 (8.82). The difference between the two groups was statistically significant. No significant relationship was observed between happiness and the couples' occupations, number of pregnancies, and number of miscarriages in the two groups ( $P > 0.05$ ).

**CONCLUSION:** The mean score of happiness increased after the training, being significantly different from that in the control group. Therefore, happiness is a changeable feature that can be promoted among pregnant women via interventional methods.

## Keywords:

Attachment, fetal, happiness, maternal, training, unplanned pregnancy

## Introduction

Pregnancy is considered to be a crisis in humans' life cycle as well as a turning point in physical, mental, and social dimensions.<sup>[1]</sup> Unplanned pregnancy refers to a pregnancy that occurs in unexpected or inappropriate times and is one of the main indices of reproductive health.<sup>[2,3]</sup> In fact,

unplanned pregnancy and its complications comprise a global issue, which involves women, families, and societies.<sup>[4]</sup> Such women are more prone to cigarette smoking, alcohol consumption, drug abuse, X-ray, low consumption of folic acid, maternal and fetal death, miscarriage, low birth weight, and preterm delivery.<sup>[5-7]</sup> The rate of unplanned pregnancy differs in various parts of the world. Global research has indicated that

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40% of all 85 million pregnancies were unplanned in 2012.<sup>[8]</sup> In another study performed in Brazil in 2012, 55.4% of the women reported that their pregnancies were unplanned after delivery.<sup>[9]</sup> One previous study also revealed that almost half of the pregnancies occurred in the US in 2016 were unplanned.<sup>[10]</sup> In Another study showed. The unwanted pregnancy rate in sub-Saharan Africa is between 40-40%. Unintended pregnancy can lead to increased maternal and infant mortality.<sup>[11]</sup> In Iran, the results of a study carried out in 2012 showed that 27.94% of pregnancies were unplanned.<sup>[12]</sup>

Unplanned pregnancy may result in an inappropriate relationship between the mother and her child.<sup>[6]</sup> Maternal attachment begins to develop before delivery.<sup>[13]</sup> In other words, attachment starts when the mother becomes aware of her pregnancy, which is the starting point for the relationship between the fetus and its surrounding world.<sup>[14]</sup> Attachment during pregnancy manifests through various behaviors, including talking to the fetus and caressing the fetus and the abdomen.<sup>[15]</sup> A strong attachment between the mother and her fetus is accompanied by positive health outcomes during pregnancy.<sup>[16]</sup> Mother-to-child transplantation, feelings of intimacy, affection, protection, and concern for the health of the child are reflected in maternal behaviors of the fetus, including watching, smiling, touching, and talking to the child.<sup>[17]</sup> Blaine *et al.* (2007) concluded that prenatal training has a positive effect on prenatal attachment.<sup>[18]</sup> Mothers undergoing educational interventions may develop more maternal behaviors that, in turn, may affect maternal health.<sup>[19]</sup> On the other hand, a weak attachment results in irrecoverable consequences, such as anxiety or symptoms of postpartum depression. Women with weak attachment also show more symptoms of depression toward their children's early growth delay after birth.<sup>[20]</sup> Furthermore, the children whose parents have weak attachments experience lower mental reformations, weak social relations, school violence, aggressive behaviors, and hyperactivity.<sup>[21]</sup>

Research conducted on attachment among vulnerable groups has indicated that stressors might increase the risk of unsafe attachment among individuals.<sup>[20]</sup> Based on the positive psychology perspective, negative psychological experiences during pregnancy may be justified by the experience of happiness. This implies that the experience of happiness can block the way against negative experiences.<sup>[22]</sup> Happiness is among the factors of mental health and one of the six major emotions among human beings.<sup>[23]</sup> These six emotions include anger, fear, disgust, wonder, grief, and happiness. One study has analyzed that happiness involves several essential components, the emotional component that makes a person happy. The social component, where the happy person has good social relationships with

others and can receive social support, and eventually the cognitive component, which enables the happy person to process, interpret, and interpret information in a specific way. In the end, it makes him feel happy and optimistic.<sup>[24]</sup> Therefore, attachment styles, as a change factor, play a critical role in the formation of psycho-emotional constructs, particularly happiness.<sup>[25]</sup>

Lack of happiness can lead to negative experiences and low quality of pregnancy. It may also reduce maternal-fetal attachment through its impact on the mother's feeling of worthiness. Such negative experiences present as irritability and anxiety, which can have detrimental effects on both the mother and her fetus through inappropriate reactions to pregnancy and the resultant stresses.<sup>[26,27]</sup> Considering the role of happiness in pregnancy and lack of interventional studies in this context, the present study aims to evaluate the effects of maternal-fetal attachment training on the mother's happiness so as to empower the mothers to cope with stress.

