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ORIGINAL ARTICLE

The Effect of Psych-education on Fear of Childbirth and Postpartum Outcome: Systematic Review and Meta Analysis

Psiko-Eğitimin Doğum Korkusu ve Doğum Sonrası Sonuçlara Etkisi: Sistematik İnceleme ve Meta Analiz

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ABSTRACT

Aim: Although there are some studies examining the effects of psycho-education on fear of childbirth and outcomes in the postpartum period, high-quality evidence is lacking. This systematic review and meta-analysis study aimed to evaluate the effects of psycho-education on fear of childbirth and postpartum outcomes.
Methods: The literature search was completed by a comprehensive and systematic search of the PubMed, CINAHL, Scopus and Science Citation Index (Web of Science) databases until December 2022. Outcome data including the effect of psycho-education on fear of childbirth, labor and birth outcomes were collected for analysis. In the preparation of the systematic review and meta-analysis, the guidelines in the Cochrane Interventions Manual of Systematic Reviews and Preferred Reporting Items for Systematic Reviews and Meta-Analysis guidelines (PRISMA) were based on the recommendations of the guidelines followed. Data were analyzed using the Review Manager computer program (Version 5.3). Cochrane risk-of-bias tools were used in the quality assessment of the studies.
Results: Eight randomized controlled trials were included in the meta-analysis: all 8 studies were combined for fear of childbirth. In the meta-analysis, it was seen that psycho-education decreased the fear of birth (MD: 10.18 95% CI: 9.32 to 11.05, Z = 23.09, p < 0.00001) in pregnant women when the anxiety and depression rate (SMD: -0.36 95% CI: -0.57 to -0.15, Z = 3.34, p=0.0008) were examined, it was seen that there was no difference in depression, it decreased the cesarean section (SMD: -0.35 95% CI: -0.49 to -0.22, Z = 5.19, p<0.00001) rate and increased the self-efficacy (SMD: 0.38 95% CI:0.25 to 0.51, Z =5.58 p <0.00001) rate.
Conclusion: This study provides sufficient evidence that psycho-education is effective in reducing fear of childbirth, anxiety, and cesarean section rates, while increasing self-efficacy.
PROSPERO Registration Number: CRD42022379561

Key words: Tokophobia, Psycho-education, Primiparous, Meta-analysis, Systematic review

ÖZ

Amaç: Psiko-eğitimin doğum korkusu ve postpartum dönemdeki sonuçlar üzerindeki etkilerini inceleyen bazı çalışmalar olmasına rağmen, yüksek kalitede kanıt yoktur. Bu sistematik inceleme ve meta analiz çalışması, psiko-eğitimin doğum korkusu ve postpartum sonuçlar üzerindeki etkilerini değerlendirmeyi amaçlamıştır.
Yöntemler: Literatür araştırması, Aralık 2022'ye kadar PubMed, CINAHL, Scopus ve Science Citation Index (Web of Science) veri tabanlarının kapsamlı ve sistematik araştırması ile tamamlandı. Psiko-eğitimin, doğum korkusu, doğum eylemi ve doğum sonuçları üzerindeki etkisini içeren sonuç verileri analiz için toplandı. Sistematik inceleme ve meta-analizin hazırlanmasında, Cochrane Müdahalelerinin Sistematik İncelemeler El Kitabı ve Sistematik İncelemeler ve Meta-analiz için Tercih Edilen Raporlama Öğelerindeki (PRISMA) yönergeler izlendi. Veriler, Review Manager bilgisayar programı kullanılarak analiz edildi (Version 5.3). Çalışmaların kalite değerlendirmesinde Cochrane risk-of-bias araçları kullanılmıştır.
Bulgular: Sekiz randomize kontrollü çalışma meta-analize dahil edildi: Sekiz çalışmanın tamamı doğum korkusunu değerlendirdi ve çalışma sonuçları için birleştirildi. Meta-analiz, psikoeğitimin hamile kadınların doğum korkusu oranını azalttığı (MD: 10.18 95% CI: 9.32 to 11.05, Z = 23.09, p<0.00001), anksiyeteyi azalttığı (SMD: -0.36 95% CI: -0.57 to -0.15, Z = 3.34, p=0.0008), sezaryen tercihlerinin azaldığı ve farkın anlamlı olduğu (SMD: -0.35 95% CI: -0.49 to -0.22, Z = 5.19, p<0.00001), öz-yeterlilik oranını (SMD: 0.38 95% CI:0.25 to 0.51, Z =5.58 p <0.00001) arttırmada etkili olduğunu ortaya koydu.
Sonuç: Bu çalışma, psikoeğitimin doğum korkusu, anksiyete ve sezaryen oranını azaltmada, öz-yeterlilik durumunun ise arttırmada etkili olduğuna dair yeterli kanıt sunmaktadır.
PROSPERO Kayıt Numarası: CRD42022379561

Anahtar kelimeler: Tokofobi, Eğitim, Primipar, Meta-analiz, Sistematik inceleme

Introduction

Fear of childbirth (FOC), also known as tokophobia or maieusiophobia, has been described as a minor to extreme psychological disorder that affects women from childhood to old age (1,2). The prevalence of FOC, even when measured in the same way, varies between countries (3). Reasons for the variances are unknown; however different ways of measuring FOC, as well as cultural differences are possible explanations for differing prevalence rates (2-4). A meta-analysis estimated the global pooled-prevalence at 14.2%

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noting increased prevalence in recent years, which may attribute to increased awareness and reporting. FOC represents a specific dimension within a spectrum of pregnancy-related anxiety (5). Expected labor pain has been reported to play an important role in the development and/or maintenance of such symptoms (6). According to Bandura (7), a pregnant woman with a high level of FOC believes that she will not be capable of successfully coping with birth (self-efficacy expectancy; SEE) and is unable to identify courses of action. If a woman with FOC is unable to mobilise resources of her own she might not expect a favourable birth process (outcome-efficacy expectancy; OEE) (7).

Several studies have shown that the causes of FOC are thought to be obstetric, psychological and socio demographic factors (advanced maternal age, high socio-economic status, primiparity, poor mental health, anxiety disorders and previous experiences of trauma and abuse, insufficient antenatal psycho-education, obstetric complications, increased analgesic use in labor, postdate pregnancy, low self- esteem, and low level of acceptance of pregnancy) (8,9).

FOC can impact on women's birth choices and outcomes. Women with FOC are more likely to choose an elective cesarean section than those without FOC (10). Previous studies have reported that sleep disturbances, nightmares, palpitations, stomach pains, panic attacks, flashbacks (after trauma) and a request for a cesarean are associated with FOC (2,3,5). Furthermore, the impact on emotional well-being may be long-term and powerful, affecting partner relationships and breastfeeding (2). FOC is related to post traumatic stress disorder (PTSD) as both are responses to negative birth experiences. These conditions are interrelated since FOC can be a result of PTSD, and influence women not only after birth, but also during following pregnancies implying long-term consequences for women and their relationships (8,10) This is in line with results suggesting the development of FOC as a vicious circle of negative expectations and experiences of childbirth from pregnancy, birth, and the postpartum period, to future pregnancy and childbearing (8).

Several treatments have been suggested to help women with fear of childbirth. A recent systematic review of results from 15 research projects on treatment for fear of birth showed that group psycho-education or therapeutic conversions could decrease the levels of caesarean sections due to fear of birth (11). Previous studies have reported that women with fear of birth in general are very satisfied with the counselling services (12,13). The aim of the counselling is to strengthen women's self-confidence in giving birth and to reduce their fear and the number of caesarean sections on maternal request. Furthermore, the counselling ideally makes the birth experience as positive as possible (12). Few studies have reported success regarding this matter, as only around only 50% of fearful women report a positive birth experience (14,15). The vicious cycle between a negative birth experience and childbirth fear is well known and often results in a request for caesarean section in a subsequent pregnancy (2). In addition, fearful women reported significantly more deficiencies in intrapartum care compared to women without fear, especially regarding support from midwives (31%) and perception of control (40%) (13).

