Maternal Health, Neonatology, and Perinatology

REVIEW

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The effect of mode of delivery on postpartum comfort level and breastfeeding self-efficacy: a systematic review and meta-analysis

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Abstract

Objective This study was conducted to determine the effect of the mode of delivery on maternal postpartum comfort level and breastfeeding self-efficacy.

Methods The study was conducted as a systematic review and a meta-analysis. Searching was performed from March to July 2022, on PubMed, National Thesis Center, Dergi Park, Google Scholar, Web of Science, and EBSCO search engines and we included studies from the last 10 years. The Joanna Briggs Institute Critical Appraisal tools used in cross-sectional studies were employed to appraise the methodological quality and performed meta-analyses using a random-effects model for all outcomes. Study data consisted of continuous variables calculated by Mean Difference.

Results From 3732 records received, 21 cross-sectional studies involving 5266 participants were determined to be eligible. Meta-analysis results showed that cesarean section reduced postpartum comfort, albeit not statistically significant (MD: -0.87 95%: -1.98–0.24, Z = 1.53, $p = 0.44$), whereas the combined results of breastfeeding self-efficacy showed that delivery type did not affect breastfeeding self-efficacy.

Conclusion The results of this review have clinical implications for postpartum caregivers, as the effects of mode of delivery on postpartum comfort and breastfeeding self-efficacy have been well documented in previous studies. The authors recommend caregivers plan maternal care to increase their comfort, taking into account the factors that may affect postpartum comfort in the light of evidence-based practices.

Keywords Breastfeeding self-efficacy, Cesarean delivery, Meta-analysis, Postpartum comfort, Vaginal delivery

Introduction

Childbirth is one of the most critical stages in a woman's life and often marks the transition to a new life [1]. One of the essential factors affecting the healthy progress of this shift is delivery type, which can depend on maternal obstetric characteristics, individual preferences, and advice from family, friends, or the doctor [2]. Mode of delivery, i.e., vaginal or cesarean delivery, is an essential factor affecting the birth and postpartum period. With proper guidance during labor, the most physiologically appropriate mode of delivery for the female body is vaginal delivery. Nevertheless, cesarean delivery is performed in cases where work does not progress as it should, hence putting the mother and the fetus at risk [2, 3]. Whether by Cesarean section

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or vaginal birth, postpartum is the beginning of a new period in the interaction between mother and infant. It comes with a series of psychosocial changes, adapting to which can create considerable anxiety and stress. Providing comfort to the mother is very important in facilitating her adaptation to this new period of life [4].

Kolcaba developed her comfort theory in 2003, which defined comfort as 'the immediate experience of being strengthened through having the needs for relief, ease, or transcendence met in four contexts: environmental, social, psycho-spiritual and physical [5]. Postpartum comfort is essential for women to pinpoint and solve the problems they face during that period [6]. Midwives play a crucial role in solving the factors affecting postpartum comfort and helping mothers adapt to the postpartum period. Comfort-oriented care by midwives contributes to the individual's quality of life and promotes quick mother-infant bonding, postpartum care, and satisfaction [7].

Quick mother-infant bonding can be facilitated through comfort and mode of delivery. A critical factor in mother-infant adhesion and the formation of a healthy society is breastfeeding [8]. According to UNICEF (UN International Children's Emergency Fund), breastfeeding gives all children the most nutritious start. It leads to lower healthcare costs, healthier families, and a more competent workforce [9]. To promote breastfeeding, WHO (World Health Organization) notes that breastfeeding acts as a baby's first vaccine after birth and recommends that babies be exclusively breastfed for the first six months of life and continue to be breastfed for up to 2 years and beyond [10]. Many factors such as the mother's age, education, employment and economic status, smoking, family structure, frequency of prenatal follow-up, breast milk and breastfeeding education, number of living children and births, skin-to-skin contact, postpartum depression, birth weight and birth type affects breastfeeding self-efficacy [6].

While, in general terms, the perception of self-efficacy plays a significant role in the activities that an individual will or will not do, the perception of breastfeeding self-efficacy is a mother's confidence in her ability to breastfeed her new infant and, above all, her interest and desire for breastfeeding. High breastfeeding self-efficacy has been positively associated with the duration and exclusivity of breastfeeding [11]. Mode of delivery and perception of breastfeeding self-efficacy affect postpartum breastfeeding [11, 12]. Some studies in the literature state those women who gave birth by cesarean delivery started breastfeeding later than those who had a vaginal delivery [13, 14]. No systematic review or meta-analysis on the subject was found in the literature review. This study, which will be carried out due to the gap in the literature, will contribute to the field.

