

ORIGINAL RESEARCH ARTICLE

The effect of three- and six-session prenatal haptonomy on pregnancy-related anxiety, distress, and psychological well-being: A randomized controlled trial

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Hilal Ozbek^{1*} and Sukran E. Pinar²

Department of Midwifery, Faculty of Health Sciences, Tokat Gaziosmanpasa University, Tokat, Türkiye¹; Child Development Program, Vocational School of Health Services, Sivas Cumhuriyet University, Sivas, Türkiye²

*For Correspondence: Email: hilal.ozbek@gop.edu.tr

Abstract

This randomized controlled trial examined the effects of prenatal haptonomy on pregnancy-related anxiety, distress, and psychological well-being. A total of 102 pregnant women were randomly assigned to a three-session haptonomy group, a six-session haptonomy group, or a control group receiving routine antenatal care. Data were collected using the Pregnancy-Related Anxiety Questionnaire-Revised 2, Tilburg Pregnancy Distress Scale, and Psychological Well-Being Scale at baseline, post-intervention, and follow-up. Repeated measures analysis of variance was used to evaluate group, time, and group $\times$ time effects, and effect sizes were reported using partial eta squared (partial η^2). In intragroup analyses, the six-session haptonomy group demonstrated a significant reduction in pregnancy-related anxiety, whereas the three-session haptonomy group showed significant reductions in distress and improvements in psychological well-being. Intergroup comparisons revealed statistically significant differences in anxiety, distress, and psychological well-being scores between the haptonomy groups and the control group at post-intervention and follow-up. Repeated measures analysis demonstrated significant group effects for pregnancy-related anxiety, distress, and psychological well-being. These findings suggest that prenatal haptonomy may contribute to improved maternal psychological health during pregnancy, with different intervention durations associated with benefits at different assessment points. (*Afr J Reprod Health* 2026; 30 [19]: 50-60).

Keywords: prenatal haptonomy; pregnancy-related anxiety; distress; psychological well-being

Résumé

Cet essai contrôlé randomisé a examiné les effets de l'haptonomie prénatale sur l'anxiété liée à la grossesse, la détresse et le bien-être psychologique. Au total, 102 femmes enceintes ont été réparties aléatoirement dans un groupe d'haptonomie en trois séances, un groupe d'haptonomie en six séances ou un groupe témoin recevant les soins prénatals habituels. Les données ont été recueillies à l'aide du Pregnancy-Related Anxiety Questionnaire-Revised 2, de l'échelle de détresse de grossesse de Tilburg et de l'échelle de bien-être psychologique au départ, après l'intervention et lors du suivi. Une analyse de variance à mesures répétées a été utilisée pour évaluer les effets du groupe, du temps et de l'interaction groupe $\times$ temps, et les tailles d'effet ont été rapportées à l'aide de l'eta carré partiel (η^2 partiel). Dans les analyses intragroupes, le groupe d'haptonomie en six séances a montré une réduction significative de l'anxiété liée à la grossesse, tandis que le groupe d'haptonomie en trois séances a présenté des réductions significatives de la détresse ainsi qu'une amélioration du bien-être psychologique. Les comparaisons intergroupes ont révélé des différences statistiquement significatives des scores d'anxiété, de détresse et de bien-être psychologique entre les groupes d'haptonomie et le groupe témoin après l'intervention et lors du suivi. L'analyse de variance à mesures répétées a démontré des effets de groupe significatifs pour l'anxiété liée à la grossesse, la détresse et le bien-être psychologique. Ces résultats suggèrent que l'haptonomie prénatale peut contribuer à l'amélioration de la santé psychologique maternelle pendant la grossesse, différentes durées d'intervention étant associées à des bénéfices à différents moments d'évaluation. (*Afr J Reprod Health* 2026; 30 [19]: 50-60).

Mots-clés: haptonomie prénatale; anxiété liée à la grossesse; détresse; bien-être psychologique

Introduction

Pregnancy brings about many mental, physical, and hormonal changes in women, causing symptoms of anxiety and stress to reach their highest level.¹ The

prevalence of anxiety, stress, and depression during pregnancy ranges between 13% and 25%.^{2,3} During this period, anxiety may not be fully recognized due to the psychological changes associated with pregnancy.⁴ Prenatal anxiety and stress adversely

affect the physical and psychological development of both the pregnant woman and the fetus, united with the mother.² Moreover, maternal anxiety and stress during pregnancy may negatively affect maternal well-being and pregnancy experiences.⁵ The stress adversely affects physical activity, nutrition, and sleep in pregnant women, as well as the development of the newborn in the postpartum period.⁶ Additionally, the pregnant woman may also experience distress due to her inability to adapt to the role of motherhood, the duties and responsibilities she will assume with motherhood, and her beliefs, values, and attitudes.⁷ In this case, without adequate maternal bonding, psychological well-being, which is an important component of psychological health, can be severely diminished.^{8,9} Reduced psychological well-being has been associated with increased maternal cortisol levels and fetal stress responses, which may negatively affect fetal development.¹⁰