To prevent poorer outcomes related to FOC, early detection and evidence-based interventions are key, and should therefore be available to women. Reviews of the evidence suggest that interventions with a psycho-education component may reduce FOC (13,14). But the previous reviews did not evaluate evidence quantitatively using meta-analysis. This may have led to a bias in conclusions where interventions that have been more widely examined are more likely to be evaluated as promising. Therefore, this systematic review and meta-analysis study aimed to investigate the effects of psycho-education on fear of childbirth and postpartum outcomes.

For this purpose, answers to the following questions were sought:

What is the effect of psychoeducation on fear of childbirth?

What is the effect of psycho-education given during pregnancy on birth outcomes?

Material and Methods

Study Desing

A systematic review and meta-analysis of studies evaluating the effect of psycho-education on primiparous women on FOC and postpartum outcomes was performed. In the preparation of the systematic review and meta-analysis, the guidelines in the Cochrane Interventions Manual of Systematic Reviews and Preferred Reporting Items for Systematic Reviews and Meta-Analysis guidelines (PRISMA) were based on the recommendations of the guidelines followed. The protocol of this systematic review and meta-analysis was registered in the PROSPERO database (Prospero registration number: CRD42022379561). In order to control the risk of bias during the study, literature review, article selection, data extraction, and quality evaluation of the included articles were performed independently by two researchers. In case of disagreement on any issue, all researchers came together for discussion and a final consensus. During the study, no situation requiring deviation from the protocol was encountered, and the study was concluded in accordance with the protocol entered in the PROSPERO database.

Eligibility Criteria

The following criteria (PICOS) were considered in the selection of the studies to be included in the research: Participant (P): Primiparous pregnant women with fear of childbirth. Primiparous pregnant women included in the study exhibited the following criteria for birth-related characteristics: (1) Pregnant women who had never given birth, (2) had no pregnancyrelated disability, (3) had no psychological problems.

Intervention (I): Methods related to psycho-education. The training includes the following criteria: (1) face-toface training on fear of childbirth, (2) online training on fear of childbirth, (3) counseling on fear of childbirth. Comparison (C): Routine maintenance. Results (0): Mode of delivery, reasons for fear of childbirth. Study design (S): Randomized controlled trials were included.

Studies examining antenatal or postnatal fear, studies reflecting pregnant women with psychological disorders, as well as articles using non-valid measurement tools, and traditional and systematic reviews were excluded.

Search strategy

Literature search for this systematic review was carried out between November and December 2022 using four electronic databases (PubMed, CINAHL, Scopus and WOS). Primiparous pregnant women were screened for tokophobia using medical topics or keywords. The keywords were: "tocophobia," OR "fear of childbirth," OR "fear of labor," OR"fear of birth," OR "childbirth related fear," OR "childbirth related anxiety," AND "nulliparous "OR " primiparuos" AND "education". The search strategy was modified according to the characteristics of each database. In addition, reviews of articles with systematic reference lists included and other previous systematic reviews were checked to reach further studies.

Selection of Studies and Data Extraction

After removing duplicate articles from different databases, two researchers (A.T and Z.N) independently conducted literature review, article selection, data extraction, and quality assessment of included articles to control the risk of bias during the study. The 2 independent reviewers first scanned the titles and abstracts to determine which studies met the inclusion and exclusion criteria. Studies marked with inclusion criteria but not clear from the title/abstract scan were reviewed for the full text, and when consensus was not reached, the researchers jointly evaluated the study. A data extraction tool developed by the researchers was used to obtain the research data. Two reviewers (A.T and Z.N.) obtained data on the place and year of study, year of publication, research design, sample size, psychoeducation, definition of fear of childbirth, causes of fear of childbirth, and its effect on women's health and birth preference with this data extraction tool (Table 1).

Evaluation of the methodological quality of studies

Quality of articles in randomized controlled trials, Version 2 of the Cochrane Risk-of-Bias tool (RoB-2) was used for randomized trials.

Data analysis

Meta-analysis was performed using Review Manager 5.4 (The Nordic Cochrane Center, Copenhagen, Denmark) for data analysis. Heterogeneity between studies was assessed using the Cochran's Q test and Higgins' I^2, and an I^2 greater than 50% was considered to indicate significant heterogeneity. Accordingly, random effect results are taken into account when I^2 is greater than 50%, and fixed effect results if it is less than the value. Odds ratio (OR) for categorical variables, mean difference (MD) and standardized mean difference (SMD) for continuous variables were calculated. The MD or SMD was appropriately pooled for continuous variables, with the corresponding 95% confidence interval (CI) as to whether the results were measured with the same scales. All tests were calculated from two-pronged tests, and a p value less than 0.05 was considered statistically significant.

Risk of Bias

It was independently conducted by an author (A.Y.K) using the Cochrane tool to assess the risk of bias for all selected articles. The criteria outlined in the Cochrane Handbook for Systematic Reviews of Interventions; classified into six areas: ((random sequencing (selection bias), allocation concealment (selection bias), blinding of participants and staff (performance bias), blinding of outcome assessment (detection bias), handling of missing outcome data (attrition bias), selective outcome reporting (reporting bias) and other potential sources of bias (conflict of interest and funding sources).

The risk of bias for each domain was classified as "bias risk", "high risk" or "uncertain risk" according to the decision criteria in the "bias risk" assessment tool.

Results

Search Result

The PRISMA flowchart for scanning and selecting the literature is summarized in Figure 1. Electronic database search and manual search found 5317 articles. After repeated recordings, 5300 articles were evaluated. Headings and abstracts were read to identify relevant articles, and 5261 articles were omitted for review articles, protocols, duplications, different populations, and not meeting inclusion criteria. The remaining 44 full texts were evaluated for eligibility. Eight articles (16-23) that were RCTs were included in the analysis because they met the required criteria (Figure 1).

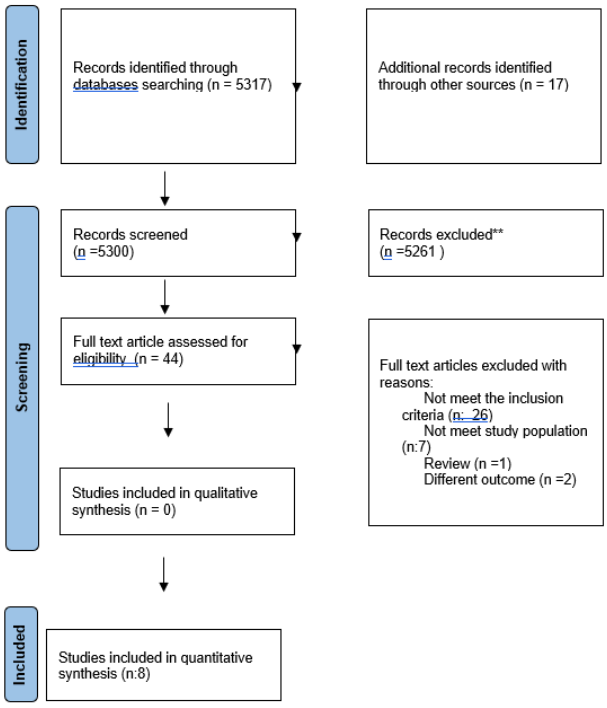

Figure 1. PRISMA flow diagram.
PRISMA: Preferred Reporting Items for Systematic Reviews and Meta-Analyses

Study characteristics

This systematic review and meta-analysis included eight studies conducted in six countries, involving a total of 1419 primiparous pregnant women for fear of childbirth (FOC); Finland (16), Australia (17,18), Iran (19) and the Netherlands (20), SanFrancisco (21) and Turkiye (22,23). All studies included in this systematic review and meta-analysis comprised of women who did not give birth (16-23).

