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Effectiveness of cognitive behavioral therapy in pregnant women at risk of postpartum depression

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Abstract

Introduction: Postpartum depression has a high prevalence of mental disorders among mothers, but regarding its treatment, few attempts have been made with cognitive-behavioral approaches, so the purpose of this study is to investigate the effectiveness of cognitive therapy. Behavior in pregnant women was at risk of postpartum depression.

Research method: The research method of this study is a semi-experimental type with a control group. Pregnant women without a diagnosis of depression participated in the study, who were divided into two groups: a group at risk for depression (CBT) and a control group (no treatment). Preventive treatment consisted of six CBT sessions held weekly. Outcome measurement questionnaire (QQ-45) was used in all sessions. The short international neuropsychological interview and the Beck depression questionnaire were used based on three situations. Final statistical analyzes were performed with Poisson regression.

Findings: The results showed that the prevalence of postpartum depression was 5.5% in the risk group and 2.2% in the control group without any difference between the groups (PR 1.66 95% CI 0.44-6.18). QQ-45 averages gradually decreased during treatment sessions, which indicated treatment progress. Education was a factor, both related to postpartum depression symptoms and more effective treatment.

Conclusion: The use of short-term cognitive behavioral therapy by mental health professionals is effective in preventing postpartum depression symptoms.

Keywords: cognitive-behavioral therapy, outcome measurement, postpartum depression, pregnancy

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Introduction:

The term postpartum depression refers to the condition that occurs for a mother following the birth of a child. This disorder includes depression, anxiety, lack of interest in the baby and feelings of inadequacy as a mother. Postpartum depression occurs in 10 to 15 percent of mothers within one to five weeks after delivery (1).Pregnancy and postpartum periods show themselves with physical, emotional, social and hormonal changes that make women sensitive to the occurrence or increase of some symptoms or even severe mental disorders, such as depression (1). Depression during the pregnancy-delivery period shows that the incidence rate can vary between 10-20% for the pregnancy period (2) and between 15-25% (3) for the postpartum period. The prevalence rate of postpartum depression (PPD) is 12% (4). As a result of this research, many efforts by researchers to help define an effective, low-cost and especially preventive treatment for the course of Childbirth and thus, minimizing the traumatic consequences that have an inevitable impact on the whole family has been done.Previous studies have mentioned some factors related to PPD, such as low social support, lack of family planning, anxiety, and low level of education and history of depression in the past (5). These treatments are effective for pregnancy and postpartum depression (6), however, most studies proceed with behavioral treatments, while descriptions of the efficacy of preventive disease models are rare.

Therefore, we are looking for psychotherapy models that are able to prevent the occurrence of this disease with short treatment protocols and, as a result, a lower cost of treatment services (7). In this context, cognitive-behavioral therapies (CBT) have been prioritized because they show evidence of improvement in depression symptoms and people's functioning based on behavioral and cognitive changes through cognitive restructuring and behavioral activation techniques (6). CBT is a model that has been shown to be highly effective for depressed patients (8) as well as for the prevention of depression in cases at risk of depression/or subsyndromal cases (9).

Given that depression is a leading cause of disability worldwide, research on the efficacy of preventive protocols for PPD can provide important information on the overall burden of disease (10). Maternal depression, in particular, creates enormous costs for health systems, which can be minimized if preventive treatment is implemented. The aim of this study is to evaluate the effectiveness of cognitive-behavioral therapy for postpartum depression in women at risk of developing PPD.