Supporting pregnant women through early coping strategies is therefore essential for maternal, fetal, and neonatal health throughout pregnancy and the postpartum period.¹¹ In this period, nonpharmacological methods such as music, relaxation exercises, yoga and mindfulness-based approaches are mainly used to reduce the stress and anxiety levels of pregnant women.^{12–14} In recent years, prenatal haptonomy has emerged as another non-pharmacological approach within this context.¹⁵

Haptonomy is a "Life sciences" field that studies communication and interaction in human relationships, considering people's emotional areas.^{15,16} Prenatal haptonomy involves guided tactile interaction with the maternal abdomen to promote emotional connection between the mother, father, and fetus.^{17,18} It was reported in the literature that haptonomy provides harmony between spouses,¹⁹ supports prenatal attachment, reduces pregnancy stress²⁰ and fear of childbirth^{20,21} and supports adaptation to pregnancy and psychological preparation for delivery.^{18,22}

This study may guide planning and implementing the care provided by health professionals particularly working with pregnant women. This may improve the quality of life of pregnant women by increasing their physical and mental well-being. Furthermore, prenatal

haptonomy can reduce the psychological distress of pregnant women and prevent physical and psychological symptoms that may affect both mother and baby during pregnancy, labor, and the postpartum period, including low birth weight, prolonged labor, postpartum hemorrhage, pregnancy stress, and fear of childbirth. Although several international studies have examined the effects of haptonomy during pregnancy, evidence regarding its impact on pregnancy-related anxiety, distress, and psychological well-being remains limited.^{20,21,23,24}

Moreover, haptonomy is a relatively new concept in Turkey, and no study has yet been identified that simultaneously examines its effects on pregnancy-related anxiety, distress, and psychological well-being. In addition, evidence comparing different durations of prenatal haptonomy interventions remains scarce. Therefore, this study is innovative in evaluating the effects of both three-session and six-session prenatal haptonomy interventions on pregnancy-related anxiety, distress, and psychological well-being. Therefore, the present study was conducted to determine the effect of prenatal haptonomy on pregnancy-related anxiety, distress, and psychological well-being in pregnant women.

Hypotheses

H1: There is a significant difference in distress levels between pregnant women who receive prenatal haptonomy and those who receive routine antenatal care across baseline, post-intervention, and follow-up assessments.

H2: There is a significant difference in pregnancy-related anxiety levels between pregnant women who receive prenatal haptonomy and those who receive routine antenatal care across baseline, post-intervention, and follow-up assessments.

H3: There is a significant difference in psychological well-being levels between pregnant women who receive prenatal haptonomy and those who receive routine antenatal care across baseline, post-intervention, and follow-up assessments.

Methods

This study was designed as a randomized controlled experimental trial and was registered at ClinicalTrials.gov (NCT05494840).

Participants

The study population consisted of pregnant women between the 22nd and 27th gestational weeks who applied to a pregnancy education class at a state hospital in the Black Sea region of Turkey. Due to the COVID-19 pandemic, the pregnancy class was suspended between January 2021 and February 2022, and the total population size could not be fully documented. An a priori power analysis was conducted using G*Power 3.1.9.7. Based on previously reported effect size data, a two-tailed test with an effect size of 0.70, an alpha level of 0.05, and a statistical power of 80% indicated that a minimum of 24 participants per group was required.²⁵ To account for possible attrition, 35 pregnant women were initially allocated to each group (total $n = 105$). Participants were randomly assigned to one of three groups: Intervention Group 1 (three sessions of haptonomy), Intervention Group 2 (six sessions of haptonomy), or a control group receiving routine antenatal care, using an online randomization tool (<https://randomizer.org/>). Three participants withdrew from the study, and the final sample consisted of 102 pregnant women (Figure 1).

Randomization and blinding

Eligible participants provided written informed consent and were randomly assigned in a 1:1:1 ratio to Intervention Group 1, Intervention Group 2, or the control group using an online randomization tool (<https://randomizer.org/>). Randomization was performed by an independent researcher who was not involved in participant recruitment or data collection, and the allocation sequence remained concealed until participant assignment was completed.

Due to the nature of the intervention, blinding of participants and intervention providers was not feasible. However, outcome assessments and data analyses were conducted by researchers who were blinded to group allocation. Data were collected between September 1, 2022, and September 30, 2023.

Inclusion Criteria: Married women aged 18 years or older, primiparous, between 22 and 27 weeks of gestation, residing in the provincial center, with a

spontaneous pregnancy, without maternal or fetal health problems, without perception or communication difficulties, and who provided written informed consent were included in the study.

Exclusion criteria: Pregnant women with a diagnosed psychiatric disorder, high-risk pregnancy, chronic medical conditions requiring regular medication, pregnancy complications diagnosed at baseline, multiple pregnancies, or those receiving concurrent psychological or complementary interventions were excluded from the study.

Withdrawal criteria: Participants were withdrawn from the study if they declined to continue participation, missed more than one intervention session, developed pregnancy-related complications during the study period, or provided incomplete outcome data.

Data collection tools

Pregnant information form: This form was developed by the researchers based on the relevant literature and consisted of 20 items. Thirteen items assessed sociodemographic characteristics of the participants, including age, education level, occupation, and income status, while seven items addressed obstetric characteristics such as gestational age and pregnancy history.