The design of all studies included in the meta-analysis is RCT (16-23). The characteristics of the studies are shown in Table 1. In all of the articles included in the study (except for the study of Rouhe et al), psycho-education for fear of childbirth started during pregnancy. In Rouhe's study, however, psycho-education started during pregnancy and continued until postpartum 6-8 weeks. The duration of interventions for the studies included in the review ranged from 2.5 days to 8 weeks. In most of the articles, routine prenatal care was given to pregnant women in the control group. Routine prenatal care programs in Finland (16), Australia (17,18), Iran (19) and the Netherlands (20), SanFrancisco (21) and Turkiye (22,23) are similar. Routine antenatal care in these countries includes confirmation of pregnancy at 6-8 weeks, ultrasonic imaging twice during pregnancy, and follow-ups ranging from 8 to 15 times until delivery. However, in one study, the control group received antenatal training (22). While all the groups in the

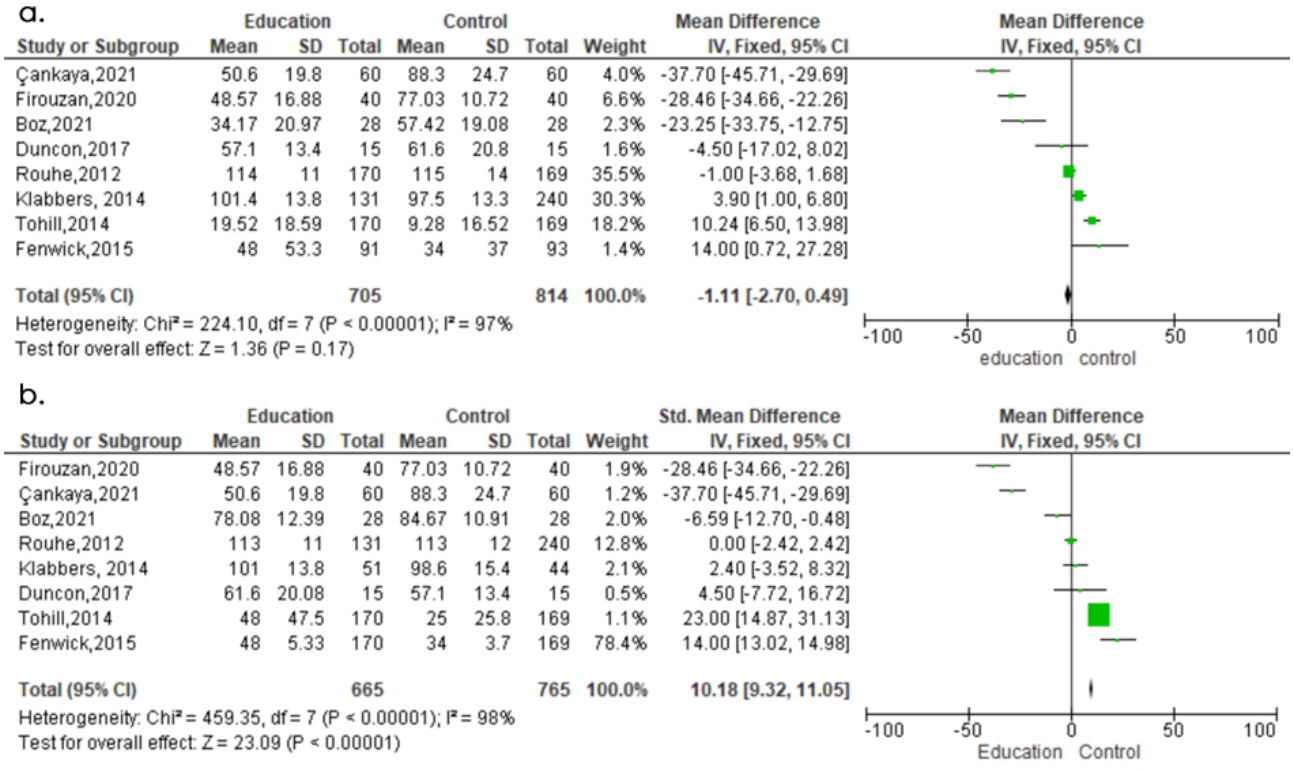

Figure2: Meta-analysis results on the effect of psycho-education on the fear of birth scale: (a) fear of birth, pre- psycho-education (b) fear of birth, post- psycho-education

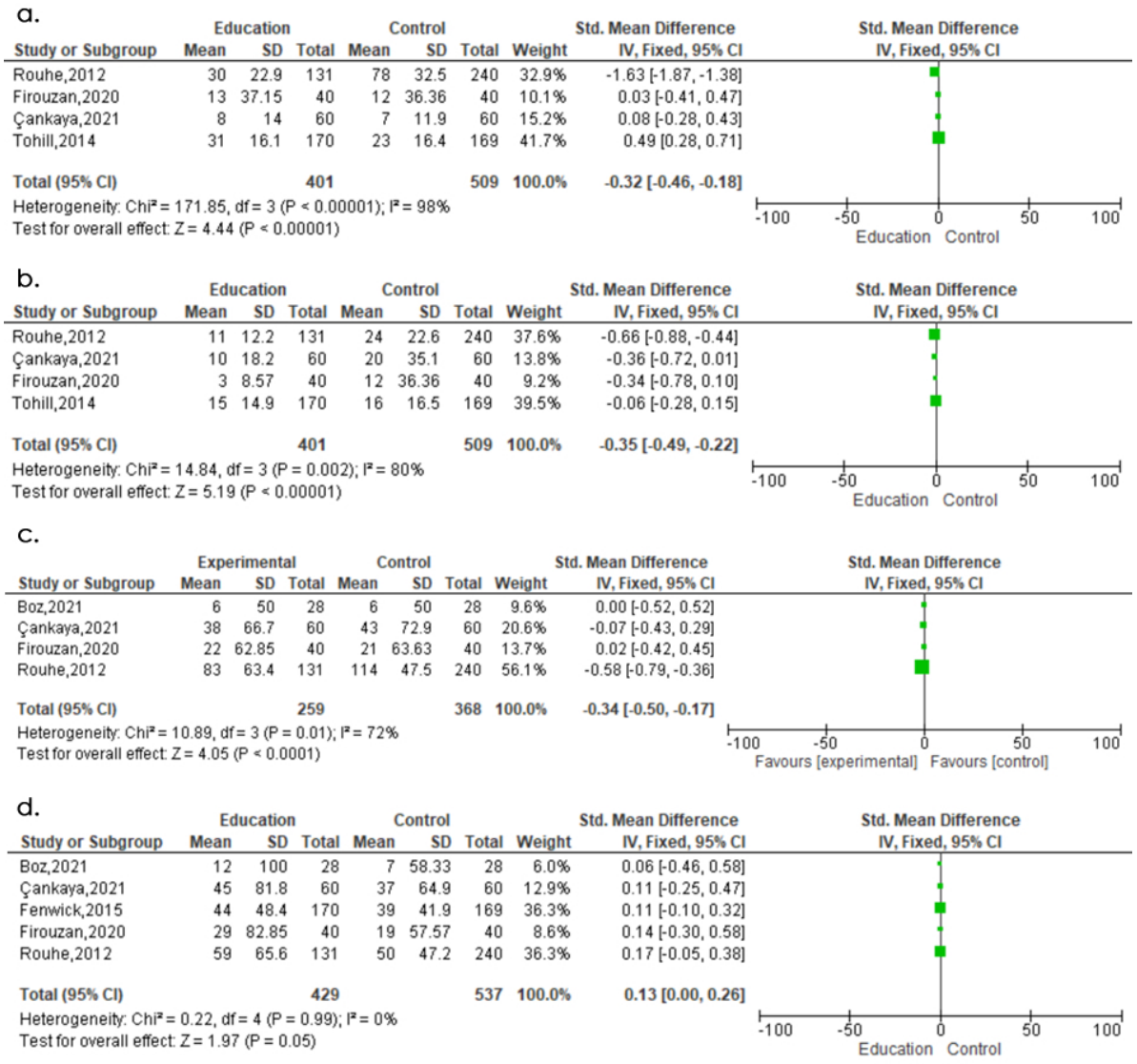

Figure3: Meta-analysis results on the effect of psycho-education on the birth preferences: (a) cesarean section, pre- psycho-education (b) cesarean section, post- psycho-education (c) vaginal birth, pre-psycho-education (d) vaginal birth post-psycho-education