## Materials and Methods

This clinical trial was conducted on 84 pregnant women with unplanned pregnancy who had referred to prenatal clinics (Hafez, Shoushtari, and Hazrat-e-Zeinab) in Shiraz in 2018. Considering the previous studies,<sup>[28]</sup> we estimated the sample size, using the following formula:

$$n_1 = n_2 = \frac{\left( z_{1-\frac{\alpha}{2}} + z_{1-\beta} \right)^2 (s_1^2 + s_2^2)}{d^2} \quad d = \mu_1 - \mu_2$$

$$n_1 = n_2 = \frac{\left( z_{1-\frac{0.05}{2}} + z_{1-0.2} \right)^2 (4.2^2 + 4.9^2)}{d^2} \quad d = 44.3 - 47.4$$

Accordingly, a 70-subject sample size was determined for the study ( $n = 35$  in each group). Yet, considering the 20% probability of loss, the sample size was increased to 84 participants. The study participants were selected from the eligible individuals referred to the three above-mentioned centers using convenience sampling. Then, they were allocated to the intervention or control groups using permuted block randomization. The permuted block design involves randomizing the mothers in treatment and control groups in sequential blocks. In this method, a and b represented the participants in the intervention and control groups, respectively. In a design where the block size is four, there are six possible ways to make treatment assignments for a block: aabb, bbaa, abab, baba, abba, and baab. Thus, 21 blocks with

the block size of four were randomly divided into the intervention and control groups [Figure 1].

The inclusion criteria of the study were women having unplanned pregnancy; women not suffering from mental disorders (psychosis and schizophrenia) through interviews with them, the mother's medical record, self-report, and through the General Health Questionnaire; women being able to take part in training sessions, women completing the written informed consent form for participating in the research, women obtaining a score below 22 in Goldberg's Mental Health Scale, and women not having taken part in any other training courses including those on physiological delivery. The exclusion criteria of the study were lack of willingness to cooperate, incidence of pregnancy problems during the study (preterm labor, placental abruption, etc.), and irregular participation in the training sessions (for more than two sessions).

The study data were collected using a demographic information form, Cranley's Maternal-Fetal Attachment Scale, General Health Scale, and Oxford Happiness Questionnaire. The demographic information form included the mothers' demographic characteristics and pregnancy information.

Oxford Happiness Questionnaire was developed by Arjil Velo in 1989 and contained 29 items. The items could be responded via a four-point Likert scale with the

following options: always (4), often (3), rarely (2), and never (1). The maximum score of the questionnaire was 116, with higher scores representing higher happiness levels. The psychometric properties of this questionnaire were assessed by Alipour and Nourbala (2008). Indeed, its reliability was confirmed using Cronbach's alpha = 0.93.<sup>[29]</sup>

Cranley's Maternal-Fetal Attachment Scale assessed the mother's behavior toward her fetus in five dimensions: 1 – acceptance of maternal role, 2 – mutual relationship with the fetus, 3 – attributing features to the fetus, 4 – differentiating between oneself and the fetus, and 5 – self-sacrifice. Each item could receive a score between one and three (3 [yes], 2 [I do not know], and 1 [no]). Thus, the minimum and maximum scores of the scale were 24 and 72, respectively. It should be noted that the means and standard deviations of the behaviors were computed. This scale was developed by Cranley, and its reliability and validity were determined. In Iran, this scale was translated by Khorramroudi and its validity was approved via content validity method. Besides, its reliability was assessed via the test-retest method and confirmed with  $r = 0.85$ .<sup>[30]</sup>