Rrsearch method:

The research method of this study is a semi-experimental type with a control group. Pregnant women without a diagnosis of depression participated in the study, who were divided into two groups: a group at risk for depression (CBT) and a control group (no treatment). Preventive treatment consisted of six CBT sessions held weekly. Outcome measurement questionnaire (QQ-45) was used in all sessions. The short international neuropsychological interview and the Beck depression questionnaire were used based on three situations. Final statistical analyzes were performed with Poisson regression. The sampling process started in 2019, mothers whose

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pregnancy had passed at most 24 weeks were invited to participate in this study. Sampling took 24 months. . The sample size calculation for this study was done using the parameters of 20% prevalence of postpartum depression, 80% power, two percentage point margin of error. With an increase of 30%, 514 volunteers were required to reduce or reject sample members. However, the calculations that led to the need to collect a larger number of pregnant women are related to other hypotheses related to other objectives that require a larger sample size. Treatment follow-up assessments occurred in three periods: the first period was between the first and second trimesters (T1 - prenatal treatment), which was administered in the participants' homes; A second course in an outpatient setting between 90 and 60 days after the first Evaluation was performed (2T - postnatal treatment); And the third period, the third trimester after delivery (T3) is when the outcome of PPD is evaluated.

All women who were at least 24 weeks pregnant and living in random census areas were invited to participate in the study. Pregnant women were included in this study who agreed by signing an informed consent form, and who had no recent symptoms and diagnosis of a major depressive episode and agreed to participate in treatment if needed. Therefore, pregnant women were selected from the urban areas of Tehran who agreed to do all the steps mentioned in this study.

Preventive cognitive-behavioral psychotherapy: The presented CBT technique includes an adapted version of the Cognitive Behavioral Psychotherapy Guide (11), which is structured based on the proposal presented by Aaron Beck (1964). This model proposes psychotherapy in six stages that address distorted and/or dysfunctional thoughts and opinions (which affect the patient's mood and behavior), which are focused on the pregnancy-childbirth period. Eligible participants received 50-minute weekly sessions of individual psychotherapy, for a total of 6 sessions. The first session focused on establishing a therapeutic alliance and identifying disturbances in cognition, emotion, and/or behavior that were related to underlying symptoms of depression. The main goal of the second session was the psychological training of the cognitive model and understanding the role of thoughts in the disorders identified in the first session. However, in the second session, a self-monitoring exercise was prescribed as a homework. The purpose of the third session was to improve the self-monitoring technique and understand how the cognitive model is applied in the life of a pregnant woman. Cognitive and/or behavioral techniques were used in the fourth and fifth sessions to improve the coping strategies of the patients. In the last session, the whole process was modified in order to reinforce the skills taught.

Psychotherapy was carried out in Mehrdostan psychological clinic in Tehran and was supervised by a researcher trained in the proposed model. Data analysis included all pregnant women who attended at least one psychotherapy session (intention-to-treat analysis). This study has psychotherapists (psychiatrists and psychiatrists) with at least 5 years of previous experience in mental health, but without specific training in CBT, trained later in the process. This team is trained based on a guideline developed for the proposed treatment with the aim of reducing uncertainties and standardizing the sessions. Therefore, the therapists had weekly meetings with the general

coordinator and with the trainer responsible for the treatment in order to control and monitor each participant.

The outcome-PPD- was evaluated through the short international neuropsychological interview three months after delivery (T3). The aim of this study was diagnostic classification in a manner consistent with the criteria of the Diagnostic Guide for Mental Disorders (DSM-IV-TR) and the International Classification of Diseases (ICD 10) and the "Plus" version of the tool, which allowed clinical judgment about the interviewee. In this research, module "A" was used, which examines the presence of a major depression episode in the present or past. The same instrument was used during the first assessment with study participants (T1), in a home interview, and also, in the second Assessment (T2) was applied, which occurred in an outpatient setting. Risk of suicide as an exclusion criterion was also used through module C of the interview.

The outcome questionnaire (OQ-45.2) was used in all sessions to monitor the results of psychotherapy. This is a self-test questionnaire designed specifically to assess changes during psychotherapy treatments. This questionnaire included 45 questions with answer options ranging from 0 (never) to 4 (always) regarding emotional resentment, interpersonal relationships, and the patient's social role. Therefore, the lower the scores, the greater the perception of patients' progress during psychotherapy (12).