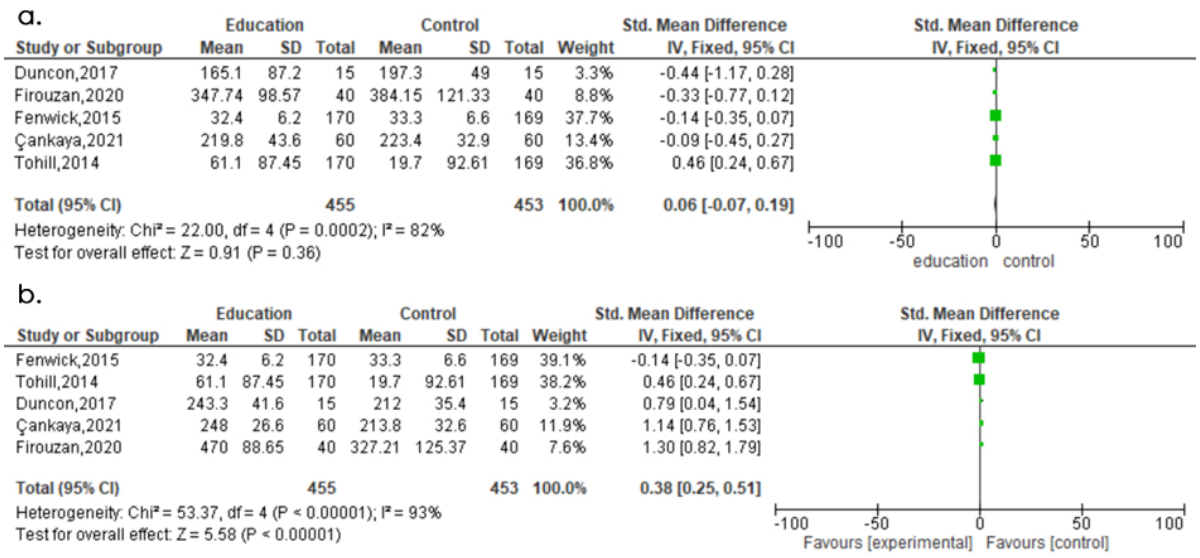

Figure 4: Meta-analysis results on the effect of psycho-education on the self-sufficiently scale: (a) self-sufficiently, pre- psycho-education (b) self-sufficiently, post- psycho-education

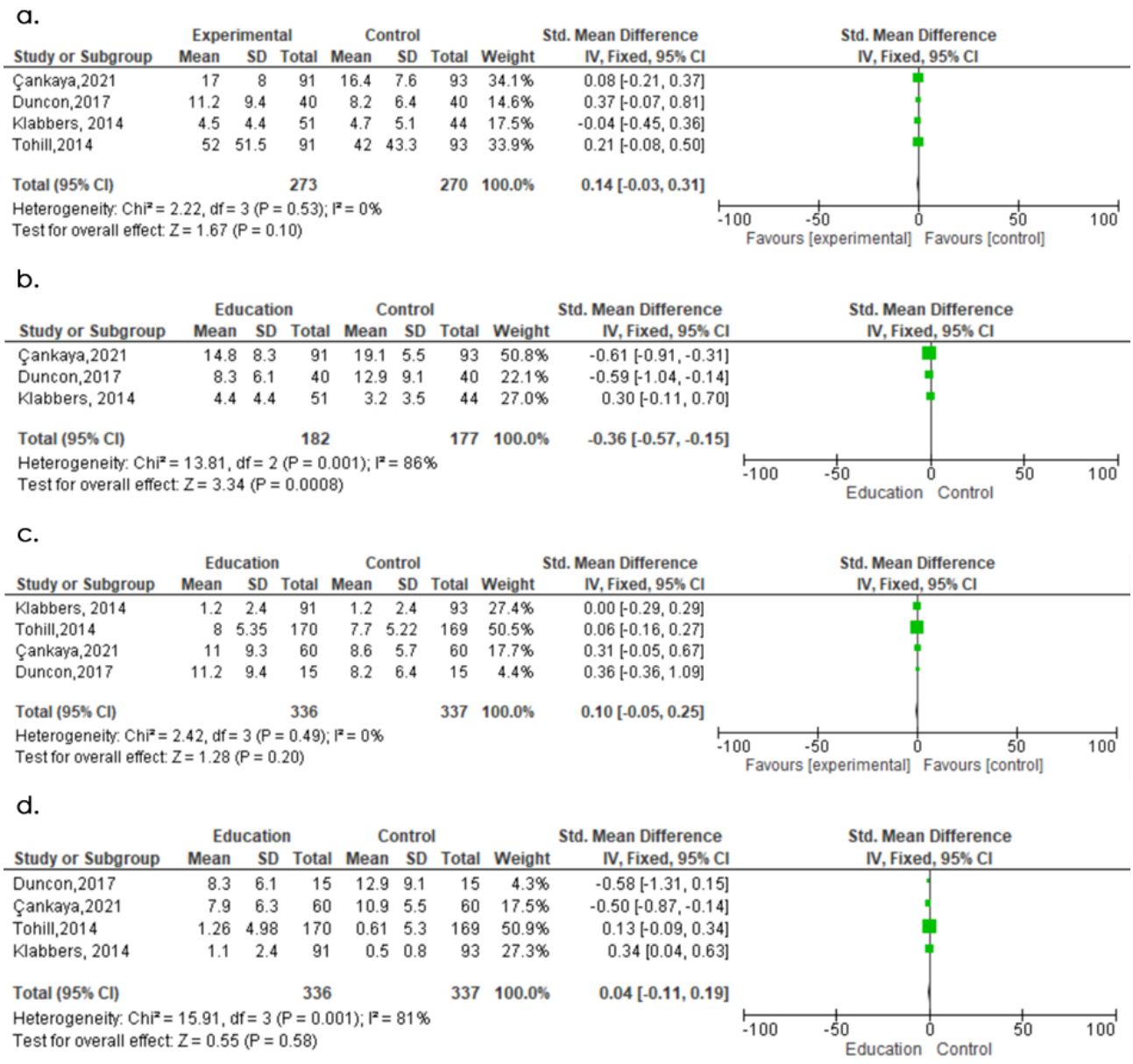

Figure 5: Meta-analysis results on the effect of psycho-education on the anxiety scale: (a) anxiety, pre- psycho-education (b) anxiety, post-psycho-education (c) depression, pre-psycho-education (d) depression, post-psycho-education

study were completed with 2 groups as intervention and control groups, in Kabbers (20)'s study, a third group was conducted as an internet-based psycho-education group.

