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Research article

Effects of positive psychology interventions on happiness in women with unintended pregnancy: randomized controlled trial

Zahra Rastad [a], Mohsen Golmohammadian [b], Amir Jalali [c], Bijan Kaboudi [d], Marzieh Kaboudi [e,*]

[a] Students Research Committee, Kermanshah University of Medical Sciences, Kermanshah, Iran
[b] Department of Counseling, Faculty of Social Sciences, Razi University, Kermanshah, Iran
[c] Department of Psychiatric Nursing, School of Nursing and Midwifery, Medical University of Kermanshah, Kermanshah, Iran
[d] Center of Cardiovascular Research, Medical University of Kermanshah, Kermanshah, Iran
[e] Department of Reproductive Health, School of Nursing and Midwifery, Medical University of Kermanshah, Kermanshah, Iran

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ABSTRACT

Background: Undesirable effects Negative feelings among women with unintended pregnancies may have undesirable effects on pregnancy. However, little is known about the effect of positive feelings and protective factors on prenatal mental health of pregnant women. The aim of the present study was to determine the effect of positive psychology-based interventions (PPI) on the happiness of women with unintended pregnancies.

Methods: This randomized controlled trial that included 40 women with unintended pregnancies was conducted between March and July 2017. The subjects were randomly assigned to receive 10 weekly training sessions based on positive psychology (PPI) (N = 20) or routine prenatal care (N = 20). All subjects received usual prenatal care. The level of happiness and its five domains were measured in three time points: at baseline, immediately after completing the intervention, and 45 days after the end of the intervention. The happiness was assessed using the Oxford Happiness Inventory (OHI).

Results: In the intervention group, the mean total OHI score increased from 31.3 (at baseline) to 42.5 (after completing ten sessions of PPI), and the increase remained statistically significant at a 45-day follow-up (39.8); P = 0.001. However, the total OHI score did not change significantly during the follow-up (P = 0.339). Satisfaction with life, self-esteem, and subjective well-being improved significantly after the interventions, whereas the increases observed in the scores of positive mood and self-efficacy dimensions were not significant.

Conclusion: PPIs can improve happiness and its dimensions among women with unintended pregnancies. It is suggested that healthcare planners help women with unplanned pregnancies adapt by formulating strategies to hold training courses with a positive psychology approach and recognize and promote their positive aspects and strengths.

1. Introduction

Pregnancy is considered a transitional stage to accept a new role and responsibility for women that requires psychological preparation [1, 2, 3]. However, facing an unplanned/unintended pregnancy and refusing to accept it can lead to unpleasant consequences during pregnancy [4, 5]. In other words, the nature of unintended pregnancy may impact the adaptation to the pregnancy [6]. Worldwide, it is estimated that 44% of pregnancies are unintended [7].

Thus, unintended pregnancy is considered a major issue threatening the reproductive health of women and imposing an appreciable socio-economic burden on individual and society [8]. Women with unintended pregnancies show significant differences in healthy behaviors [4]. Women with unintended pregnancy have been shown to be more exposed to suicide and depression [6], poor nutrition during gestation [9], mental health issues, having low birth weight infants, and delayed onset of prenatal care [8, 10].

One of the actions of women with unintended pregnancies is to perform illegal and unsafe abortions [8, 11]. Psychological issues have been reported as a reason that why women with unintended pregnancies did not decide for doing an abortion when initiating early prenatal care [12].

Undesirable effects of negative feelings among women during their pregnancies have been studied [13, 14, 15]. However, few evidence

* Corresponding author.
E-mail address: fkaboudi@kums.ac.ir (M. Kaboudi).

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exists regarding the effect of positive feelings and protective factors on the prenatal mental health [16, 17].

Studies have shown that the mother's emotional response to pregnancy and her level of happiness has very significant effects on her decision to continue the pregnancy and adopt healthy behaviors [18, 19, 20]. A strong relationship has been reported between the level of happiness and the onset of prenatal care and pregnancy outcomes such as low birth weight and infant death [21]. Limited evidence exists about the effectiveness of psychological interventions for mothers with an unplanned pregnancy. Perceived social support, for example, has been implicated in a former study to be more common in women with stress towards their pregnancy [22].

Considering the benefits of having a happy life for people, especially pregnant women [21], psychologists and researchers have attempted to develop approaches to increase happiness in people's lives [23] to change their cognitive and emotional structures and provide a more positive and adaptive attitude towards life events [24]. One of these approaches is positive psychology, which suggests three paths to a pleasurable, meaningful, and engaging life to achieve happiness [18, 19, 20, 25, 26]. This approach reduces mental disorders and has a positive effect on happiness by developing planned activities to promote positive emotions, cognitions, and behaviors [27, 28].