Aim

This systematic review and meta-analysis study aimed to determine the effect of the mode of delivery on maternal postpartum comfort level and breastfeeding self-efficacy based on primary studies. The questions that the researchers sought to answer were:

1. How does the mode of delivery affect maternal postpartum comfort level?
2. How does the mode of delivery affect maternal breastfeeding self-efficacy level?

Methods

Protocol and registration

This study is a systematic review and meta-analysis, which was performed according to the standard guideline of "Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA)" [15]. This systematic review and meta-analysis protocol was registered in the PROSPERO database (Trial Registration Number: CRD42020191106; 26 May 2022). PRISMA (Preferred Reporting Items for Systematic Review and Meta-Analysis) protocols were followed for review and reporting [15].

Search strategy

Data base (www.crd.york.ac.uk/prospero) was explored to confirm whether systematic review or meta-analysis existed before. Two researchers, independently between March and July 2022 on PubMed, National Thesis Center, Dergi Park, Google Scholar, Medline, Web of Science, and EBSCO search engines, conducted searching within the scope of this systematic review and meta-analysis. The search was carried out using the following keywords or medical subject headings: "mode of delivery" AND "cesarean section" OR "cesarean delivery" AND "vaginal birth" OR "vaginal delivery" AND "postpartum comfort" AND "breastfeeding self-efficacy". In addition, additional studies were independently checked against included articles by the other two authors. Using the snowball method, reference lists of included studies and previous systematic reviews were checked for additional studies. To eliminate the risk of bias in the study, two researchers searched, screened, extracted data, and appraised the articles included independently. The researchers discussed and resolved any differences of opinion arising on any aspect of the study. For discrepancies, we screened with the help of a third reviewer. Before starting the study, a pilot study was conducted with the participation of all authors agreeing on a joint roadmap, including

all stages of research. We used Cohen kappa (K = 0.9) to assess inter–rater agreement.

Inclusion and exclusion criteria

The criteria for the studies to be included in this review were as follows:

1. Participant groups included mothers' mode of delivery, postpartum comfort levels, and breastfeeding self-efficacy levels.
2. Attention was paid to the fact that the studies were full-text articles published in Turkish and English between May 2012 and July 2022.
3. A clinical trial design was used, including cross-sectional, analytical cross-sectional, and comparative cross-sectional studies.

PECOS criteria were used to screen the eligible studies for this systematic review and meta-analysis (Table 1). Exclusion criteria;

1. Delivery type, postpartum comfort levels, and breastfeeding self-efficacy levels.
2. The full text was not available.
3. The authors could not be reached and reported unextractable or irrelevant raw data.
4. Published in English or other than Turkish.
5. Reviews, editorials, books, news, etc. were.

The number of studies searched for systematic review, the number of studies found eligible and included in the review, and the number of studies excluded and the reasons for exclusion are shown in Fig. 1, in PRISMA flow diagram format.

Data extraction

All articles were imported to a citation manager (Mendeley), and duplicates were removed. Two trained investigators (the first and second authors of this paper) searched the databases and independently screened the titles and abstracts. After searching, filtering by title and abstract, and removing duplicates, the authors gathered and decided on eligible studies suitable for analysis on a full-text basis. Later on, some of the studies had to be excluded from the study during the analysis, as the data they contained was unsuitable. The number of studies searched for systematic review, the number of studies found eligible and included in the review, and the number of studies excluded and the reasons for exclusion are shown in Fig. 1, in PRISMA flow diagram format.

The researchers designed a data extraction tool (Table 2) to acquire study data (Table 2). The data extraction tool made it possible to collect data about the studies included in systematic review and meta-analysis (i.e., author details, place and year of publication, data collection dates, design, scale used, sample size, mean maternal age, and other main findings reported) (see Table 2).