Pregnant women in the intervention group received treatments for fear of childbirth that included the following psychoeducational models: Boz (2020) study; a psychoeducational model based on "Human Care Theory", Firouzan (2020) study; midwifery-led psychoeducational counseling model based on Gamble approach, Duncon (2017) study; Prenatal Education on Reducing Birth Stress (PEARLS) model, Klabbers (2017); Haptotherapy and internet-based psycho-education model, Fenwick (2015) and Tohil (2014) study; midwife-led psycho-education model by telephone, Çankaya (2020) and Rouhe (2012) study included the psycho-educational model. The entire pregnant population included women who would give birth for the first time (primipar). In all studies, FOC conditions were assessed as the primary outcome and by the Wijma Delivery Expectancy Questionnaire (W-DEQ-A). In all of the studies, the effect of psychoeducation on fear of childbirth was evaluated in both pregnancy and postpartum periods. In addition, four studies (16,19,22,23) included in the review reported results on the effect of fear of childbirth on pregnancy and postpartum birth preferences. Five studies (17-19,21,23) included in the review reported the effect of fear of childbirth on self-efficacy in the postpartum period. Four studies (16,20,21,23) included in the review reported the effect of fear of childbirth on anxiety and depression in the postpartum period.

Table 1. Characteristics and main findings of studies included in systematic review and meta-analyses

Tohill,2017, Australia	Klabbers, 2014, Holland	Duncon, 2017, San Francisco	**Author (reference)\Publication date\ Country**
May 2012 to June 2013	April 2012 to June 2015	2017	**Year of data collection**
RCT	RCT	RCT	**Study design**
339 primiparous woman 1- Psiko-education group; (n = 170), 2--control group; (n = 169)	134 primiparous woman 1-haptoterapi group; (n = 51), 2-internet-psiko eğitim grup (n: 39); 3-control group; (n = 44)	29 primiparous woman 1-Intervention group; (n = 30), 2-control group; (n = 29)	**Population**
Exclusion criteria: Women in their second trimester attending antenatal clinics of three hospitals in South East Queensland, Australia, able to communicate sufficiently in English, and aged 16 years or older were recruited by research assistants. Exclusion criteria: Women requiring an interpreter, younger than 16 years, or more than 24 weeks pregnant, and anticipating or experiencing a perinatal death (e.g., congenital abnormality incompatible) or stillbirth were excluded.	Inclusion criteria: Inclusion criteria for the intervention study were singleton pregnancy, age 18 years and a W-DEQ score 85, i.e., suffering from severe fear of childbirth. Exclusion criteria: Exclusion criteria were multiple pregnancies and a history of psychotic episodes.	Inclusion criteria: English-speaking nulliparous women with low-risk, healthy, singleton pregnancies in their third trimester planning a hospital delivery and wishing to be randomized Exclusion criteria: High-risk pregnancy, extensive experience with meditation or yoga practice, participation in other mind/body birth preparation courses	**The inclusion and exclusions criteria**
Education group: Psychoeducatio: Between 24-36 gestational weeks / by midwives / by phone / 3-4 weeks apart / four sessions / 90 minutes / PRIME (Promoting Resilience in Mothers' Emotions) based Psychoeducation.	Education group: Psycho-education via the Internet consisted of eight modules (and a brief test) during a period of 8 weeks between gestational week 20 and 36, providing information about the normal course of pregnancy, labor and birth.	Psycho-education group: MIL is a brief intervention for pregnant women and their partners specifically designed to target labor-related fear and pain by teaching tailored mindfulness-based coping strategies. The MIL course is delivered by professionally certified MBCP instructors and it is held over one weekend (Friday evening and all day Saturday and Sunday) for a total of 18 h of mindfulness training. Mindfulness strategies for coping with labor-related pain and fear are taught through interactive, experiential activities, with periods of didactic instruction.	**Psycho-education protocol**
Control Group: Usual care offered by publicly funded maternity services in Australia	Control Group: Care as usual was conducted according to the standards of the Royal Dutch Organization of Midwives (KNOV) and the Dutch Organization of Obstetrics and Gynaecology (NVOG).	Control Group: treatment as usual (TAU) standard childbirth education Participants assigned to the TAU control condition were provided with a list of study-approved childbirth courses of comparable length and quality to the MIL intervention, but without any mindfulness meditation, mindful movement/yoga, or other core mind/body component (e.g., hypnosis).	**Comparisons**
- Psycho-education Counseling group (n=69) - Control group (n=72)	1-haptotherapy group; (n = 11), 2-internet-psycho-education group (n: 11); 3-control group; (n = 14) After the haptotherapy group, 11 pregnant women were transferred from the online education group and 14 pregnant women from the control group.	-Interventions group (n=3) -Control group (n=0)	**Drop out**
FOC	FOC	FOC	**First Outcome: Fear of childbirth (FOC)-Pain severity**
Birth Self-Efficacy	NO DATA	Birth self-efficacy	**Secand Outcome: Self-efficacy, satisfaction at birth**
Depression, Anxiety	Depression, Anxiety	Depression	**Third Outcome: Anksiyete ve depression**
Birth preference	No DATA.	NO DATA	**Outcomes: Birth preference**
Psycho-education by trained midwives was effective in reducing high childbirth fear levels and increasing childbirth confidence in pregnant women.	There was no statistically significant decrease in the fear scores of women who received psychoeducation compared to the control group.	Mindfulness training carefully tailored to address fear and pain of childbirth may lead to important maternal mental health benefits, including improvements in childbirth-related appraisals and the prevention of postpartum depression symptoms. There is also some indication that MIL participants may use mindfulness coping in lieu of systemic opioid pain medication. A large-scale RCT that captures real-time pain perceptions during labor and length of labor is warranted to provide a more definitive test of these effects.	**Suggestion**

Table 1. Characteristics and main findings of studies included in systematic review and meta-analyses

Firouzan,2020, Iranian	Çankaya,2021,Turkey	Fenwick,2015, Australia	**Author (reference)\ Publication date\ Country**
February 2019 to September 2019	April 2019 to September 2019	May 2012 to June 2013	**Year of data collection**
RCT	RCT	RCT	**Study design**
80 primiparous woman 1- Psiko-education group; (n = 40), 2- -control group; (n = 40)	120 primiparous woman 1-Antenetal education group; (n = 60), 2- -control group; (n = 60)	339 primiparous woman 1- Psiko-education group; (n = 170), 2- -control group; (n = 169)	**Population**
Inclusion criteria First-time pregnant women who were between 18 to 35years old, could speak and read Persian, had a single fetus, and scored 66 or above on the Wijma delivery expectancy/experience questionnaire (W-DEQ) were selected to participate in the study. Exclusion criteria:Those who had any history of infertility, and mental or physical chronic diseases were excluded.	Inclusion criteria: Nulliparous women older than 18years of age with a healthy singleton pregnancy in 20 and 32weeks of gestation were included. Participation criteria also include childbirth at full term, having a healthy newborn (born at 38–42weeks), and not participating in another prenatal program. Exclusion criteria included: Women who use medications for a diagnosed mental disorder (e.g., antidepressants, antianxiety, or antipsychotic drugs), those with complicated/high-risk pregnancies, experiencing a perinatal death (e.g.,congenital abnormalities incompatible life) or stillbirth, or postpartum complications (bleeding, puerperal infection, mastitis, thromboembolic disease, or postpartum psychiatric disorder) were excluded.	Inclusion criteria: Women between 12 to 24 weeks gestation, aged 16 years and older, able to read, write and understand English and with capacity to consent were invited to participate. Exclusion criteria: Women who required an interpreter, or had a fetal diagnosis of major abnormality or incompatibility with life were excluded.	**The inclusion and exclusions criteria**
Education group: The first author gave two face-to-face counseling sessions in the 24th and 34th weeks of pregnancy to the participants in intervention group (she is a midwife). Between these two sessions, the intervention group received eight telephone-counseling sessions once a week. We used the BELIEF approach which is a telephone counseling psychoeducational approach offered by midwives	Education group: Antenetal education group: The primiparous pregnant women selected for the antenatal education group participated in education classes in groups of 8–10 people. Pregnant women were given structured antenatal education twice a week for 2weeks (240min). The total education time was 16 hr. Each session comprised 150min presentation of theoretical knowledge, 45min warm-up and stretching exercises, and 45min relaxation exercises.	Education group: Psychoeducation: Women in the BELIEF intervention group received psycho-education sessions at 24 and 34 weeks gestation by telephone at a scheduled time convenient to them. Psycho-education sessions were around 1 hour duration (First session range: 22–125 min; Second session range: 10–104 min)	**Psycho-education protocol**
Control group.: Control group only received the prenatal routine care.	Control group.: Control group did not receive antenatal education and they received prenatal care service routinely provided at the polyclinics of the same hospital.	Control Group: Received usual maternity care at their chosen facility.	**Comparisons**
- Psiko-education Counseling group (n=5) - Control group (n=7)	- Psiko-education Counseling group (n=5) - Control group (n=3)	- Psycho-education Counseling group (n=69) - Control group (n=76)	**Drop out**
FOC	FOC	FOC	**First Outcome: Fear of childbirth (FOC)-Pain severity**
Birth Self-Efficacy	Birth Self-Efficacy	Parenting confidence	**Secand Outcome: Self-efficacy, satisfaction at birth**
NO DATA	Depression, Anxiety	Depression, Anxiety	**Third Outcome: Anksiyete ve depression**
Birth preference	Birth preference	Birth preference	**Outcomes: Birth preference**
The intervention group showed significantly more reduction in childbirth fear and more increase in childbirth self-efficacy compared to the control group. In addition, more women in the intervention group reported that they preferred to give normal vaginal birth than women in the control group. The BELIEF protocol could be an effective approach in reducing childbirth fear and increasing childbirth self-efficacy among first-time pregnant women who are afraid of giving birth.	It was found that those in the antenatal education group had less birth fear, depression, anxiety, and stress symptoms and increased childbirth self-efficacy compared to controls. Those in the antenatal education group had significantly lower postnatal birth fear, depression, anxiety, and stress symptoms compared to controls. More vaginal births occurred in the antenatal education group compared to controls. According to the outcome of this evidence-based study: antenatal education has important clinical benefits for women both during pregnancy and in the postpartum period and all pregnant women should receive this education.	Compared to controls the intervention group had a clinically meaningful but not statistically significant reduction in overall caesarean section and emergency CS rates. Fewer women in the intervention group preferred caesarean section for a future pregnancy.	**Suggestion**