General Health Questionnaire was designed by Goldberg and Hiler in 1972. The score of this questionnaire could range from 0 to 84, with lower scores representing better general health status. In Iran, Cronbach's alpha coefficient was reported to be 88% for the whole scale and 66%–85% for its subscales.<sup>[31-33]</sup>

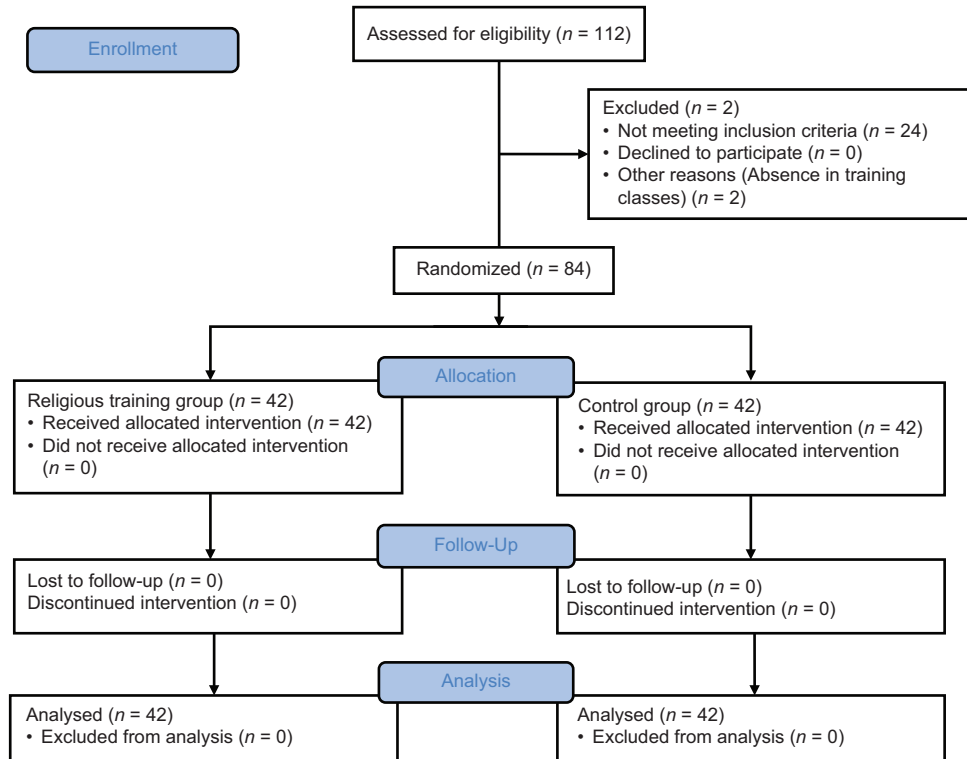


Figure 1: Consort of sampling

### Intervention method

Sampling was started after obtaining a referral letter from Hazrat-e-Fatemeh School of Nursing and Midwifery, Shiraz, and gaining permission from the authorities of the selected hospitals. At first, the researcher referred to the selected centers on a daily basis to choose 84 women with unplanned pregnancy who obtained a mental health score below 22. The individuals who met the inclusion criteria were asked to complete written informed consent form for taking part in the research as well as the demographic information form.

The mothers in the intervention group were divided into three groups each containing 15 members. The training classes were held for each group in the form of six 90-min sessions. The participants were evaluated in each session. Cranley’s Maternal-Fetal Attachment Scale and Oxford Happiness Questionnaire were completed before and after the intervention. The educational contents are briefly presented in Table 1. Education and counseling on attachment behaviors in addition to the sessions are listed in Table 1; the focus was on talking to the mother of the fetus, touching the fetus through the abdomen, paying attention to the fetal movements, drawing the fetal image, and imagining embracing and breastfeeding the baby; at each session, a number of mothers performed role playing in class.

The control group participants received the hospital’s routine care. Similar to the intervention group participants, they were evaluated with respect to attachment, happiness, and general health at baseline, 4 weeks after the training, and at the end of 38 weeks of gestation.