Pregnancy-related anxiety questionnaire-revised 2 (PRAQ-R2): The scale was originally developed and later revised for use in pregnant women regardless of parity.²⁶ The Turkish validity and reliability study of the scale was subsequently conducted.²⁷ The Turkish version consists of 11 items for primiparous women, scored on a five-point Likert scale, with total scores ranging from 11 to 55. Higher scores indicate higher levels of pregnancy-related anxiety. In the Turkish validation study, Cronbach's alpha coefficients ranged between 0.87 and 0.94. In the present study, Cronbach's alpha coefficient was 0.90.

Tilburg pregnancy distress scale (TPDS): The scale was developed to assess pregnancy-related distress, and its Turkish validity and reliability

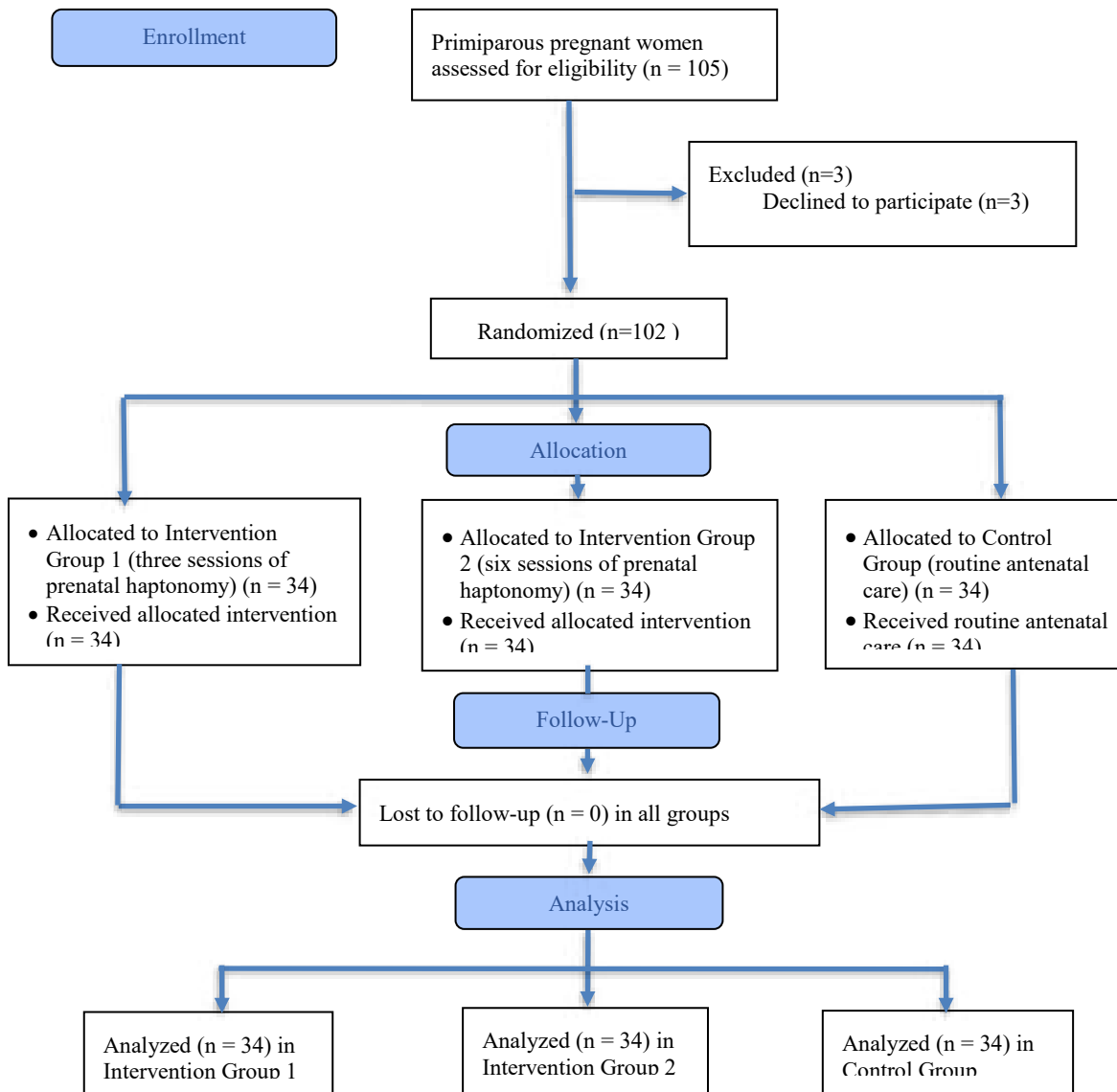


Figure 1: CONSORT flow diagram

study was subsequently conducted.^{28,29} The scale consists of 16 items and is a five-point Likert-type instrument that can be applied to pregnant women at 12 weeks of gestation and above. The total score ranges between 0 and 48. According to the cut-off point, a total score of 28 and above indicates that the pregnant woman is at risk for distress. In the validity and reliability study, Cronbach's alpha coefficient was reported as 0.83. In the present study, Cronbach's alpha coefficient was 0.79 across all follow-ups.