Assessment of methodological quality

The Joanna Briggs Institute Appraisal tools for cross-sectional studies were used for the studies' quality appraisal. The checklist consisted of eight items [30]. Each item was rated as Yes, No, Unclear or Not Applicable. Appraisal results are given in Table 2, with the total number of items (number of Yes responses) accepted as the studies' "Quality Score". Quality appraisal scores for cross-sectional studies were found to be 6/8 yes in 21 studies (Table 2). The vast majority of the studies reviewed met the quality appraisal criteria, which represents a low risk of bias.

Data analysis

The data in this systematic review were synthesized by meta-analysis. Study data in the postpartum comfort section ($n = 10$) were synthesized by meta-analysis. In contrast, the data on breastfeeding self-efficacy ($n = 11$) were explained in tabulated form as the studies examined as part

Table 1 Pecos criteria for inclusion of studies and data extraction

Parameters (PECOS)	Inclusion Criteria
Population (P)	Postpartum women in Türkiye
Exposure (E)	Mode of delivery (women who had a vaginal delivery)
Comparison (C)	Women who did not have a vaginal delivery (cesarean delivery etc.)
Outcomes (O)	Postpartum Comfort Levels and Breastfeeding Self-Efficacy Levels
Study design (S)	Cross-sectional, cross-sectional-analytical, cross-sectional-comparative studies reporting on postpartum comfort and breastfeeding self-efficacy levels were included in systematic review. Studies conducted in the period from 2012 to 2023, published in Turkish and English, were included in the study