### Ethical considerations

This research project was approved by the Local Ethics Committee of Shiraz University of Medical Sciences (IR.SUMS.REC.1397.100), and written informed consent was obtained from all the participants. After obtaining the patients’ agreement to participate, the

researchers introduced themselves to the participants. Examiners explained the trial’s objectives and assured the participants that their information would be kept confidential and no names would be mentioned. Then, necessary explanations were provided concerning the trial. Afterward, all the participants filled out informed consent form before their attendance in the study; the research proposal was financially supported by Endocrine and Metabolism Research Center, Shiraz University of Medical Sciences. The research in the Iranian Registry of Clinical Trial was registered with the number of IRCT20130710013940N5.

### Statistical analysis

After all, the data were entered into the SPSS software, version 21, (IBM United States Software Announcement) and analyzed, using descriptive statistics, mean, standard deviation, maximum, minimum, percentage, and abundance indices. To answer the research hypotheses, we used inferential statistics tests (Kolmogorov–Smirnov test, Levin test, covariance analysis test, and paired *t*-test).

## Results

The mean age of the mothers was  $29.17 \pm 6.1$  years in the control group and  $29.49 \pm 4.28$  years in the intervention group. The mothers’ mean age at marriage was  $23.31 \pm 4.84$  years in the control group and  $22.41 \pm 5.16$  years in the intervention group. Besides, their mean age at the first pregnancy was  $23.08 \pm 5.33$  years in the control group and  $23.34 \pm 5.32$  years in the intervention group. Most of the participants in both study groups had diplomas and were homemakers [Tables 2 and 3].

Of the mothers, 26 (31%) had an education lower than a diploma, 40 (47.6%) had a diploma, 13 (15.5%) had a bachelor’s degree, and 3 (3.6%) had a master’s degree. No one answered. Of the wives, 26 (31%) were married with less than a diploma, 37 (44%) with a diploma, 9 (10.7%) with a bachelor’s degree, and 4 (8.4%) with a master’s or doctorate degree. Eight people did not respond.

**Table 1: The educational contents of the training sessions**

Educational session	Educational content	Required educational aids
1	Familiarity with anatomical, physiological, and hormonal changes during pregnancy, familiarity with fetal growth and development, consultation about pregnancy risk factors and strategies to deal with them	Whiteboard, marker, computer, picture, poster, pamphlet, educational movie
2	Strategies for more conformity with the changes occurred during the pregnancy period, practicing attachment behaviors	
3	Practicing attachment behaviors, including caressing the abdomen, talking to the fetus, and paying attention to fetal movements, training with regard to exclusive breastfeeding and hugging the infant	
4	The effects of anxiety on the mother, familiarity with the process and stages of delivery	
5	The effects of happiness on the mother and the fetus, training the mothers regarding how to maintain their physical and mental health during and after pregnancy, practicing attachment behaviors	
6	Reviewing the previous sessions through role play, question and answer	

**Table 2: Descriptive indicators of fertility characteristics in the subjects under the study**

Variable	Experimental group			Control group		
	Minimum	Maximum	Average±SD	Minimum	Maximum	Average±SD
Mother's age	19	37	29.49±4.28	19	37	29.49±4.28
Marriage age	16	36	22.41±5.16	16	36	22.41±5.16
Age of first pregnancy	15	37	23.34±5.32	15	37	23.34±5.32
Mother's age	19	40	29.17±6.1	19	40	29.17±6.1
Marriage age	16	32	23.31±4.84	16	32	23.31±4.84
Age of first pregnancy	13	35	23.08±5.33	13	35	23.08±5.33

SD=Standard deviation

**Table 3: Frequency distribution of demographic characteristics of the sample group**

Variable	Experimental group				Control group			
	Unit of measurement	Minimum	Maximum	Average±SD	Unit of measurement	Minimum	Maximum	Average±SD
Mother's age	Year	19	637	29.49±4.28	Year	19	40	29.17±6.1
Marriage age	Year	16	36	22.41±5.16	Year	16	32	23.31±4.84
Age of first pregnancy	Year	15	37	23.34±5.32	Year	13	35	29.17±5.33

SD=Standard deviation

The intervention group's mean score of happiness increased significantly after the intervention compared to the control group. Descriptive statistics of happiness and maternal-fetal attachment scores before and after the intervention have been tabulated. Accordingly, a significant difference was observed between the two groups' before and after the intervention ( $P = 0.0001$ ) [Tables 4 and 5].