Anxiety and depression subsyndrome symptoms were evaluated using Beck scales. Beck Depression Inventory (BDI-II) (13) and Beck Anxiety Inventory (BAI) (14) were used for all follow-up assessments. Both scales included 21 questions about cognitive, emotional, and physical symptoms on the BDI and common anxiety symptoms on the BAI. The total score of each instrument was in the range of 0-36 points, and for this study, the cut-off point was 10-18 points as subsyndromal depression (BDI-II) and 9-18 points as subsyndromal anxiety (BAI). We used the BDI-II as a continuous mean as an index of depressive symptom severity, by calculating the difference in means between assessment times and across groups (control group and depression-exposed group). Also, mean adjustment analysis for outcome factors was performed.

The diagnosis of stressful events in the past year was made through the Holmes and Rahe (1967) Readjustment Rating Scale, which consisted of 24 situations in which pregnant women answered the question whether they had experienced these situations during the previous 12 months. This tool is used based on the proposition that the effort required to adapt a person to society after significant changes in his life has so many complications that it makes a person prone to diseases. In this study, the events were divided into a maximum of "3 events" or "4 or more events" and the event of pregnancy was replaced by the event of marital reconciliation (14).

Findings :

In this study, 578 pregnant women were eligible, of which 336 were in the control group, that is, women without risk of depression and therefore did not receive any treatment. The remaining 242 women in the group were depressed and received preventive treatment for postpartum depression

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using a CBT protocol. During follow-up assessments, both the control group and the group at risk for depression experienced dropout (details in Figure 1).

Among 242 pregnant women, in the group at risk for depression, 199 (82.2%) participated in the treatment evaluation and follow-up 90 days after delivery. In the control group, 270 women (80.3%) participated in the postpartum evaluation.

Exploratory analyzes were performed to verify the factors related to reduction and non-acceptance. Regarding the group at risk for depression, we found no difference in the Z-score of depression-related risk measures between pregnant women who received treatment and pregnant women at risk for depression who refused to participate and were excluded from the study (p=0.855). Non-acceptance to participate in postpartum assessment was not related to Z-score (p=0.660) and also to socio-demographic factors (age, living with a partner, socioeconomic status) (p>0.05). In the case of the control group, having less education was not associated with not continuing the follow-up after delivery (PR 2.28-4.23 95% CI 1.23). The first analysis of treatment effect comparing both groups (control group/no treatment and group at risk of depression/with treatment) was performed in the T2 period when the mean gestational age was 27.1 weeks (SD ± 5.9). The prevalence of postpartum depression at this time was 0.7% for the control group and 2.2% for the group at risk of depression, without any difference between the groups (p=0.248).

Table 1 shows the characteristics of the base sample (N=578) and the bivariate analysis between the independent variables (exposure) and PPD (N=469). They had a significant relationship with the outcome by having a maximum of 8 years of education (p=0.017) and showing subsyndromal depression during pregnancy (p=0.008). Variables showing $p < 0.20$ in bivariate analysis (Table 1) were selected for a Poisson regression-adjusted analysis: treatment model (control group/group at risk for depression), age, education, living with partner, pregnancy planning Depression under the syndrome and stressful events.