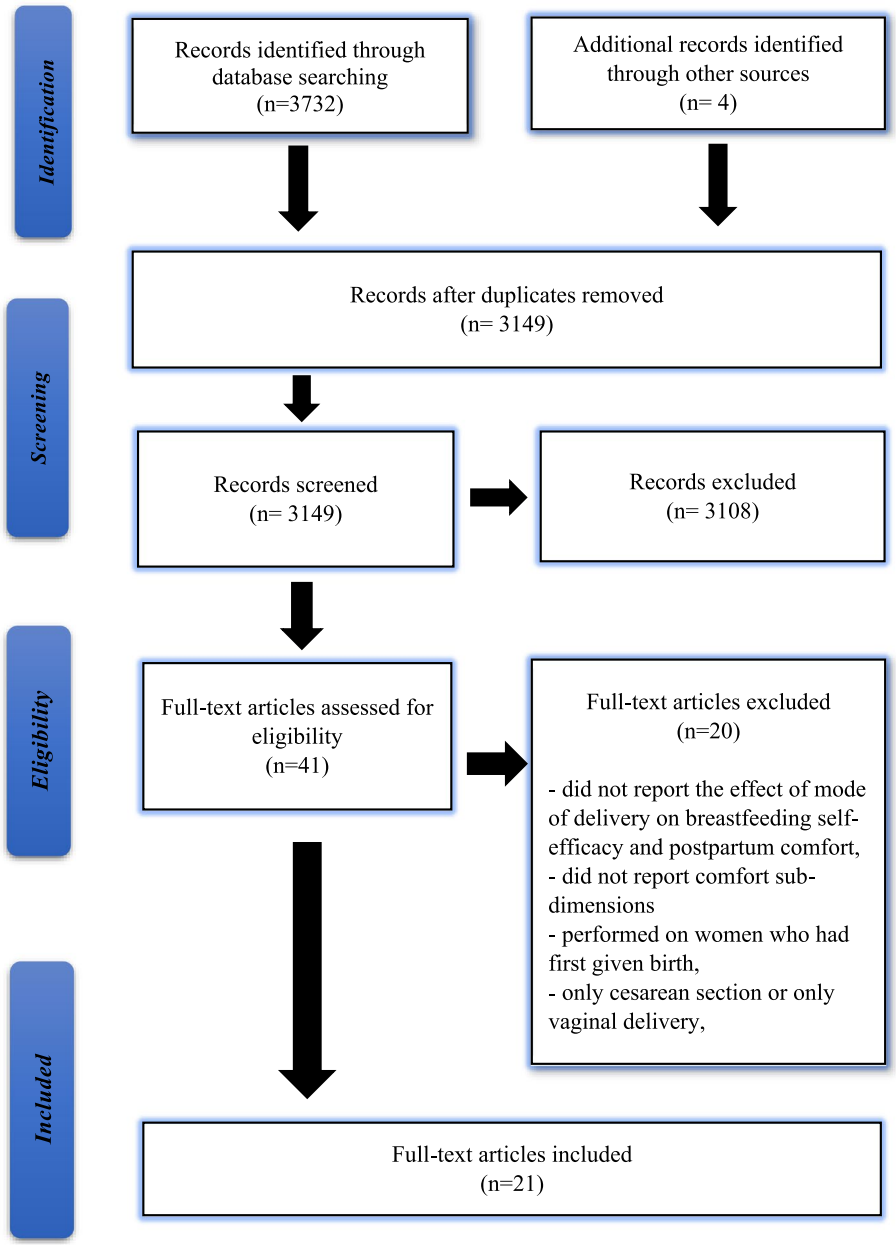

Fig. 1 PRISMA flow diagram

of this study found that the mode of delivery did not affect maternal breastfeeding self-efficacy scores (Table 2). Data obtained from cross-sectional, cross-sectional-analytical, and cross-sectional-comparative studies were synthesized by meta-analysis. There is no missing data in the study. Review Manager Version 5.4 was used for meta-analysis, and the CMA program was used for regression testing. The extent of heterogeneity in the studies was measured by Cochran's Q and Higgins' I^2 tests, and it was accepted that I^2 above 50% was an important indicator of heterogeneity. Accordingly, "Random Effect" results were considered when I^2 was greater than 50%, and "Fixed Effect" results if it was below. Study data consisted of continuous variables calculated by "Mean Difference." All tests were calculated as two-tailed, and $p<0.05$ was considered statistically significant.

Table 2 Characteristics and key findings of studies included in systematic reviews and meta-analyses

Authors	Study type	Data collection tool	City	Year of research	Study area	Sample size	Mean maternal age (SD)	Screening time	Outcome assessment	Quality Score
Büyükkal [3]	Cross-sectional	Postpartum Comfort Questionnaire (PPCQ)	Istanbul	November 2018—January 2019	Hospital	371 pregnant women, of whom 198 had normal spontaneous delivery (NSD) and 173 cesarean delivery (C/S)	C/S 27.39 ± 4.91, NSD 24.47 ± 5.52	Postpartum	- PPCQ mean score of women who had a cesarean delivery (C/S) was 88.71 ± 15.59 and of those who had a vaginal delivery (VD) was 78.24 ± 11.53 - Vaginal delivery (VD) physical comfort sub-scale mean score 33.24 ± 6.45, Psycho-spiritual comfort sub-scale mean score 15. 89 ± 4.13, sociocultural comfort sub-scale mean score 29.04 ± 4.27 - C/S physical comfort sub-scale mean score 37.50 ± 7.13, Psycho-spiritual comfort sub-scale mean score 20.55 ± 6.32, Sociocultural comfort sub-scale mean score 30.53 ± 5.63	Yes: 6 No: 2

Table 2 (continued)

Authors	Study type	Data collection tool	City	Year of research	Study area	Sample size	Mean maternal age (SD)	Screening time	Outcome assessment	Quality Score
Taytan [4]	Cross-sectional	Postpartum Comfort Questionnaire (PPCQ)	Aydın	2018	Hospital	1000 mothers (500 C/S-500 VD)	27.40 ± 5.6	12 to 36 h after delivery	- Scale total score of women who had a cesarean delivery (C/S) 117.902 ± 9.622, scale mean score 3.468 ± 0.283, physical comfort subscale mean score 41.196 ± 4.258; Psycho-spiritual comfort subscale mean score 44.730 ± 4.636, Socio-cultural comfort sub-scale mean score 31.976 ± 5.616 - PPCQ total score of women who had a vaginal delivery (VS) 127.794 ± 12.739, scale mean score 3.757 ± 0.375 physical comfort subscale mean score 47.648 ± 5.606, Psycho-spiritual comfort sub-scale mean score 47, 00 (28–50), Socio-cultural comfort sub-scale mean score 33.914 ± 5.570	Yes: 6 No: 2

Table 2 (continued)