The results revealed no significant relationship between happiness and the couples' age and occupation in both intervention and control groups. The results also showed no significant relationship between happiness and the husband's education level in the intervention group. However, a significant negative relationship was observed between happiness and husband's education level in the control group. Accordingly, higher education levels were accompanied with lower happiness levels. The results demonstrated no significant association between happiness and number of pregnancies and miscarriages in the two study groups [Table 6].

## Discussion

The study results indicated that the mean score of happiness increased after the intervention compared to the baseline, and the difference was statistically significant. In the same vein, Jazayeri *et al* (2018) revealed that safe attachment was positively correlated to happiness and negatively associated with avoid and ambivalent styles. Therefore, attachment styles seem to be effective in happiness.<sup>[34]</sup>

Blake *et al.* investigated the relationship between the intention-to-get pregnant and happiness as well as infants' health outcomes among Black women with high-risk pregnancy. The results indicated that the intention-to-get

**Table 4: Mean score of happiness of mother and fetus before and after training in the experimental and control groups**

Group	Variable	Experimental group	Mean±SD	Standard error of the mean
Experimental	Happiness	Before training	89.64±7.20	1.11
		After training	93.12±6.09	0.94
Control		Before training	91.69±9.96	1.54
		After training	89.00±8.82	1.36

SD=Standard deviation

pregnant was highly associated with happiness and that happiness could predict the amount of risk. Accordingly, unhappy women had higher hazards of cigarette smoking, depression, domestic violence, alcohol abuse, and drug abuse compared to happy ones. Moreover, the odds of happiness were lower (0.3–0.6) among the women who had another child or had a child below 2 years old, were single, or had more than one sexual partner during the past year, as well as among those whose husbands had not accepted their pregnancies.<sup>[35]</sup>

Nelson and O'Brien conducted a prospective study to explore the impact of unplanned pregnancy on the mother and her relationship with her child over 15 years. The results indicated that the parents with unplanned pregnancy created a negative atmosphere under certain circumstances, which could affect the mother as well as the child in the long run.<sup>[36]</sup>

Blake's (2007) study showed that there is a close relationship between pregnancy intention and happiness in high-risk pregnant black women and the level of happiness predicts the amount of risk. Women with lower happiness are more likely than women to be happy with smoking, depression, partner violence, drinking, and drug use.<sup>[35]</sup>

**Table 5: Paired t-test for mother and fetus happiness and attachment scores before and after training in the experimental and control groups**

Group	Variable	t-statistics	Degrees of freedom	Significance level (P)	Difference between averages	95% CI	
						Lower limit	Upper line
Experimental	Happiness	-4.264	41	0.001	-3.47619	-5.12261	-1.82977
Control		2.115	41	0.041	2.69048	0.12125	5.25970

CI=Confidence interval

**Table 6: Value of happiness correlation with variables of age, education, occupation (mother and spouse), and fertility characteristics**

Happiness with	Control group			Experimental group (intervention)		
	Correlation	n	Significance level	Correlation	n	Significance level
Mother's age	0.121	42	0.449	0.161	42	0.313
Maternal education	-0.297	42	0.059	0.007	42	0.963
Employment status of mothers	0.181	42	0.251	0.163	42	0.302
Age of wife	0.190	42	0.243	0.125	42	0.452
Education level of spouse	-0.33	42	0.049	0.065	42	0.691
Employment status of spouse	0.025	42	0.878	0.119	42	0.454
Number of pregnancies	0.099	42	0.545	0.213	42	0.181
Number of abortions	-0.22	42	0.366	0.188	42	0.233

Pregnancy is a critical period for women. Hence, providing the mothers, particularly high-risk ones, with the necessary trainings can be of utmost importance.<sup>[37]</sup> This issue should be taken into consideration, specifically in unplanned pregnancies where the mothers' physical and psychological health is affected.