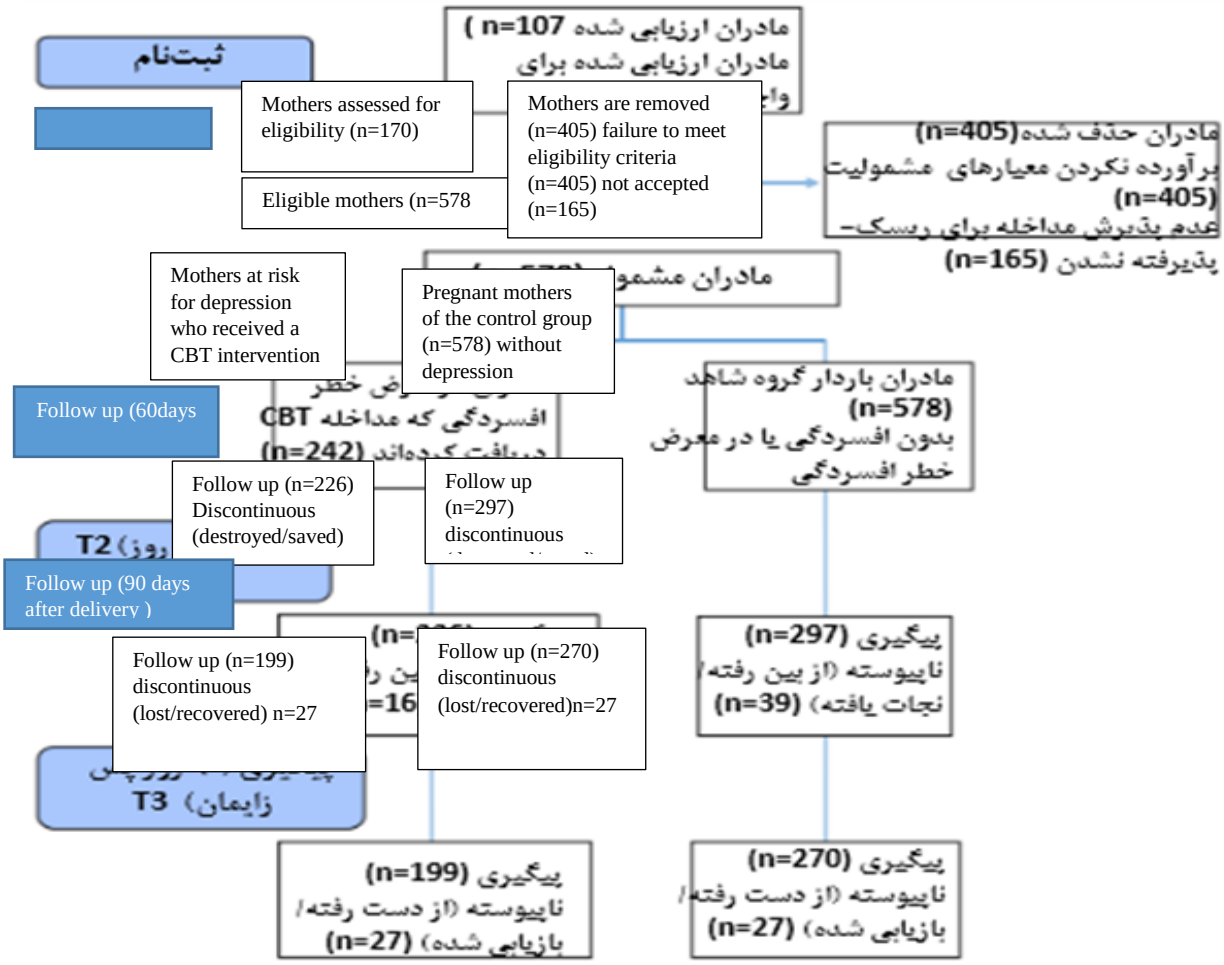

Figure 1. Flow diagram of the concert process in the intervention study

The Z-score variable of the sum of the risk measures was used to separate the analyses, therefore, it did not cause any confounding in the results. After adjustment for confounders, results continued to show that PPD was associated with women aged 30 years or older and with less education (Table 2). Following these analyses, an evaluation of the effect of the treatment process was conducted through the OQ-45 instrument and was performed for all women in the group at risk of depression and the group that received preventive psychotherapy.

Figure 2 shows the averages of self-perceived progress for each session. It can be seen that the total average in the first session is 47.3 points, while in the last session of the protocol (session 6), the average was 36.3 points. These values gradually increased during the period Treatment decreased. Considering the difference of the averages in the overall sample between the first and the sixth session, we can understand that there is a significant decrease evaluated with the OQ-45 ($p < 0.01$).

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Comparing self-perceived progress, defined by education, we confirmed a higher level of therapeutic progress (OQ-45) among pregnant women with lower education. In the mean values of the educational groups corresponding to the lower quartile, compared to other groups, it can be seen that there was already a difference in the second session, which became more intense until the end of the psychotherapy period ($p < 0.01$) (Figure 2).