Psychological well-being scale (PWBS): The scale was developed and later adapted into Turkish.^{30,31} The scale consists of eight items scored on a seven-point Likert scale, with total scores ranging from 8 to 56. Higher scores indicate greater psychological resources and strengths. In the Turkish validity and reliability study, Cronbach's alpha coefficient was reported as 0.80. In the present study, Cronbach's alpha coefficients were 0.86 in the first follow-up, 0.89 in the second follow-up, and 0.83 in the third follow-up.

Procedure

The researcher received theoretical and practical "Haptonomy Training" on haptonomy. At the end of the training, a certificate of participation was given to the researcher indicating that they could apply haptonomy. The mat and sitting cushions in the pregnant class were arranged by the researcher in a suitable way for the application. Music was played during the application. For the music listening, a selection of wellness music recommended by the trainer specialized in haptonomy was made, and the same music was used for each pregnant woman to ensure a standardized practice. Haptonomy was performed individually with pregnant women.

Pregnant women in Intervention Groups 1 and 2 received haptonomy along with the training in the pregnancy class (standard care practices), while pregnant women in the control group received only the training in the pregnancy class (standard care practices). The standard training provided in the pregnancy class covers the physiology of reproductive health covering the prenatal period, birth and postnatal period, problems that can be experienced during pregnancy, the birth process, and newborn care.

Intervention groups 1 and 2

Baseline assessments were conducted prior to the intervention using the Pregnant Information Form, PRAQ-R2, TPDS, and PWBS. Participants were informed about the purpose and procedure of haptonomy, and each session lasted approximately 45 minutes. Sessions were conducted at seven-day intervals. Intervention Group 1 received three sessions, and Intervention Group 2 received six sessions. Outcome measures were reassessed post-intervention (Week 3) and at follow-up (Week 6).

Haptonomy sessions

Each session included guided breathing exercises, relaxation techniques, focused body awareness, and gentle abdominal touch exercises aimed at supporting emotional regulation and maternal awareness. Sessions concluded with breathing exercises similar to those used at the beginning of the session.^{15,18,32}

Control group

Participants in the control group completed baseline assessments and received routine antenatal education only. Outcome measures were repeated at post-intervention (Week 3) and follow-up (Week 6).

Statistical analysis

Data were analyzed using IBM SPSS Statistics version 20.0. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarize participant characteristics and study variables. The normality of continuous variables was assessed using skewness and kurtosis values. Differences in sociodemographic and obstetric characteristics between groups were analyzed using the chi-square test or one-way analysis of variance, as appropriate. To examine the effects of prenatal haptonomy on pregnancy-related anxiety, distress, and psychological well-being over time, repeated measures analysis of variance was conducted to assess group, time, and group $\times$ time interaction effects. The assumption of sphericity was assessed using Mauchly's test. When the assumption was violated, Greenhouse–Geisser corrections were applied. Effect sizes were reported using partial eta squared (partial η^2). When significant effects were detected, post hoc analyses with Bonferroni correction were applied. All randomized participants completed the study and were included in the final analyses; therefore, no missing outcome data were observed and no imputation procedures were required. All statistical analyses were performed using a two-tailed approach with a 95% confidence interval, and a p value of <0.05 was considered statistically significant.

Ethics approval and consent to participate

The study was approved by a local non-interventional clinical research ethics committee (Approval No: 2022-07/12). Institutional permission was obtained from the study site. All participants were informed about the purpose and procedures of the study, and written informed consent was obtained prior to participation. The

study was conducted in accordance with the principles of the Declaration of Helsinki.

Results

Socio-demographic characteristics

The socio-demographic and obstetric characteristics of pregnant women in the control and intervention groups are presented in Table 1. There were no statistically significant differences among the groups in terms of age, gestational week, duration of marriage, education level, employment status, income status, relationship with spouse, presence of a supporting family member, intention and planning of pregnancy, regularity of antenatal follow-ups, mode of delivery, or practice with the baby ($p > 0.05$). These findings indicate that the groups were comparable and homogeneously distributed at baseline.

Effects of prenatal haptonomy on pregnancy-related anxiety (PRAQ-R2)

Within-group comparisons of PRAQ-R2 scores showed no statistically significant changes over time in the control group ($F = 2.080$, $p = 0.141$) or in Intervention Group 1, which received three sessions of haptonomy ($F = 1.680$, $p = 0.202$). In contrast, a statistically significant within-group difference was observed in Intervention Group 2, which received six sessions of haptonomy ($F = 7.470$, $p = 0.002$), indicating a reduction in pregnancy-related anxiety over time.

Between-group comparisons revealed no significant differences in PRAQ-R2 scores at baseline ($p = 0.060$). However, significant differences were observed among the groups at post-intervention ($p = 0.031$) and follow-up ($p = 0.002$). Bonferroni post hoc analysis indicated that the difference at post-intervention was primarily between the control group and Intervention Group 2. At follow-up, PRAQ-R2 scores in Intervention Group 2 were significantly lower than those in the control group and Intervention Group 1 (Table 2).