Unintended pregnancy is one of the important issues in reproductive health that may adversely affect the happiness of women. Unintended pregnancy has been associated with depression in women, and these women may experience disappointment and stress during pregnancy [29]. Therefore, studying psychological methods to improve happiness in such populations can be promising. The aim of the present study was to determine the effect of positive psychology-based interventions (PPI) on the happiness of women with unintended pregnancy. As such, we hereby examined the hypothesis that a brief period of positive psychology intervention (PPI) may increase the happiness of women with an unintended pregnancy.

2. Methods

2.1. Design and participants

This research was designed as a randomized controlled trial. Among patients seeking care from health centers of the Kermanshah city, Iran, between March and April 2017, we consecutively recruited 40 married women with an unintended pregnancy. Pregnancy was defined as unintended if it was "unwanted" in which the couple had no desire to have children or a "mistimed" pregnancy in which pregnancy occurred earlier than the time the couple desired. Exclusion criteria were gestational age >20 weeks, a past medical history of infertility or any organic or psychiatric disorder, vaginal bleeding, and history of illicit drug addiction by pregnant women or their husbands. Additionally, those who missed more than 2 sessions of the interventions, lost to follow-up, or the pregnancy terminated before the interventions were completed were not included in the final analyses.

2.2. Randomization

Participants were randomly assigned to two groups of intervention (N = 20) and control (N = 20). Random allocation was carried out using a simple randomization method in such a way that letters A and B were written on separate pieces of paper 20 times and then placed in a container. Participants were asked to remove a piece of paper from the container. Selected papers were not returned to the container. The selected letters A and B were assigned to the intervention and control groups, respectively. In order to avoid possible bias at all stages, the questionnaires were distributed and collected by a person other than the researcher team members.

2.3. Measurements

Demographic and reproductive data were obtained from all participants. These included age, employment status, level of formal education, gestational age, number of children, Kind of unintended pregnancy (unwanted/unplanned), husband's intention to the pregnancy, the interval between the two recent pregnancies, and contraception method(s).

Happiness was measured using the 29-item Oxford Happiness Inventory (OHI). There are five dimensions to happiness, including "satisfaction with life", "self-esteem", "self-efficacy", "subjective well-being", and "positive mood" [30]. This inventory consists of four-choice items scored as follows: A: 0, B: 1, C: 2, and D: 3. Thus, the possible total score range is 0–87, with higher scores indicating a greater level of happiness. The normal score for this inventory is between 40 and 42 [31]. Information about internal consistency, reliability, and construct validity of the Persian translation of the instrument has been provided by Liaghatdar et al. [32]. The OHI has been studied previously in several studies enrolling the Iranian populations, such as healthcare students [33] and nurses [34].

2.4. Interventions

In addition to routine prenatal care, the intervention group underwent PPI for ten sessions (one session per week for 70–90 min) in healthcare centers. The women in the intervention group were divided into four groups (10 participants in each group). During the sessions, PPIs were taught to the participants. Since positive psychology sessions are task-oriented, participants were presented with a set of tasks in each session. The content of the sessions included procedures to solve these tasks (Table 1). The intervention and training were carried out using lectures, group discussions, and questions and answers. To achieve this goal, we used teaching aids, such as video projectors, videos, pamphlets, and book introductions. Finally, the two groups were re-evaluated immediately after the intervention, and the third evaluation (follow-up) was performed after 45 days (Figure 1).

2.5. Statistical analysis

Descriptive indices including frequency (percentage) and mean (standard deviation, SD) were used to report categorical and continuous variables, respectively. The Shapiro-Wilk test was used to test the normal distribution of OHI scores at each measurement (baseline, post-intervention, and on day 45) separately in the studied groups. A repeated measures ANOVA (or Friedman test, as applicable) was used to compare OHI total score and scores of the five dimensions (i.e., satisfaction with life, self-esteem, self-efficacy, subjective well-being, and positive mood) at three measurements in each group separately. To compare OHI scores and its subscale scores at each time point between the two groups (time-by-time analysis), independent samples t test or Mann-Whitney test was used.

2.6. Ethics

The study was conducted according to the principles of the Declaration of Helsinki revised in 2008. The study was approved by the Ethical Committee of Kermanshah University of Medicine Science, Kermanshah, Iran (approval number KUMS.REC.1395.717) and was recorded in the Iranian Registry of Clinical Trials (IRCT2017030714333N70). Written informed consent was provided by all participants.

3. Results

The mean age in the intervention and control groups were respectively 30.1 and 29.8 years. The mean time passed since the last pregnancy

Table 1. Group training package of positive psychology interventions and brief descriptions of each of them.