Table 1. Characteristics and main findings of studies included in systematic review and meta-analyses

Author (reference)\ Publication date\ Country	Çankaya,2020, Turkey	Rouhe,2012, Finland	Boz,2021,Turkey
Year of data collection	Temmuz 2018 ile Nisan 2019	October 2007 to August 2009	July 2018 to October 2018
Study design	RCT	RCT	RCT
Population	120 primiparous woman 1- Health literacy group; (n = 70), 2-Antenatal education (n=70) 3-control group; (n = 80)	371 primiparous woman 1- Psiko-education group; (n = 131), 2- -control group; (n = 240)	56 primiparous woman 1- Psiko-education group; (n = 28), 2- -control group; (n = 28)
The inclusion and exclusions criteria	Inclusion criteria: Nulliparous women older than 18years of age with a healthy singleton pregnancy in 20 and 32weeks of gestation were included. Participation criteria also include childbirth at full term, having a healthy newborn (born at 38–42weeks), and not participating in another prenatal program. Exclusion criteria: Women who use medications for a diagnosed mental disorder (e.g., antidepressants, antianxiety, or antipsychotic drugs), those with complicated/ high-risk pregnancies, experiencing a perinatal death (e.g.,congenital abnormalities incompatible life) or stillbirth, or postpartum complications (bleeding, puerperal infection, mastitis, thromboembolic disease, or postpartum psychiatric disorder) were excluded. All participants were also required to be primary school graduates and able to communicate in Turkish. Partners/friends who will support at birth were invited to participate.	Inclusion criteria: Nulliparous women whose W-DEQ-A score was above the 95th percentile (W-DEQ-A sum score ‡100) Exclusion criteria were manifest psychosis and severe depression.	Inclusion criteria were: age between 18 and 45 years old, the 20th or later gestational weeks, at least moderate level of the FOC in terms of Wijma Delivery Expectancy/Experience Questionnaire A, and could speak and understand Turkish without any communication barrier. Exclusion criteria were: 1st and 3rd trimesters of pregnancy, a high-risk pregnancy, contraindication at physical activity, a communication barrier, and multiparity.
Psycho-education protocol	Education group: The content of the antenatal education class is presented in Table 1. Its content and structure are based on Dick-Read's "natural birth", Lamaze's "psychoprophylaxis", Balaskas's "active birth", and Mongan's "hypnobirthing" philosophy. The sessions in the training group were held using simulator models, animation videos, role-playing, creative drama, and slide presentations. The primiparous pregnant women selected for the antenatal education group participated in education classes in groups of 8–10 people. Pregnant women were given structured antenatal education twice a week for 2weeks (240min). The total education time was 16 hr. Each session comprised 150min presentation of theoretical knowledge, 45min warm-up and stretching exercises, and 45min relaxation exercises.	Education group Psikoeğitimi: In this study, the intervention method of treating these women with severe fear of childbirth was psychoeducative group therapy led by four different psychologists with special group therapeutic skills in pregnancy-related issues. The starting point of group therapy was planned to be at approximately the 26th week of pregnancy. Six group sessions were held during pregnancy and one session with the newborns 6–8 weeks after delivery. Each 2-hour session had a certain structure: a focused topic and a 30-minute guided relaxation exercise using a compact audio disk developed for this purpose. This relaxation exercise guided the participants through stages of imaginary delivery in a relaxed state of mind with positive, calming and supportive suggestions.	Education group: Psychoeducation group: The program was administered by two nurses (Xa, Xb) in the form of psychoeducation groups consisting of 4–6 women. The psychoeducation program was carried biweekly in five sessions, each session lasting 120 min on average.
Comparisons	Control group: Control group did not receive antenatal education and they received prenatal care service routinely provided at the polyclinics of the same hospital.	Control group.: Those randomised to the control group received a letter in which they were recommended to discuss their fear of childbirth in their primary healthcare maternity unit.	Control group.: Antenetal education group: The antenatal education was carried out once a week in four sessions, each session lasting 150 min on average, in the form of group education consisting of 4–6 women, who were in the second trimester of pregnancy. Content of the training: Anatomy and physiology of the reproductive system, Physiological and psychological changes during pregnancy and development of the fetus, Labor and management, Postpartum period and newborn care
Drop out	1- Health literacy group; (n = 17), 2-Antenatal education (n=14) 3-control group; (n = 7)	-psychoeducative group therapy: (n=41) -Control group (n=131)	- Psiko-education Counseling group (n=16) - Control group (n=16)
First Outcome: Fear of childbirth (FOC)-Pain severity	FOC	FOC	FOC
Secand Outcome: Self-efficacy, satisfaction at birth	Self-Efficacy	Self confidences	NO DATA
Third Outcome: Anksiyete ve depression	Depression, Anxiety	NO DATA	NO DATA
Outcomes: Birth preference	NOTE	Birth preference	Birth preference
Suggestion	It was determined that the prenatal education group had less fear of birth, depression, anxiety and stress symptoms and increased birth self-efficacy compared to the controls.	To decrease the number of CSs, appropriate treatment for fear of childbirth is important. This study shows positive effects of psychoeducative group therapy in nulliparous women with severe fear of childbirth in terms of fewer CSs and more satisfactory delivery experiences relative to control women with a similar severe fear of childbirth.	Although the levels of FOC of the women decreased in both groups for post-treatment, the decrease in the psychoeducation group was significantly higher compared to the antenatal education group. In the postnatal period, the level of FOC of psychoeducation group was statistically lower than that of the antenatal education group. There seems to be an indication that the psychoeducation program based on Human Caring Theory might have a benefit to reduce the level of FOC of women compared to the antenatal education classes.