Effects of prenatal haptonomy on pregnancy-related distress (TPDS)

Within-group analysis of TPDS scores showed no significant changes over time in the control group

($F = 1.275$, $p = 0.293$) or in Intervention Group 2 ($F = 2.429$, $p = 0.104$). In contrast, Intervention Group 1 demonstrated a statistically significant within-group difference across measurement points ($F = 5.351$, $p = 0.010$). Post hoc comparisons revealed that distress levels in Intervention Group 1 were significantly lower at post-intervention compared to baseline. Between-group comparisons showed no significant differences in TPDS scores at baseline ($p = 0.121$). Significant differences were found among the groups at post-intervention ($p = 0.024$) and follow-up ($p = 0.020$). Bonferroni post hoc analysis demonstrated that, at post-intervention, distress levels in Intervention Group 1 were significantly lower than those in the control group and Intervention Group 2. At follow-up, distress levels in Intervention Group 2 were significantly lower than those in the control group and Intervention Group 1 (Table 2).

Effects of prenatal haptonomy on psychological well-being (PWBS)

Within-group comparisons of PWBS scores revealed no statistically significant changes over time in the control group ($F = 0.106$, $p = 0.900$) or in Intervention Group 2 ($F = 0.182$, $p = 0.834$). However, a significant within-group difference was observed in Intervention Group 1 ($F = 3.662$, $p = 0.037$). Post hoc analysis indicated that psychological well-being scores in Intervention Group 1 were significantly higher at post-intervention compared to baseline. Between-group comparisons showed no significant differences in PWBS scores at baseline ($p = 0.097$). Significant differences were observed among the groups at post-intervention ($p = 0.041$) and follow-up ($p = 0.022$). Bonferroni post hoc analysis indicated that, at post-intervention, PWBS scores in Intervention Group 1 were significantly higher than those in the control group and Intervention Group 2. At follow-up, PWBS scores in Intervention Group 2 were significantly higher than those in the control group and Intervention Group 1 (Table 2).

Repeated-measures ANOVA effect size analysis

Repeated-measures ANOVA results are presented in Table 3. Significant group effects were observed for pregnancy-related anxiety ($F=5.572$, $p=0.005$,

Table 1: Socio-demographic characteristics of pregnant women

Characteristics	Control (n=34)	Intervention 1 (n=34)	Intervention 2 (n=34)	p value
Age (years)	25.97±4.46 (19-36)	26.73±5.17 (19-39)	26.94±4.94 (19-38)	0.688
Gestational week	23.17±1.69 (20-28)	23.29±1.42 (22-27)	23.44±1.52 (22-27)	0.781
Years of marriage	2.14±1.37 (1-7)	1.97±1.38 (1-8)	2.33±2.26 (1-9)	0.641
Education, n (%)				
Primary	9 (26.5)	8 (23.5)	7 (20.6)	0.822
High School	12 (35.3)	15 (44.1)	17 (50.0)	
University/ higher	13 (38.2)	11 (32.4)	10 (29.4)	
Employment status, n (%)				
Working	6 (17.6)	7 (20.6)	10 (29.4)	0.482
Not working	28 (82.4)	27 (79.4)	24 (70.6)	
Income status, n (%)				
Income < expenditure	14 (41.2)	8 (23.5)	7 (20.6)	0.088
Income = expenditure	16 (47.0)	22 (64.7)	17 (50.0)	
Income > expenditure	4 (11.8)	4 (11.8)	10 (29.4)	
Relationship with spouse, n (%)				
Good	32 (94.1)	31 (91.2)	30 (88.2)	0.694
Average	2 (5.9)	3 (8.8)	4 (11.8)	
Supporting person in the family				
Yes	15 (44.1)	12 (35.3)	10 (29.4)	0.447
No	19 (55.9)	22 (64.7)	24 (70.6)	
Intention of pregnancy, n (%)				
Yes	33 (97.1)	31 (91.2)	34 (100.0)	0.162
No	1 (2.9)	3 (8.8)	0(0.0)	
Planned pregnancy, n (%)				
Yes	25 (73.5)	26 (76.5)	29 (85.3)	0.471
No	9 (26.5)	8 (23.5)	5 (14.7)	
Status of pregnancy follow-ups, n (%)				
Yes	34 (100.0)	34 (100.0)	33 (97.1)	0.364
No	0 (0.0)	0 (0.0)	1 (2.9)	
Mode of delivery, n (%)				
NVD	24 (70.6)	20 (58.8)	24 (70.6)	0.494
Caesarean section	10 (29.4)	14 (41.2)	10 (29.4)	
Practice with her baby, n (%)				
Yes	23 (67.6)	25 (73.5)	27 (79.4)	0.546
No	11 (32.4)	9 (26.5)	7 (20.6)	

Table notes: Values are presented as mean ± standard deviation or number (percentage). p values were calculated using one-way ANOVA or chi-square test, as appropriate. Intervention 1: three sessions of prenatal haptonomy; Intervention 2: six sessions of prenatal haptonomy

partial $\eta^2=0.101$), pregnancy-related distress ($F=5.114$, $p=0.008$, partial $\eta^2=0.094$), and psychological well-being ($F=4.153$, $p=0.019$, partial $\eta^2=0.077$), indicating moderate effect sizes. Significant time effects were found for pregnancy-related anxiety ($F=14.046$, $p<0.001$, partial $\eta^2=0.124$) and pregnancy-related distress ($F=6.737$, $p=0.001$, partial $\eta^2=0.064$). However, no significant

time effect was observed for psychological well-being ($F=0.470$, $p=0.626$, partial $\eta^2=0.005$). Group $\times$ time interaction effects were not statistically significant for pregnancy-related anxiety ($F=1.215$, $p=0.307$, partial $\eta^2=0.024$), pregnancy-related distress ($F=0.262$, $p=0.902$, partial $\eta^2=0.005$), or psychological well-being ($F=0.690$, $p=0.600$, partial $\eta^2=0.014$).