Sessions	Description
Human strengths and potential	Complete the practical values questionnaire to identify your top 5 capabilities and then think of ways to use them in your daily life.
Counting blessings	Every evening, write down three positive things or three blessings that happened to you during the day and think about the reasons why they occurred.
Savoring and Biography	Suppose you die after a productive and satisfying life. What would you like to be told about as your heritage at your funeral? Write on one to two pages what you would like them to tell about you.
Gratitude visit	Think of someone you owe a lot to (someone who did something for you), but you never had the opportunity to thank him/her properly. Write an appreciation letter to him/her and write the reason for it, and then read the letter to him/her by phone or in person.
Active-Constructive Response	When you respond enthusiastically and positively to the good news that others are giving you, you give an active and constructive response.
Meaning of life	Take time once a day for something you are usually in a hurry to do (such as eating, going to work or class quickly, or taking a shower) and do it less slowly. When the work is done, write down what you did and what was the difference when you did the task slowly from the previous times, and compare your feelings in these two situations.

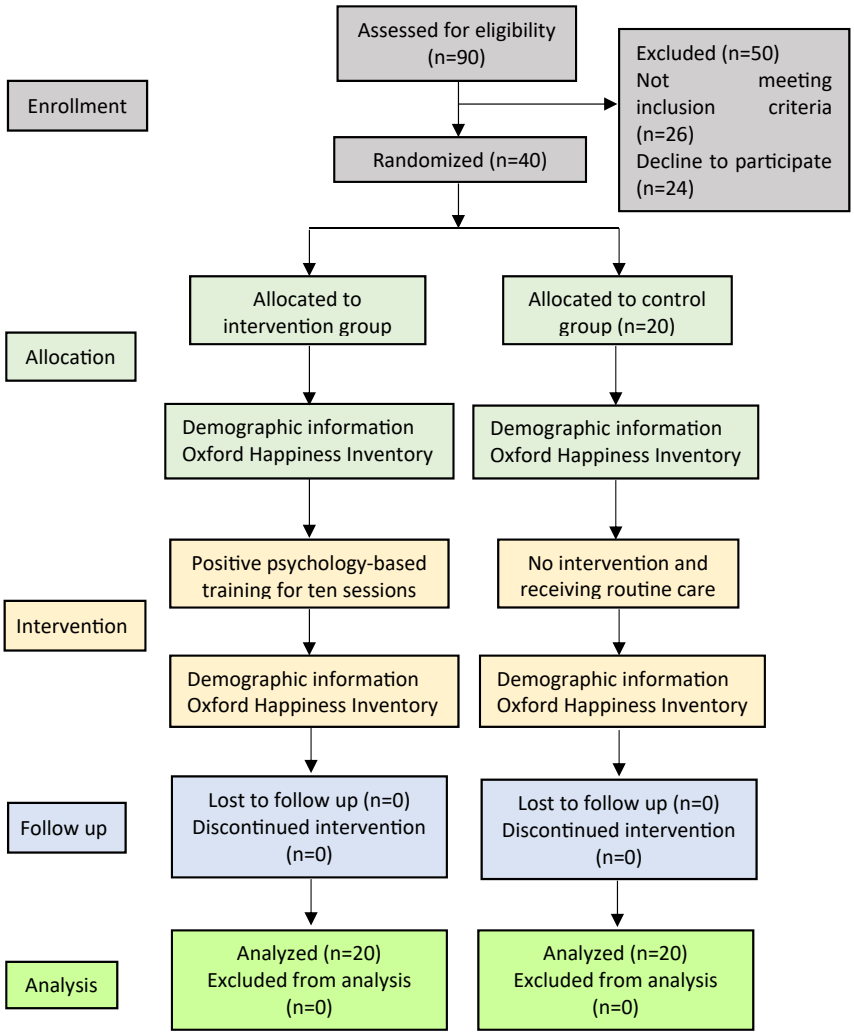

Figure 1. Flow diagram of the study.

was 2.2 years in the intervention group and 2.9 years in the control group. None of the participants were in their first pregnancy. Baseline characteristics of the participants are reported in Table 2. As observed, baseline characteristics are well balanced between the two groups.

As shown in Table 3, the mean total score of OHI as well as its five dimensions did not differ significantly between the two groups. However, immediately after the administration of the PPIs, a significant difference was detected in OHI total score and its five subscales in a way that the scores were higher in the intervention group compared to the control group. This significant difference between the groups continued after 45 days of follow-up of the participants. In the intervention group, the mean total OHI score increased from 31.3 to 42.5, and the increase remained statistically significant at a 45-day follow-up (39.8) in comparison to the baseline.