Authors	Study type	Data collection tool	City	Year of research	Study area	Sample size	Mean maternal age (SD)	Screening time	Outcome assessment	Quality Score
Birgili [16]	Cross-sectional	Postpartum Comfort Questionnaire (PPCQ)	Muğla	2017–2018	Hospital	406 mothers (258 C/S-148 VD)	26.04 ± 4.2	Day of discharge from hospital after delivery	- PPCQ mean score of women who had C/S 111.08 ± 8.8 and of those who had VD 109.29 ± 9.57 -VD physical comfort sub-scale mean score 32.02 ± 9.61, Psycho-spiritual comfort sub-scale mean score 16.90 ± 5.13, socio-cultural comfort sub-scale mean score 27.60 ± 4.89 -C/S physical comfort sub-scale mean score 42.50 ± 9.43, Psycho-spiritual comfort sub-scale mean score 19.25 ± 5.24, socio-cultural comfort sub-scale mean score 28.44 ± 4.42	Yes: 6 No: 2

Table 2 (continued)

Authors	Study type	Data collection tool	City	Year of research	Study area	Sample size	Mean maternal age (SD)	Screening time	Outcome assessment	Quality Score
Capık et al., [7]	Cross-sectional	Postpartum Comfort Questionnaire (PPCQ)	Erzurum	2010–2011	Hospital	233 mothers (116 VD, 117 C/S)		Postpartum	-PPCQ mean score of women who had C/S 117.05 ± 13.24 and of those who had VD 119.53 ± 13.93 - Vaginal delivery physical comfort sub-scale mean score 46.69 ± 7.34, psycho-spiritual comfort sub-scale mean score 37.74 ± 4.52, socio-cultural comfort sub-scale mean score 32.58 ± 5.10, - Abdominal delivery physical comfort sub-scale mean score 44.55 ± 7.84, psycho-spiritual comfort sub-scale mean score 38.65 ± 4.78, socio-cultural comfort sub-scale mean score 31.15 ± 5.03	Yes: 6 No: 2

Table 2 (continued)

Authors	Study type	Data collection tool	City	Year of research	Study area	Sample size	Mean maternal age (SD)	Screening time	Outcome assessment	Quality Score
Sis Celik and Celik, [17]	Cross-sectional	Postpartum Comfort Questionnaire (PPCQ)	Erzurum	January-December 2015	Hospital	267 postpartum women, of whom 131 had a cesarean delivery with general anesthesia and 136 had a vaginal birth without anesthesia	29.05 ± 6.23	Day of discharge from hospital	-PPCQ mean score of women who had C/S 116.28 ± 9.18 and of those who had VD 117.64 ± 9.52 -Vaginal delivery physical comfort sub-scale mean score 46.2 ± 4.9,psycho-spiritual comfort sub-scale mean score 39.8 ± 2.2, socio-cultural comfort sub-scale mean score 33.2 ± 2.3, - Vaginal delivery physical comfort sub-scale mean score 41.02 ± 7.42, psycho-spiritual comfort sub-scale mean score 39.6 ± 5.1, socio-cultural comfort sub-scale mean score 30.8 ± 3.6	Yes: 6 No: 2

Table 2 (continued)

Authors	Study type	Data collection tool	City	Year of research	Study area	Sample size	Mean maternal age (SD)	Screening time	Outcome assessment	Quality Score
Aksoy Derya et al., [6]	Cross-sectional	Postpartum Comfort Questionnaire (PPCQ)	Malatya	01 April-31 May 2019	Hospital	324 postpartum women (202 VD, 122 C/S)	28.79 ± 5.59	At C/S recovery ward after delivery	-PPCQ mean score of women who had C/S 115.79 ± 14.34 and of those who had VD 121.98 ± 16.07 - vaginal delivery p comfort sub-scale mean score 47.47 ± 7.99, psycho-spiritual comfort sub-scale mean score 41.87 ± 6.55, Socio-cultural comfort sub-scale mean score 32.63 ± 6.60, - cesarean delivery physical comfort sub-scale mean score 43.49 ± 7.01, psycho-spiritual comfort sub-scale mean score 41.49 ± 7.14, Socio-cultural comfort sub-scale mean score 30.80 ± 6.14	Yes: 6 No: 2

Table 2 (continued)