Table 2: Intra- and intergroup comparisons of PRAQ-R2, TPDS, and PWBS scores among pregnant women

Time point	Control (n=34)	Intervention 1 (n=34)	Intervention 2 (n=34)	Between-group (F/p)
PRAQ-R2				
Baseline	41.91±7.85	38.17±7.23	38.70±5.48	2.893/0.060
Post-intervention	40.14±7.31 ^a	36.70±7.83	35.67±6.38 ^b	3.590/ 0.031
Follow-up	40.08±8.29 ^a	35.11±7.57 ^b	33.67±7.18 ^b	6.496/ 0.002
Within-group (F/p)	2.080/0.141	1.680/0.202	7.470/ 0.002	
TPDS				
Baseline	28.61±7.64	25.85±5.17	26.02±5.28	2.159/0.121
Post-intervention	27.23±8.35 ^a	23.23±5.60 ^b	23.73±4.90 ^b	3.869/ 0.024
Follow-up	27.23±5.69 ^a	23.94±5.68 ^b	23.52±6.22 ^b	4.062/ 0.020
Within-group (F/p)	1.275/0.293	5.351/0.010	2.429/0.104	
PWBS				
Baseline	42.65±8.99	47.44±3.62	49.17±5.28	2.392/0.097
Post-intervention	45.50±9.38 ^a	48.91±3.16 ^b	48.61±3.47 ^b	3.311/ 0.041
Follow-up	45.29±7.16 ^a	47.55±2.87	48.58±3.66 ^b	3.964/ 0.022
Within-group (F/p)	0.106/0.900	3.662/ 0.037	0.182/0.834	

Table notes: Values are presented as mean ± standard deviation. Different superscript letters (^a, ^b) indicate statistically significant differences between groups at the same time point (Bonferroni post hoc test, $p < 0.05$). Within-group comparisons were performed using repeated measures analysis of variance. Between-group comparisons at each time point were conducted using one-way analysis of variance. PRAQ-R2: Pregnancy-Related Anxiety Questionnaire–Revised 2; TPDS: Tilburg Pregnancy Distress Scale; PWBS: Psychological Well-Being Scale. Intervention 1: three sessions of prenatal haptonomy; Intervention 2: six sessions of prenatal haptonomy

Table 3. Repeated-measures ANOVA results for pregnancy-related anxiety, distress, and psychological well-being

Outcome	Effect	F	p	Partial η^2
PRAQ-R2	Time	14.046	<0.001	0.124
	Group	5.572	0.005	0.101
	TimeXGroup	1.215	0.307	0.024
TPDS	Time	6.737	0.001	0.064
	Group	5.114	0.008	0.094
	TimeXGroup	0.262	0.902	0.005
PWBS	Time	0.470	0.626	0.005
	Group	4.153	0.019	0.077
	TimeXGroup	0.690	0.600	0.014

Note: Partial eta squared (η^2) values of approximately 0.01, 0.06, and 0.14 indicate small, medium, and large effect sizes, respectively.

PRAQ-R2: Pregnancy-Related Anxiety Questionnaire–Revised 2; TPDS: Tilburg Pregnancy Distress Scale; PWBS: Psychological Well-Being Scale.

Discussion

Haptonomy is a practice aimed at psychological balance, trust and emotional well-being based on emotional exchange through touch.³² It is also effective in reducing anxiety levels, preventing psychological disorders, and increasing psychological well-being^{19,20}. Lower pregnancy-related anxiety scores were observed in the six-

session haptonomy group, particularly at follow-up assessments. Anxiety increases plasma concentrations of catecholamines, leading to both weakened uterine contractility and prolonged second stage of labor. Therefore, it is important to reduce anxiety in the prenatal period.³³ It has been reported that haptonomy reduces anxiety and has positive psychological effects on women during pregnancy and childbirth.¹⁹ In another study

evaluating the effect of haptonomy on maternal depressive and anxiety symptoms during pregnancy, it was reported that depression and anxiety symptoms were lower in women who received haptonomy compared to women who received traditional prenatal care.³⁴ Furthermore, studies showing that haptonomy reduces anxiety, supporting our study, are also available in the literature.^{19,20,32,34}