When we examined dimensions of the OHI, the analyses showed that satisfaction with life ($P = 0.006$), self-esteem ($P = 0.003$), and subjective well-being ($P = 0.02$) improved in the intervention group. On the other hand, the overall difference in self-efficacy was not significant, and

Table 2. Baseline demographic characteristics of two groups of pregnant women with unintended pregnancy.

		Intervention group (N = 20)	Control group (N = 20)	All participants (N = 40)
Occupation	Employee	4 (20%)	6 (30%)	10 (25%)
	Housewife	16 (80%)	14 (70%)	30 (75%)
Education	High school Diploma or lower	15 (75%)	15 (75%)	30 (75%)
	College/university	5 (25%)	5 (25%)	10 (25%)
Number of children	Less than 3	15 (75%)	16 (80%)	31 (78%)
	3 or more	5 (25%)	4 (20%)	9 (23%)
Current unintended pregnancy form	Mistimed	12 (60%)	10 (50%)	22 (55%)
	Unwanted	8 (40%)	10 (50%)	18 (45%)
Desire of husbands to continue pregnancy	Yes	6 (30%)	5 (25%)	11 (28%)
	No	14 (70%)	15 (75%)	29 (73%)
Contraception	Pharmacological methods	8 (40%)	8 (40%)	16 (40%)
	Other methods	12 (40%)	12 (60%)	24 (60%)
Age, year*		30.1 (±8.8)	29.8 (±7.9)	29.9 (±8.3)
Gestational age, week*		14.1 (±3.6)	13.7 (±3.3)	13.9 (±3.4)
Time interval since the previous pregnancy, year*		2.2 (±1.8)	2.9 (±2.9)	2.5 (±2.4)
Monthly income, million Tomans*		1.8 (±0.8)	2.2 (±0.9)	2.0 (±0.9)

* The results are presented as mean (±standard deviation).

Table 3. Mean total score of the Oxford Happiness Inventory and its five subscales in the positive psychotherapy intervention (PPI) and control groups at baseline, immediately following the intervention (post-PPI), and 45 days later.

Variables		Baseline	P value*	Post-PPI	P value*	Day 45	P value*	P value¥
OHI total score	PPI	31.3 (1.47)	0.925	42.5 (1.7)	0.001	39.8 (1.6)	0.001	0.001
	Control	31.7 (1.8)		31.2 (1.6)		30.8 (1.7)		0.339
Satisfaction with life	PPI	0.82 (0.10)	0.643	1.31 (0.07)	0.001	1.18 (0.08)	0.009	0.006
	Control	0.77 (0.09)		0.72 (0.08)		0.80 (0.08)		0.848
Self-esteem	PPI	1.00 (0.06)	0.369	1.43 (0.08)	0.008	1.37 (0.07)	0.003	0.003
	Control	1.10 (0.06)		1.12 (0.06)		1.02 (0.06)		0.236
Self-efficacy	PPI	1.07 (0.08)	0.880	1.36 (0.09)	0.014	1.21 (0.08)	0.121	0.244
	Control	1.08 (0.07)		1.07 (0.06)		0.99 (0.08)		0.938
Subjective well-being	PPI	0.90 (0.07)	0.516	1.61 (0.07)	0.012	1.30 (0.07)	0.020	0.026
	Control	1.32 (0.07)		1.36 (0.06)		1.05 (0.08)		0.275
Positive mood	PPI	1.15 (0.08)	0.759	1.38 (0.05)	0.008	1.30 (0.07)	0.037	0.080
	Control	1.18 (0.08)		1.03 (0.1)		1.05 (0.08))		0.286

Data are presented as mean (standard deviation); OHI = Oxford Happiness Inventory; PPI = positive psychology intervention; * Between-group significance; ¥ represents within-group significance level in PPI and control groups.

despite an increased score in the positive mood dimension, the difference did not reach a significant level. The OHI total score and its dimensions remained nearly constant across baseline, post-PPI time point, and 45 days later in the control group (Table 3).

4. Discussion

One of the main goals of positive psychology is to develop interventions to promote well-being and happiness, except for the self-efficacy dimension; therefore, the present study evaluated the effectiveness of this approach in promoting happiness in women with unintended pregnancy.