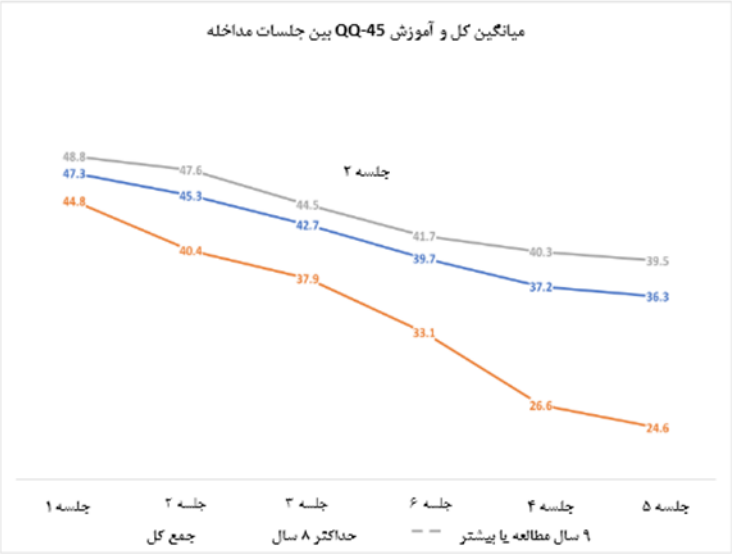

Figure 2. QQ-45 means between treatment sessions

As another analysis, the severity of depression symptoms was also examined in order to increase the better understanding of the results with an emphasis on education. With regard to the age variable, no differences were found in mean postnatal (T3) depressive symptoms in relation to initial treatment between controls and PPD-at-risk groups, nor were there any differences in OQ-45 means. Not observed ($p > 0.05$).

Figure 3 shows the BDI-II averages and their differences among the assessment times of pregnant women with lower education (up to 8 years of education/lower quartile), comparing the control group and the group at risk of depression.

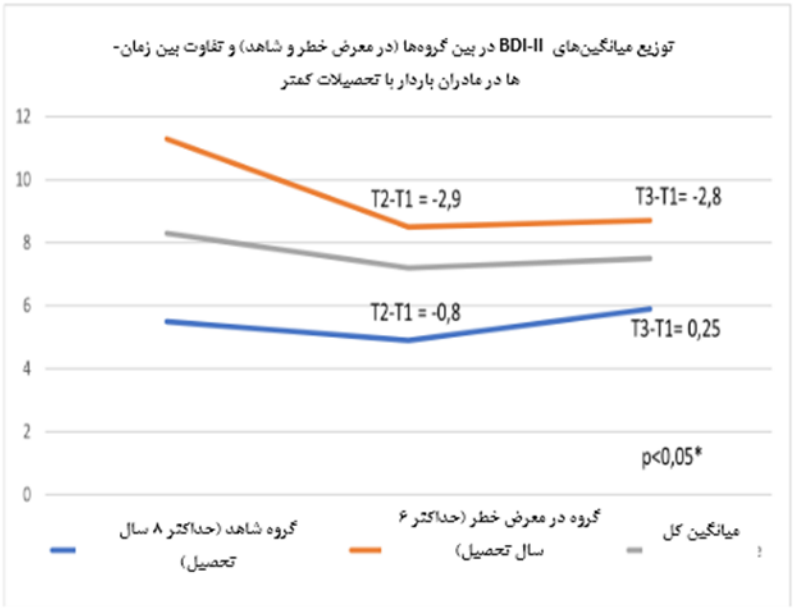

Figure 3. Distribution of BDI-II means across assessments

In the higher education group, no difference was found in the T3-T1 period BDI-II mean between the at-risk and control groups, indicating that the higher education group remained with depressive symptoms of the same severity regardless of treatment.