Within-group analyses showed a significant reduction in distress scores in the three-session group, while between-group comparisons demonstrated lower distress scores in both haptonomy groups compared with the control group at post-intervention and follow-up assessments. Pregnancy is a period of intense stressors for women.^{5,35} It has been reported that the practice of haptonomy increases stress tolerance.¹⁹ Haptonomy practice slows down the heart, allows individuals to relax, and calms them down, helping to eliminate any negative effects that may occur. In addition, by reducing stress during pregnancy, maternal and fetal risks due to stress can be minimized.¹⁹ It was determined that perceived stress levels decreased during the second and third follow-up assessments among pregnant women who received haptonomy.²⁰ These findings are consistent with previous studies reporting that haptonomy may contribute to the reduction of stress and psychological distress during pregnancy.^{19,36,37}

Higher psychological well-being scores were observed at post-intervention in the three-session group and at follow-up in the six-session group. Psychological well-being scores were higher at different assessment points across the intervention groups, suggesting that the timing of the observed benefits may vary according to the duration of haptonomy practice. In a study involving seven sessions of haptonomy, couples were interviewed, and haptonomy was reported to provide emotional relief and to facilitate the realization of birth plans.¹⁹ One study also found that haptonomy psychologically relaxes the person.³² Furthermore, there are studies in the literature showing that haptonomy is effective in increasing the psychological well-being of individuals and reducing stress, anxiety, and fear of childbirth, which negatively affect their psychological well-being.^{19–21,24,37,38} The findings of

the present study are also consistent with reports from other non-pharmacological prenatal interventions, including mindfulness-based programs, yoga, and relaxation techniques, which have been associated with improvements in maternal psychological well-being and reductions in psychological distress during pregnancy.^{39–41} Similar findings have been reported in systematic reviews evaluating prenatal mindfulness- and yoga-based interventions.^{39,42,43}

Limitations and strengths

Several limitations should be considered when interpreting the results of this study. First, the sample consisted exclusively of primiparous pregnant women residing in a single region of Turkey, which may limit the generalizability of the findings. Second, the study was conducted at a single center and included assessments only during pregnancy; therefore, long-term postnatal outcomes were not evaluated. Additionally, multiparous women were not included in the sample. Despite these limitations, the study has notable strengths. It employed a randomized controlled design with three parallel groups, allowing for comparison of different haptonomy intervention doses. One of the strengths of this study is that it evaluated the effects of a brief, three-session prenatal haptonomy intervention on maternal psychological outcomes. The findings suggest that shorter haptonomy interventions may provide psychological benefits during pregnancy and may be considered as a potentially feasible supportive approach within antenatal care settings.

Conclusion and recommendations

Six sessions of prenatal haptonomy were associated with lower pregnancy-related anxiety scores among pregnant women. In addition, both three- and six-session haptonomy interventions were associated with reduced pregnancy-related distress and higher psychological well-being scores. These findings suggest that even brief haptonomy interventions may provide psychological benefits during pregnancy. Prenatal haptonomy may be considered as a supportive non-pharmacological approach within antenatal care to promote maternal mental

health during pregnancy. Further studies are needed to confirm these findings and to evaluate the long-term effects of different intervention durations.

Authors' contributions

Conceptualization (SEP, HO), Formal analysis (SEP), Methodology (SEP), Investigation (HO), Visualization (HO), Data collection (HO), Supervision (SEP), Writing – original draft (SEP, HO), Writing – review & editing (SEP, HO).

All authors read and approved the final manuscript.

Conflict of interest

The authors report no conflict of interest.

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Availability of data and material

The data that support the findings of this study are available from the corresponding author, upon reasonable request.