Authors	Study type	Data collection tool	City	Year of research	Study area	Sample size	Mean maternal age (SD)	Screening time	Outcome assessment	Quality Score
Kurt Can and Apay, [18]	Comparative-Cross-sectional	Postpartum Comfort Questionnaire (PPCQ)	Erzurum	July-December 2016	Hospital	417 postpartum women, of whom 208 had a vaginal delivery and 209 had a cesarean delivery		Within 24–48 h postpartum	-PPCQ mean score of women who had C/S 114.58 ± 11.9 and of those who had VD 121.72 ± 11.9 -VD physical comfort sub-scale mean score 45.26 ± 7, psycho-spiritual comfort sub-scale mean score 42.8 ± 4.8, Socio-cultural comfort sub-scale mean score 32.33 ± 5.8 - cesarean delivery physical comfort sub-scale mean score 40.88 ± 6.58, psycho-spiritual comfort sub-scale mean score 42.2 ± 5.9, Socio-cultural comfort sub-scale mean score 29.5 ± 5.2	Yes: 6 No: 2

Table 2 (continued)

Authors	Study type	Data collection tool	City	Year of research	Study area	Sample size	Mean maternal age (SD)	Screening time	Outcome assessment	Quality Score
Erkaya et al., [19]	Cross-sectional	Postpartum Comfort Questionnaire (PPCQ)	Trabzon	1 November- 30 December 2015	Hospital	233 mothers (126 VD, 107 C/S)	29.24 ± 5.20	Postpartum	-PPCQ mean score of women who had C/S 82.022 ± 16.997and of those who had VD 82.339 ± 15.714 -VD physical comfort sub-scale mean score 33.107 ± 7.919, psycho-spiritual comfort sub-scale mean score 31.188 ± 7.121, Sociocultural comfort sub-scale mean score 18.045 ± 4.235 - cesarean delivery physical comfort sub-scale mean score 32.656 ± 8.273, psycho-spiritual comfort sub-scale mean score 30.699 ± 7.584, Socio-cultural comfort sub-scale mean score 18.667 ± 4.742	Yes: 6 No: 2

Table 2 (continued)

Authors	Study type	Data collection tool	City	Year of research	Study area	Sample size	Mean maternal age (SD)	Screening time	Outcome assessment	Quality Score
Özöztürk et al., [20]	Cross-sectional	Postpartum Comfort Questionnaire (PPCQ)	Izmir	November 2017-July 2019	Hospital	200 mothers (78 VD, 122 C/S)	29.67 ± 5.63	Postpartum 12 h after delivery	-PPCQ mean score of women who had C/S 116.28 ± 12.58 and of those who had VD 114.24 ± 11.9 -VD physical comfort sub-scale mean score 41.44 ± 6.16, psycho-spiritual comfort sub-scale mean score 42.1 ± 4.9, Socio-cultural comfort sub-scale mean score 30.6 ± 4.8 - cesarean delivery physical comfort sub-scale mean score 42.14 ± 7.14, psycho-spiritual comfort sub-scale mean score 42.9 ± 3.9, Socio-cultural comfort sub-scale mean score 31.1 ± 5.5	Yes: 6 No: 2

Table 2 (continued)

Authors	Study type	Data collection tool	City	Year of research	Study area	Sample size	Mean maternal age (SD)	Screening time	Outcome assessment	Quality Score
Balsak [8]	Comparative-Cross-sectional	Postpartum Comfort Questionnaire (PPCQ)	Diyarbakir	February 2017-April 2017	Hospital	396 mothers (213 VD, 183 C/S)		Postpartum (0–6 weeks)	-PPCQ mean score of women who had C/S 81.2 ± 22.6 and of those who had VD 84.2 ± 25 dir -VD physical comfort sub-scale mean score 37.3 ± 10.7, psycho-spiritual comfort sub-scale mean score 20.9 ± 8.5, Socio-cultural comfort sub-scale mean score 25.9 ± 8.6 - cesarean delivery physical comfort sub-scale mean score 35.6 ± 9.9, psycho-spiritual comfort sub-scale mean score 20.4 ± 7.6, Socio-cultural comfort sub-scale mean score 25.1 ± 8.1	Yes: 6 No: 2
Cantürk and Kostak, [11]	Analytical-Cross-sectional	Breastfeeding Self-Efficacy Questionnaire (BSEQ)	Istanbul	February 2017-June 2017	Hospital	442 (221 VD, 221 C/S with anesthesia)		Postpartum	-Mothers' BSEQ mean score 61.72 ± 9.77 - VD breastfeeding self-efficacy mean score 61.57 ± 9.81, mean score of women who had C/S with general anesthesia 61. 63 ± 8.92	Yes: 6 No: 2

Table 2 (continued)