When we moved to the analysis of the factor of lower education, we found a prevalence of PPD of 7.1% for the at-risk group and a prevalence of 9.1% for the control group (p = 0.732), with no association between the control and the at-risk group in terms of We found an incidence (PR 0.77 95% CI 0.19-3.03). However, when we evaluated the group with higher education separately, we found a 4.7% prevalence of PPD in the at-risk group and a 0.9% prevalence in the control group, and women in the at-risk group with higher education compared to Women in the control group suffer from PPD 5.46 times more often.

Table 1- Sample characteristics and bivariate analysis through X^2 test between independent variables (exposure) and PPD

Variable		**Sample specifications**			
	Value p	N (%)	The sum of both group N (%)	At risk group N (%)	**Control group N (%)**
Age	0.099				
maximum 23 years		03 (2.2)	181 (31.3)	82 (33.9)	**99 (29.5)**

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between 24 and24 years 30 years or more		03 (2.1)	173 (29.9)	71 (29.3)	**102 (30.4)**
		11 (5.9)	224 (38.8)	89 (36.8)	**135 (40.2)**
Social level economic	0.333				
A+B		04 (2.7)	177 (31.2)	61 (25.8)	**116 (35.0)**
C		09 (3.5)	317 (55.9)	132 (55.9)	**185 (55.9)**
D+E		04 (7.0)	73 (12.9)	43 (18.2)	**30 (9.1)**
education ab	0.009				
Maximum8 years)		09 (7.9)	156 (27.0)	92 (38.0)	
9 years or more					**64 (19.1)**
		08 (2.3)	421 (73.0)	150 (62.0)	**271 (80.9)**
Living with a partner b	0.085				
No					
Yes		04 (8.3)	68 (11.8)	45 (18.6)	**23 (6.8)**
		13 (3.1)	510 (88.2)	197 (81.4)	**313 (93.2)**
Family member with mental illness b	0.291				
No		09 (2.9)	396 (68.5)	122 (50.4)	**274 (81.5)**
yes		08 (5.2)	182 (31.5)	120 (49.6)	**62 (18.5)**
Mother support b	0.239				
No		00 (0.0)	55 (9.5)	32 (13.2)	**23 (6.8)**
Yes		17 (4.0)	523 (90.5)	210 (86.8)	**313 (93.2)**
Pregnancy planning b	0.069				
No					
Yes		10 (5.9)	211 (36.5)	122 (50.4)	**89 (26.5)**
		07 (2.3)	367 (63.5)	120 (49.6)	**247 (73.5)**
Sub syndromic depression (BDI-II) b	0.008				

No		05 (1.7)	370 (64.0)	86 (35.5)	**284 (84.5)**
Yes		12 (7.6)	208 (36.0)	156 (64.5)	**52 (15.5)**
Anxiety under the syndrome (BDI-II) b	0.765				
No		13 (3.5)	465 (80.4)	158 (65.3)	**307 (91.4)**
Yes		04 (4.0)	113 (19.6)	84 (34.7)	**29 (8.6)**
Stressful events EARS – Homes/Rahe (ab)	0.082				
No		04 (1.9)	271 (47.0)	49 (20.2)	**222 (66.3)**
Yes		13 (5.1)	306 (53.0)	193 (79.8)	**113 (33.7)**
History of chronic disease b	0.505				
No		13 (3.3)	472 (81.7)	174 (71.9)	**298 (88.7)**
Yes		04 (5.1)	106 (18.3)	68 (28.1)	**38 (11.3)**
History of depression b	0.721				
No		14 (3.5)	504 (87.2)	180 (74.4)	**324 (96.4)**
Yes		03 (4.5)	74 (12.8)	62 (26.6)	**12 (3.6)**
Intervention	0.079				
No (control group)		06 (2.2)	336 (59.3)	-	-
Yes (at risk group)					
The sum of both groups		11 (5.5)	242 (40.7)	-	-
		17 (3.6)	578 (100.0)	242 (100.0)	336 (100.0)

a variable missing

b variables that p < 0.05 between control groups and at-risk groups in X^2 to show