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References

1. Bilgen O, Tekim U. Marriage satisfaction in the last three months of pregnancy and its effect on depression. *Int J Soc Educ Sci*. 2020;2:138–153.
2. Yazar M, Demir A. Examination of stress, anxiety, and depression in the prenatal period: A traditional review. *Karatay Univ J Health Sci*. 2023;4:197–211.
3. Rabinowitz EP, Kutash LA, Richeson AL, Sayer MA, Samii MR, Delahanty DL. Depression, anxiety, and stress in pregnancy and postpartum: A longitudinal study during the COVID-19 pandemic. *Midwifery*. 2023;121:103655.
4. Kaya Zaman F, Ozkan N, Toprak D. Depression and anxiety during pregnancy. *Konuralp Med J*. 2018;10:20–25.
5. Basharpour S, Heydarirad H, Daryadel SJ, Heydari F, Ghamari Givi H, Kishore J. The role of perceived stress and social support in predicting anxiety during pregnancy. *J Holist Nurs Midwifery*. 2017;27:9–16.
6. Yan H, Ding Y, Guo W. Mental health of pregnant and postpartum women during the COVID-19 pandemic: A systematic review and meta-analysis. *Front Psychol*. 2020;11:617001.
7. Ciltas NY, Kose Tuncer S. Defining distress during pregnancy: An example from Erzincan. *Mehmet Akif Ersoy Univ J Health Sci Inst*. 2019;7:15–24.
8. Bilgic G, Citak Bilgin N. Relationship between fear of childbirth and psychological and spiritual well-being in pregnant women. *J Relig Health*. 2021;60:295–310.
9. de Matos MB, Scholl CC, Trettim JP, Molina ML, Soares MC, Coelho FT, Castelli RD, da Silva RA, Pinheiro KAT, Coelho FMC, Quevedo LA, Pinheiro RT. Perception of parental bonding in pregnant adolescents and its association with generalized anxiety disorder. *Eur Psychiatry*. 2018;54:51–56.
10. Fagbenro DA, Benjamin EO, Folasade AO. Influence of stages of pregnancy on psychological well-being of pregnant women in Ibadan, Nigeria. *Int J Caring Sci*. 2018;11:719–724.
11. Simsek Kucukkelepce D, Aydin Ozkan S, Yilmaz S. Investigation of the relationship between postpartum depression in primiparous pregnant women experiencing psychological distress during pregnancy: Prospective study. *J Soc Anal Health*. 2022;2:8–14.
12. Kilic A, Can Gurkan O. Evidence-based use of music therapy during pregnancy, childbirth, and postpartum. *KTO Karatay Univ J Health Sci*. 2021;2:47–60.
13. Hulsbosch LP, Nyklicek I, Potharst ES, Meems M, Boekhorst MGBM, Pop VJM. Online mindfulness-based intervention for women with pregnancy distress: Design of a randomized controlled trial. *BMC Pregnancy Childbirth*. 2020;20:1–10.
14. Duman M, Durgun Ozan Y, Aksoy Derya Y, Timur Tashan S. The effect of relaxation exercises training on pregnancy-related anxiety after perinatal loss: A pilot randomized control trial. *Explore*. 2022;18:44–50.
15. Célestin-Lhopiteau I, Wanquet-Thibault P. *Haptonomie*. In: Guide des pratiques psychocorporelles. 2nd ed. France: Elsevier Health Sciences; 2018. p. 186–190.
16. Veldman F. Confirming affectivity: The dawn of human life. *Neuroendocrinol Lett*. 2001;22:295–304.
17. Arabin B, Metz GAS. Environmental enrichment“ und Schwangerschaft Paradigmen (epi)genetischer Folgen sozialer oder sensueller Stimulation. *Der Gynäkologe*. 2020;53:433–443.
18. Özbek H, Rathfich G. Haptonomy. In: Baltacı N, Doğan Yükseköl Ö, Kızılkaya Beji N, editors. Integrative Practices and Care in Women's Health. 1st ed. Ankara: Nobel Academic Publishing; 2023. p. 917–929.
19. Adam EM. *L'haptonomie: Un projet pour une naissance* [Master's thesis]. Université Henri Poincaré, Nancy I; 2012.
20. Ozbek H, Pinar SE. The effect of haptonomy applied to pregnant women on perceived stress, fear of

- childbirth, and prenatal attachment: randomized controlled experimental study. *Current Psychology*. 2023;42:23313–22.
21. Alivand Z, Nourizadeh R, Hakimi S, Esmacilpour K, Mehrabi E. The effect of cognitive-behavioral therapy and haptonomy on fear of childbirth in primigravida women: a randomized clinical trial. *BMC Psychiatry*. 2023;23:1–10.
 22. Fernández-Arroyo M. Childbirth education: A comparative analysis. In: Jovandaric MZ, Milenkovic SJ, editors. *Childbirth*. London: IntechOpen; 2020. p. 137–144.
 23. Nur Yilmaz A, Aksoy Derya Y. The effects of haptonomy and virtual reality, anxiety, prenatal attachment and acceptance of pregnancy in unplanned pregnancy. *Journal of Reproductive and Infant Psychology*. 2025;25:1,
 24. Dorosti E, Nourizadeh R, Mehrabi E, Herizchi S. The Effect of Haptonomy Intervention on Fear of Childbirth and Maternal- Fetal Attachment Among Primigravid Women. *Current Women s Health Reviews*. 2022;19(4):39-47.
 25. Faul F, Erdfelder E, Buchner A, Lang AG. Statistical power analyses using G*Power 3.1. *Behav Res Methods*. 2009;41:1149–1160.
 26. Huizink AC, Delforterie MJ, Scheinin NM, Tolvanen M, Karlsson L, Karlsson H. Adaptation of the PRAQ-R2 for all pregnant women. *Arch Womens Ment Health*. 2016;19:125–132.
 27. Aksoy Derya Y, Timur Tashan S, Duman M, Durgun Ozan Y. Turkish adaptation of the Pregnancy-Related Anxiety Questionnaire-Revised 2. *Midwifery*. 2018;62:61–68.
 28. Capik A, Pasinlioglu T. Validity and reliability study of the Tilburg Pregnancy Distress Scale into Turkish. *J Psychiatr Ment Health Nurs*. 2015;22(4):260–269.
 29. Pop VJM, Pommer AM, Pop-Purceanu M, Wijnen HAA, Bergink V, Pouwer F. Development of the Tilburg Pregnancy Distress Scale: the TPDS. *BMC Pregnancy Childbirth*. 2011;11:1–8.
 30. Diener E, Scollon CN, Lucas RE. The Evolving Concept of Subjective Well-Being: The Multifaceted Nature of Happiness. In: Diener, E. (eds) *Assessing Well-Being. Social Indicators Research Series, vol 39*. Springer, Dordrecht. 2009;39:67–100