The results of the current study indicated that the women's occupation and education level were not effective in the score of happiness. In contrast, a prior study showed that elderly individuals were highly or relatively happy and that their happiness level increased with age.<sup>[38]</sup>

Emotional ideas, such as happiness and attitude toward life, are a key factor for the elimination of stress and anxiety associated with life events.<sup>[39]</sup> Happiness is among the positive emotions and most experts believe that happiness should be considered as a basic target in education. In a study also reported a close relationship between happiness and education.<sup>[40]</sup> Indeed, studies conducted on happiness have indicated that being happy can be learned and that individuals' happiness can be increased permanently.<sup>[41]</sup> Therefore, cognitive and motivational processes, such as attachment training, should be enhanced to create happiness among individuals. In the present study also, attachment skills training was employed to increase the happiness level.

The quality of attachment has a direct effect on the mother's and her fetus' health. A large number of attachment behaviors may lead to attachment before delivery. These behaviors include caressing different parts of the fetus, counting the movements of the fetus, training the eligible parents regarding child care, and talking to the fetus.<sup>[42]</sup> Moreover, attachment styles are

effective in psychological constructs, including quality of life and happiness.<sup>[43,44]</sup>

The more time the individuals spend for experiencing positive emotions, the less their negative emotions will be. Since pregnancy is an unfamiliar experience, giving meaning to this period and considering it to be important can support pregnant women and relax them while coping with this unfamiliar experience.<sup>[45]</sup> In the present study, attachment skills training increased the intervention group's happiness level as well as general health after 8 weeks. This can result from the fact that individuals with high happiness levels make use of stress coping strategies, which reduces their negative thoughts that provide the ground for mood disorders and anxiety. These individuals are also less probable to develop psychological distresses.

Generally, human life is full of complexities and positive and negative outcomes. To cope with negative outcomes such as depression and stress, happiness should be promoted in the society. Since happiness is a changeable feature, its level can be promoted by means of educational intervention methods. Maternal-fetal attachment training is one way to create positive emotions, which can affect the mother's thoughts and enhance her happiness level. With regard to the impact of attachment skills training on increasing the happiness level, health specialists are recommended to pay due attention to this technique. By helping the clients to use this technique, they would be able to prevent the decline in happiness resulting from negative thoughts. At the end, the question might be what is the argument to show that this course was simply intended to make a difference in the two groups studied and that no other factors were involved.

In response, it can be stated that research has shown that to reduce maternal stress, the focus on daily activities and problems must be changed. Thinking about the fetus and engaging in attachment behaviors such as talking and touching the fetus can provide conditions that can cause comfort and happiness in the mother. Daily repetition of these behaviors will stop unwanted thoughts and reduce sympathetic nervous system activity and anxiety.<sup>[34]</sup>

Pregnant women's behavior affects their as well as their children's health, which may be due to their attitude toward pregnancy. In a study conducted by Couste, it was found that the behavior of women with planned pregnancies was different from that of women with unwanted pregnancies. They pay more attention to pregnancy symptoms and prenatal care.<sup>[46]</sup> In the present study, we made an attempt to change the attitude of women with unplanned pregnancy toward pregnancy and fetus and to take a step toward developing positive behaviors. In another study, educational interventions reduced the anxiety of mothers with unwanted pregnancies and increased the level of peace and happiness.<sup>[47]</sup>

One of the strengths of the study was the study of women with unplanned pregnancies, and since this group of mothers is considered as the high-risk mothers, a clear change in their behavior was observed at the end of the training sessions. Mothers can partially improve their mental health problems and their relationship with the fetus. One of the weaknesses in the implementation of the project was the lack of training facilities in hospitals in different areas of the city. Furthermore, the efficacy of our research results can be confirmed by comparing the findings in the two groups of wanted and unwanted pregnancies.

## Conclusion

The mean score of maternal happiness before and after attachment training was compared in the experimental and control groups. Findings from the happiness score showed that there is a significant difference between the estimated happiness scores of the experimental and control groups. Regarding the effectiveness of attachment behaviors training on happiness among the mothers with unplanned pregnancy, it seems that maternal-fetal attachment training had a significant effect on mental health and happiness among the mothers with unplanned pregnancy. Training attachment and happiness skills is, in fact, one of the main needs of the mothers. Midwives who have close contacts with mothers play a key role in training and providing these services, eliminating the problems, and improving the life quality of the mothers with unplanned pregnancy.

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## Conflicts of interest

There are no conflicts of interest.

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