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Table 2- Poisson regression multivariate analysis

Variable	Postpartum depression	
	Value P	**RP (95% CI)**
Age		
Maximum 23 years	-0.645	**1**
Between 24 and 29 years	0.021	**1.49 (0.27-0.08)**
30 years or more		**5.13 (1.28-20.48)**
Level of education		
9 years or more	-	**1**
Maximum 8 years	0.11	**4.12 (1.38-12.33)**
Intervention		
No (control group)	-	**1**
Yes (the group at risk PPD)	0.451	**1.66 (0.44-6.18)**

Discussion and conclusion:

The results of this study show the effectiveness of a cognitive-behavioral therapy for postpartum depression. Of all women assessed as being at risk of developing the disease, 5.5% showed diagnostic symptoms in an assessment performed 90 days postpartum. In addition, we found that the occurrence of depressive diseases was no longer related to the at-risk group compared to the control group, because although there was a percentage difference in the initial analysis, this difference was not significant, and after multivariate analysis related to the results. was not These findings show that the treatment group and the control group were treated in the same way in terms of the presence of PPD.

We face a more complicated situation by implementing a preventive treatment based on previously studied risk factors. For this reason, in the bibliography section, we selected 10 factors that are most related to PPD and many of these factors are closely related to this mental disorder. The found prevalence of 5.5% does not necessarily mean that we have prevented 94.5% of women from developing postpartum, however, comparing this group of women with those who were not at high risk (progressing PPD), It is important. Therefore, we hypothesize that this treatment was effective in preventing PPD.

Following the same series of comments, we confirmed an association between the Z-score of the sum of risk measures and the presence of PPD, which reinforces the association between these characteristics and the incidence of the disease. However, when we analyzed the control and at-risk groups separately, there was no association indicating the ability of preventive treatment to reduce the impact of risk factors on PPD outcomes, and the incidence of the disorder was similar among the control and risk groups for depression. was not observed.

Also, an element that came up in this analysis was the therapeutic progress observed during the sessions. It was possible to detect a gradual decrease in OQ-45 means, indicating that pregnant women experienced a decrease in emotional disturbance related to issues focused on the preventive treatment model, even without a previous diagnosis of depression. It is believed that the Rhine Addressing destructive thoughts related to the period of pregnancy and postpartum by providing a new perspective for patients about what is experienced and will be experienced, reflecting in the form of a low prevalence of PPD in this group can create the impression of recovery. It should be remembered that this group was selected because they have three or more high risk factors for PPD.

However, there is one factor in particular that makes us focus on more specific analyses: education. When we achieved a significant reduction in depressive symptoms in the at-risk group in relation to the control group, especially with less education, we were able to understand that our treatment was more effective in this subgroup. These findings raise three issues: lower education alone should be considered as a possible factor that indicates the need for special attention in the pregnancy-delivery period, even in those women who do not show collective risk factors; Our treatment produced a better symptom response to depression in women at risk of PPD with less education, and our treatment protocol model may be more appropriate for women with less education.

The fact that a lower level of education is associated with PPD has been mentioned in studies (15), and this issue should still be considered. In the control group, those with lower education were more likely to develop PPD. Although, this condition was considered a risk factor, we found that women participating in preventive treatment sessions achieved a greater treatment improvement in response to reduction in depressive symptoms. In addition to Raine, although the prevalence of PPD is higher in the at-risk group compared to the control group, this difference was not significant when we only observed those with lower education.

When we developed this treatment, a secondary goal was to test the hypothesis that therapists with the initial training and education we provided, along with the supervision of experts with specific training in CBT, would be able to effectively implement a preventive CBT treatment protocol in They are in the early stages of pregnancy. Therefore, all psychotherapists had preliminary training, so that by confirming the effectiveness of the treatment, we were able to announce to other centers with the results that no special training is necessary for the effective implementation of this protocol. This will certainly reduce costs and enable a workforce without expertise in this field to

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implement such therapy while following a structured protocol under the supervision of a trained specialist. And this is based on the idea that confirming the effectiveness of such a model will sustain its use in primary public health services.