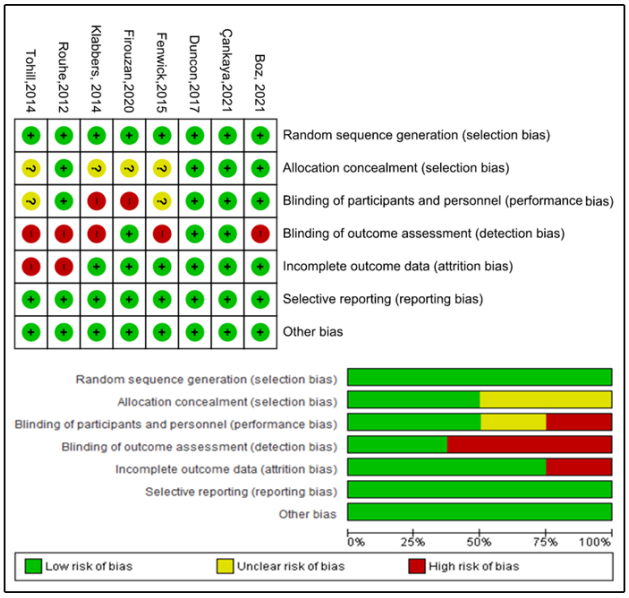

Figure 6. Risk of bias domains: ROB-2
ROB-2: Risk-of-Bias tool for randomized trials.

Outcomes

First Outcome

Figure 2, the effect of psycho-education on fear of childbirth is presented in a forest plot (Forest Pilot) of the meta-analysis. In all studies, W-DEQ-A (Wijma Delivery Expectancy Questionnaire) and W-DEQ-B (Wijma Delivery Experience Questionnaire) were used to assess fear of childbirth. Figure 3, the effect of psycho-education on birth preferences is presented in a forest plot of the meta-analysis. Four of the studies reported results on cesarean and vaginal birth preferences before and after psycho-education

The effect of psycho-education on fear of childbirth

The effect of psycho-education on fear of childbirth. In all the studies (16-23) reviewed, the authors reported results on the effect of psycho-education on fear of childbirth. The mean pooled results of the studies show that there is no significant difference between the groups in the pre-psycho-education al period of fear of childbirth (MD: -1.11 95% CI: -2.70 to 0.49, Z = 1.36, p: 0.17). When the fear of childbirth was examined in the post-training period, the pooled results of the studies showed that there was a significant difference between the groups (MD: 10.18 95% CI: 9.32 to 11.05, Z = 23.09, p < 0.00001) (Figure 2a–b).

The effect of psycho-education on birth preferences

The effect of fear of birth on delivery preferences. In the four studies reviewed, the authors reported the effects of fear of childbirth on cesarean and vaginal birth preferences in the pre- and post-psycho-education al period. The standardized pooled results of the studies showed that there was a significant difference between the groups in the effect of fear of childbirth on cesarean section preferences in the pre-psycho-education period (SMD: -0.32 95% CI: -0.46 to -0.18, Z = 4.44, p<0.000001). When we look at the post-training period, the standardized pooled results of the studies show that there is a significant difference between the groups in the cesarean section preferences, one of the birth preferences (SMD: -0.35 95% CI: -0.49 to -0.22, Z = 5.19, p<0.00001). In four studies reviewed, the authors reported results on vaginal birth preferences of fear of childbirth in the pre-training period and in five studies post-psycho-education. The standardized pooled results of the studies showed that there was a significant difference between the groups in terms of vaginal birth preferences in the pre-psycho-education period (SMD: -0.34 95% CI: -0.50 to -0.17, Z = 4.05, p<0.0001). Considering the status of vaginal birth preference in the post-training period, the standardized pooled results of the studies show that there is a significant difference between the groups (SMD: 0.13 95% CI: 0.00 to 0.17, Z = 1.97, p=0.05). (Figure 3a–b-c-d).

Second outcome

Figure 4, the effect of training on self-efficacy is presented in a forest plot (Forest Pilot) of the meta-analysis. In studies, Sense of Confidence and Satisfaction Scale (23), Childbirth Self-Efficacy Inventory (CBSEI) (16,19, 21); Parenting confidence Mean (18) was used.

The effect of psycho-education on Self-efficacy

The effect of psycho-education on self-efficacy. In five studies (16,18,19,21,23) reviewed, the authors reported results on self-efficacy scores in the pre- and post-psycho-education period. The pooled results of the studies showed that the effect of fear of childbirth on self-efficacy in the pre-psycho-education period did not differ significantly between the groups (SMD: 0.06 95% CI: −0.07 to 0.19, Z = 0.91, p = 0.36). When the post-training self-efficacy scores were evaluated, the average pooled results of the studies showed that the effect of psycho-education on the self-efficacy scores was a significant difference between the groups (SMD: 0.38 95% CI:0.25 to 0.51, Z =5.58 p <0.00001)) (Figure 4a–b).

The effect of psycho-education on anxiety and depression

Figure 5, the effect of psycho-education on depression and anxiety is presented in a forest plot (Forest Pilot) of the meta-analysis. In studies, Edinburgh Postnatal Depression Scale (EPDS) (16, 18), DASS-21 (23); Center for Epidemiologic Studies Depression Scale (CES-D) (21) was used.

The effect of psycho-education on anxiety and depression. In four studies (16, 20, 21, 23) reviewed, the authors reported results on anxiety in the pre-psycho-education period and three studies in the post-psycho-education period. The standardized pooled results of the studies showed that there was no significant difference between the anxiety groups in the pre-psycho-education period (SMD: 0.14 95% CI: -0.03to 0.31, Z = 1.67, p=0.10). When we look at the post-training period, the standardized pooled results of the studies show that there is a significant difference

between the groups (SMD: -0.36 95% CI: -0.57 to -0.15, Z = 3.34, p=0.0008). In the four studies reviewed, the authors reported results on depression in the pre- and post-psycho-education period. The standardized pooled results of the studies showed that there was no significant difference between the depression groups in the pre-psycho-education period (SMD: 0.10 95% CI: -0.05 to 0.25, Z = 1.28, p=0.20). When we look at the situation of depression in the post-psycho-education period, the standardized pooled results of the studies show that there is no significant difference between the groups (SMD: 0.04 95% CI: -0.11 to 0.19, Z = 0.55, p=0.58). (Figure 5a–b-c-d).

Risk of Bias Assessment

All studies have identified an adequate method for randomly assigning participants to psycho-education groups (16-23) (Figure 6). Therefore, we evaluated these studies in this area as having a low risk of bias. Four studies reported adequate allocation confidentiality using sequentially numbered and sealed opaque envelopes and rated them at low risk of bias (16,21-23). Two studies were considered as a risk of uncertainty bias due to insufficient information on randomization or allocation confidentiality or no mention of factors (16,18-20). Three studies included in the meta-analysis were assessed at risk of bias in this area when informing experiment participants and researchers to be blinded to the study (16,21,22). In the other five studies, participants and researchers were not able to be blinded to the study, so all studies were evaluated at risk of bias in blinding participants and staff, and this was taken into account when interpreting the findings (16,18,19,21,23). Three studies are at low risk of blinding outcome evaluation (16,19,21). Other studies have also been evaluated without blinding the outcome assessment and with a high risk of bias (16-18,20,22). Three studies (16,17,20) did not explain the high attrition rates with dropout rates, and when the dropout rates were calculated for the four trials, dropout rates were higher than 20%. Therefore, the risk of bias was considered high. We concluded that the other five studies had a low risk of attrition. Because in these five studies, dropouts were balanced between the intervention and control groups, or there were too few dropouts to affect the study (18,19,21-23). All studies included in the meta-analysis were considered at low risk of reporting bias, as they discussed significant results reported in all study methods, including negative outcomes, and matched those reported in their registry. For each included study, we described significant concerns regarding other possible sources of bias that were not previously addressed in the above categories. Specifically, we looked for a conflict-of-interest statement and a source of funding. None of the included studies reported any other risk of bias (16-23).