We observed that PPIs can improve happiness and its dimensions among women with unintended pregnancies, and that the improvement could last for 45 days. Several studies demonstrated the efficacy of PPIs such as setting personal goals [35, 36], counting blessings [37, 38, 39], practicing kindness [38], expressing gratitude [39, 40], and using personal strengths to improve well-being and alleviate depressive symptoms [39]. Such interventions are usually provided in a self-help format. Sin and Lyubomirsky, in a meta-analysis, reported that PPIs significantly enhance well-being and decrease depressive symptoms. They added that items such as depression, self-selection, age of participants, as well as the format and duration of the interventions can affect the success of PPIs. As such, they concluded that clinicians may consider incorporating positive psychology techniques into their everyday clinical practice, particularly for treating highly motivated clients who are depressed and are relatively older. They also recommended that PPIs should be delivered as individual (versus group) therapy and for relatively longer periods of time [27].

Bolier et al. conducted a meta-analysis to determinethe effectiveness of PPI in general population and individuals with particular psychosocial problems. They concluded that PPIs could effectively enhance subjective and psychological well-being and help reducing depressive symptoms [26]. Lyuobomirsky and Layous have attempted to develop a positive-activity model to explain under what conditions performing positive intentional activities enhance happiness. They suggested that positive activities increase positive emotions, thoughts, and behaviors; all of which enhance well-being. According to their model, features of positive activities (e.g., dosage and variety), as well as those of the person (e.g., motivation and effort) influence the degree to which the activities improve well-being. They concluded that an optimal person-activity fit (i.e., the overlap between positive activity and characteristics of a person) predicts improvement in well-being [25].

We observed that the improvement in the happiness sustained up to 45 days after the interventions were completed. Few studies have investigated the long-term effectiveness of the PPIs, and they were all

prone to the high attrition rates at follow-up. At follow-up from three to six months, PPIs have been shown to have small but still significant effects on subjective well-being and psychological well-being. These observations indicate that effects were partly sustained over time [26]. Woodworth et al. also questioned the sustainable effectiveness of this approach. The researchers stated that the application of interventions based on this approach does not always cause changes in the well-being level, and the effectiveness of using these interventions as a sustainable self-help tool is called into question [41]. Considering the results of the present study regarding the unsustainable effect of PPIs on the self-efficacy dimension, integrating this program with routine pregnancy care for a longer period seems necessary.

4.1. Strength and limitations

The strength of the current study lies in its within-group nature. Several former studies have made between-group comparisons; such designs may not necessarily illustrate chnges that occur among individuals [41]. Some limitations to our study merit mentioning. First, our study was not directly designed to investigate the effectiveness of the PPIs on improving the outcome of unintended pregnancies. Therefore, it remains to be clarified if PPIs annihilated negative psychological effects of unintended pregnancy. However, based on the findings of the current study, such improvement could be hypothesized, and our findings now can rationalize conducting future researches appropriately designed to address this topic directly. Second, our follow-up period was relatively short. The current study, however, was designed to investigate the effectiveness of the PPIs to improve happiness among women with unintended pregnancy. The length of the follow-up might make sense if looked upon in light of the fact that pregnancy is not a long period of time. Third, our study sample might have not had statistical power large enough to capture trivial improvement that might have occurred in the self-efficacy. Therefore, we decided not to perform further subgroup analyses to explore the possible contribution of covariate factors in the level of happiness of the participants.

In the present research, some possible variables affecting the research results, such as psychological disorders, were not identified, and personality traits were not evaluated in both groups due to the lack of cooperation by psychiatrists. However, participants were asked about their history of mental diseases and were excluded from the study if they had any of them. Also, considering that the present research was conducted in the city of Islamabad and in the specific Kurdish social and cultural context, the results may not be generalizable in other societies with different socio-cultural conditions.

5. Conclusions

We observed that PPIs can improve happiness measured by OHI and its dimensions among women with unintended pregnancy and that the improvement could last for about 45 days. According to the results, it is suggested that healthcare planners take one step beyond paying exclusive attention to the frequency and severity of disease and mortality indicators while providing health care to pregnant women, especially in the case of unplanned pregnancies. They should help women with unplanned pregnancies adapt to unintended conditions experienced as well as promote their self-care and pregnancy health in this vulnerable group by formulating strategies to hold training courses with a positive psychology approach as well as recognizing and promoting their positive aspects and strengths.

Declarations

Author contribution statement

Zahra Rastad, Marzieh Kaboudi: Conceived and designed the experiments; Performed the experiments; Contributed reagents, materials, analysis tools or data; Wrote the paper.

Mohsen Golmohammadian: Conceived and designed the experiments; Wrote the paper.

Amir Jalali, Bijan Kaboudi: Analyzed and interpreted the data; Wrote the paper.

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Data availability statement

Data included in article/supplementary material/referenced in article.

Declaration of interests statement

The authors declare no conflict of interest.

Additional information

No additional information is available for this paper.

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