A limitation of our study is the nonadmission rate for prophylactic treatment, which is a 40.5% primary nonadmission rate. However, the rejection rate (non-acceptance) for this type of treatment is also high in other samples, which could indicate that 59.5% is an acceptable acceptance rate. By creating a Z-score of the sum of the risk measures, there was no difference between the means of those who did not accept and those who agreed to start treatment, so the risk burden did not differ between groups. Another limitation was the decrease in the number of participants during the treatment process, 59.5% in the control group and 17.8% in the risk group did not participate in the postpartum follow-up. In addition, it should be noted that these pregnant women had no indication of treatment related to any diagnosis, but the criteria considered regarding the risk of developing depression which may make it difficult to understand the importance of the suggested follow-up, as well as in a motivation which involves a pregnant woman attending six sessions at a predetermined time and place, removing her from daily activities in the middle of a pregnancy. Astin (2008) on reducing the risk of depression indicate that pregnant women with subsyndromic depressive symptoms may reject the theory that there is a possibility of postpartum problems in them (16) Low prevalence of PPD compared to other studies with The use of screening tools to evaluate such results can represent another limitation (17). However, the choice of a diagnostic tool such as Mini Plus is consistent with the goals of this therapeutic study, which aims to diagnose rather than screen. Mini Plus is an accepted interview for a clinical framework and assessment of patients with worse conditions and represents an economic option for selecting patients based on international criteria in both clinical and epidemiological studies (18). This evaluation was done by interviewers with previous training and periodical support and checking each interview with a positive diagnosis. In addition to RAIN, we used the BDI-II for severe symptoms, a widely applicable measure that can be parameterized for longitudinal measurements and thus create comparable measures at different times.

As indicated in the results of the sessions, we performed multivariate analyses. Regarding the main risk factor related to the results, the level of education, by calculating the power of the sample, a power of 79.3% was achieved. This validates the results of greater treatment efficacy in women with less education, both as measured by the MiniPlus and II-BDI with respect to depressive symptoms, and by perception of progress as measured by the OQ-45. This can be considered a positive aspect rather than a limitation of the results. Also, the absence of a group with similar characteristics in another treatment model may be a limitation of our study, and a control group without treatment is a comparison group. However, the choice of treatment was made with a model with strong indications of efficacy against depression.

In this way, too, it should be noted that according to our study, psychotherapy provided individually may be more effective than psychotherapy for pregnant women at risk of developing PPD, which was shown by Austin et al. (19).

According to the above, we understand through our findings that experimental protocols that can prevent PPD, reduce maternal psychological harm during this period and avoid long-term losses are more than relevant. This is both because PPD is often the first episode of harm as a result of a mood disorder that repeats throughout life with disability for these women and negative consequences for their children, and because of the high costs that such a disease has for health and systems. It brings public and private social security throughout the life of this woman. Such emotional and financial consequences are frequently reported in studies related to pregnancy complications as a result of depression during the pregnancy-delivery period. (19)

Based on our evaluations, this effect can be reduced by adopting an effective protocol. With regard to the public health system, a protocol similar to the one used in our study (short and subsequently low-cost) is effective in preventing the occurrence of PPD, especially among women with lower education that mental health professionals with preliminary training are able to apply. It has the ability to have a positive effect on patients. Therefore, we can obtain wider external validity and, as a result, increase the validity of this treatment plan.

Ethical considerations: Ethical principles observed in this research: obtaining written consent form from the patients to participate in the aforementioned treatment course, observing the principle of confidentiality, informing the subjects of the research objectives, paying attention to the health and comfort of the subjects. Having the right to choose to participate or not to participate in the research throughout the stages without the need to explain to the subject or face coercion by the researcher and holding free treatment sessions was for the control group at the end of the research.

Conflict of interest: The authors hereby declare that this work is the result of an independent research and does not have any conflict of interest with other organizations and persons.

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