Discussion

In this systematic review and meta-analysis study, it is aimed to present the evidence on the effect of psycho-education on the fear of childbirth, one of the most important problems experienced by women. In the study, we found that the psycho-education applied to pregnant women with fear of childbirth reduces the rates of fear of childbirth decreases the cesarean section preferences that may be caused by the fear of childbirth, and affects self-confidence and self-efficacy. We found that psycho-education had a positive effect on fear of birth, mode of birth, self-efficacy, and self-confidence. Our results are important in terms of showing that psycho-education al methods can be used in the management of fear of childbirth in pregnant women.

Discussion of Primary Results

The effect of psycho-education on fear of childbirth

In our meta-analysis, when the effect of training applied to pregnant women who have fear of childbirth to reduce fear of birth was compared with routine care, it was seen that psycho-education reduced fear of childbirth. Antenatal training is one of the most important practices to prevent or treat fear of childbirth. Studies have shown that psycho-education given to women who have fear of childbirth during the antenatal period is effective in reducing the fear of childbirth (16,24). Psycho-education is a method that midwives can easily add to their antenatal care (18). Toohill et al. (17) reported that psycho-education based on PRIME (Promoting Resilience in Mothers' Emotions), which consists of 4 sessions of 90 minutes with 3-4 weeks intervals, significantly reduced women's FOC. In the study of Çankaya et al. (23) with 120 primiparous women in Turkiye, it was found that the psycho-education provided relieved women's fear of childbirth. Despite the studies on psycho-education to reduce women's fear of childbirth, there are also studies that have no effect on fear of childbirth (20,21). This difference is thought to be due to cultural difference.

The effect of psycho-education on birth preferences

The negative effects of high cesarean rates on maternal and child health are one of the primary problems both in the world and in Türkiye. Although the World Health Organization (WHO) predicts ideal cesarean rate to be between 10-15%, cesarean rate is increasing in the world (25). Supportive care provided to pregnant women before and during delivery may play a role in reducing unnecessary cesarean section rates (26). In our meta-analysis, when the training applied to pregnant women with fear of childbirth was compared with routine care, it was seen that psycho-education increased vaginal delivery by decreasing cesarean rates. Studies show that antenatal psycho-education increases the rates of vaginal birth, decreases the rates of elective and repeated cesarean section in women who have fear of childbirth, and that fewer women will prefer cesarean section again in the next delivery (16-18,22). In the study of Firouzan et al. (19) with 80 primiparas, it was observed that psycho-education prepared according to the BELIEF protocol given to women with fear of childbirth decreased the rate of cesarean section and increased the rate of vaginal delivery.

In another study, it was determined that psycho-education, consisting of 5 sessions of 120 minutes, reduced the rates of cesarean section of women with fear of childbirth (22). Studies in the literature emphasize that psycho-education al interventions increase vaginal delivery rates, and the findings are similar. Application of psycho-education as routine midwifery care to women experiencing FOC will have a positive effect on both their cognitive and behavioral adjustments, and this may result in an increase in women's preference for vaginal delivery, resulting in a significant decrease in cesarean section rates.

Discussion of Secondary Results

The effect of psycho-education on self-efficacy

The act of giving birth is directly related to the concept of self-efficacy, that is, the woman's self-confidence and her belief that she can give birth in a healthy way. The self-efficacy perception of the pregnant towards childbirth can negatively affect the fear of childbirth, and the fear of birth may adversely affect the entire birth process (27-29). Our meta-analysis found that training applied to pregnant women with fear of childbirth increased the perception of self-efficacy of women in the postpartum period when compared with routine care. In the United States, The Mind in Labor (MIL)(1) guides women to reframe labor pain; 2) women are taught how to separate the sensory component of pain from the cognitive and emotional components in order to reduce fear of the physical pain of childbirth; 3) women learn how to become more aware of their own bodies and their fearful responses to pain by practicing coping with pain; 4) women and their spouses develop personalized strategies to best cope interpersonally and provide support to each other throughout the birth process. It was found that the training provided under the program was effective in reducing women's fear of childbirth and providing more childbirth-related self-efficacy compared to standard birth preparation training (21). However, in a similar study conducted in Türkiye, it was determined that psycho-education increased the self-efficacy of women regarding childbirth (23).

The effect of psycho-education on anxiety and depression

Birth is a complex life event that can be associated with both positive and negative psychological responses. Our meta-analysis found that the effect of training on pregnant women with fear of childbirth on anxiety and depression in the postpartum period, compared to routine care, reduced the rates of anxiety and depression. It has been shown that psycho-education is widely used in the treatment of anxiety and depression and generally provides improvement (16-18,21,23). Studies have shown that antenatal psycho-education given to women with fear of childbirth reduces postnatal depressive symptoms (16). However, in the study of Fenwick et al. (18), it was reported that antenatal psycho-education given to women with fear of childbirth was not effective on postnatal depressive symptoms. The findings are similar to the literature. Because psycho-education is thought to be effective in reducing postpartum depression by strengthening coping mechanisms.

Strengths and limitations

The strengths of the study are that most of the participants were obtained from studies conducted in countries with different income levels, with groups with various advantages and disadvantages. The other strength is that it demonstrates the effect of low-cost psycho-educational intervention to reduce fear of birth, cesarean rates, postpartum anxiety and increase self-efficacy, which are the biggest reasons for the increase in cesarean rates. Other strengths are the scanning of multiple databases, the fact that multiple researchers involved in the data extraction process are blinded to each other, and provide a low margin of bias and error. Additionally, the methodological quality of the included studies is agreed upon after an independent evaluation by each researcher.

One of the limitations is that only studies published in English or Turkish are taken into account. Another limitation was high heterogeneity despite subgroup analyzes. This can be explained by the diversity in the intensity, form, mode and timing of interventions.

Conclusion

It is known that FOC negatively affects prenatal, birth and postpartum processes. The fear of birth experienced in the process is a concept based on perception. Mood changes experienced by women at birth differ among women. This situation and its consequences have been ignored by health professionals for many years. However, in recent years, many women have begun to see the birth experience at the center of maternal psychosocial health. In this systematic review and meta-analysis, (1) the effect of the training group in reducing fear of childbirth was found more effective than routine care; (2) it has been found that while fear of birth increases cesarean section preferences by affecting birth preferences, psycho-education given during pregnancy decreases cesarean section preferences and increases vaginal delivery; (3) it was found that while fear of childbirth negatively affects self-efficacy and self-confidence levels in the postpartum period, psycho-education given during pregnancy increases self-efficacy and self-confidence levels; (4) It was found that psycho-education given during pregnancy reduced the anxiety caused by the fear of childbirth.

The results of this study show that midwives and health professionals can use psycho-education as a safe method in the follow-up and care of pregnant women who have fear of childbirth in the pregnancy and postpartum period, and thus contribute to the improvement of care services by reducing the risks caused by fear of childbirth. Studies show that psycho-education given to women who have fear of childbirth increases the positive birth experience. Therefore, it is important to effectively manage women's FOC. The management of the process should start from the

antenatal period.

Ethical Declarations

Ethical approval

As this is a systematic review, it cannot be applied.

Conflict of interest statement

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Authorship Contributions

Study design: AYK, AT, ZN. Data collection: AYK, AT, ZN. Data analysis: AYK, AT, ZN. Study supervision: AYK. Article writing: AYK, AT, ZN. Critical revisions for important intellectual content: AYK. All authors have read and approved the final manuscript.

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