Authors	Study type	Data collection tool	City	Year of research	Study area	Sample size	Mean maternal age (SD)	Screening time	Outcome assessment	Quality Score
Akkoyun and Tas Arslan [21]	Cross-sectional	Breastfeeding Self-Efficacy Questionnaire	Konya	24 March—8 April 2016	Hospital	107 mothers (51 VD, 56 C/S)		Women with a 0-6 months old baby	- vaginal delivery breastfeeding self-efficacy mean score 59. 27 ± 9.22, cesarean delivery breastfeeding self-efficacy mean score 59.10 ± 9.76	Yes: 6 No: 2
Yol and Tezel, [22]	Cross-sectional	Breastfeeding Self-Efficacy Questionnaire	Ankara	May 2015-May 2016	Hospital	115 mothers (67 VD, 48 C/S)		At NICU, postpartum and postoperative recovery wards, mothers of babies receiving phototherapy due to UHB	- vaginal delivery breastfeeding self-efficacy mean score 51.54 ± 9.128, cesarean delivery breastfeeding self-efficacy mean score 52.15 ± 9.910	Yes: 6 No: 2
İnce et al., [23]	Cross-sectional	Breastfeeding Self-Efficacy Questionnaire	Izmir	January and July 2017	Hospital	91 mothers (51 VD, 56 C/S)	29.4	Women with a 0-6 months old baby	- vaginal delivery breastfeeding self-efficacy mean score 59.27 ± 9.22, cesarean delivery breastfeeding self-efficacy mean score 59.10 ± 9.76	Yes: 6 No: 2
Aslan and Ege, [12]	Cross-sectional	Breastfeeding Self-Efficacy Questionnaire	Konya	2016	Family Health Center	265 mothers (125 VD, 140 C/S)	28.40 ± 5.71	Women with a 4-6 weeks old baby	- vaginal delivery breastfeeding self-efficacy mean score 59.40 ± 7.457, cesarean delivery breastfeeding self-efficacy mean score 58.49 ± 7.753	Yes: 6 No: 2
Aksoy et al., [24]	Cross-sectional	Breastfeeding Self-Efficacy Questionnaire	Konya	1 January 2016- 31 April 2016	Hospital	324 postpartum women (219 VD, 105 C/S)	27.49 ± 6.47	Postpartum	- vaginal delivery breastfeeding self-efficacy mean score 52.87 ± 10.25, cesarean delivery breastfeeding self-efficacy mean score 54.82 ± 9.82	Yes: 6 No: 2

Table 2 (continued)

Authors	Study type	Data collection tool	City	Year of research	Study area	Sample size	Mean maternal age (SD)	Screening time	Outcome assessment	Quality Score
Bölükbaşı [25]	Cross-sectional	Breastfeeding Self-Efficacy Questionnaire – Short form	Konya	June—November 2015	Hospital	228 breastfeeding women (119 VD, 109 C/S)	27.96 ± 5.25	2 weeks to 6 months postpartum	- vaginal delivery breastfeeding self-efficacy mean score 60.6 ± 6. 46, cesarean delivery breastfeeding self-efficacy mean score 59.7 ± 5.96	Yes: 6 No: 2
Turan and Bozkurt, [26]	Cross-sectional	Breastfeeding Self-Efficacy Questionnaire	Istanbul	December 2016-August 2017	Hospital	320 mothers (173 VD, 147 C/S)	23.99 ± 3.85	Face-to-face within the first 24 h postpartum and by phone call at day 15	VD breastfeeding self-efficacy mean score by 24 h 58.99 ± 7.48, by day 15: 65.90 ± 6.77; cesarean delivery breastfeeding self-efficacy mean score by 24 h 54.69 ± 8.01, by day 15: 60.47 ± 8.07	Yes: 6 No: 2
Kirca and Adibelli, [27]	Cross-sectional	Breastfeeding Self-Efficacy Questionnaire	Antalya	March 2018-May 2018	Hospital	254 mothers (183 VD, 71 C/S)		Postpartum	VD breastfeeding self-efficacy mean score 47.93 ± 13.30, cesarean delivery breastfeeding self-efficacy mean score 49.21 ± 12.39	Yes: 6 No: 2
Ergezen et al., [28]	Comparative-Cross-sectional	Breastfeeding Self-Efficacy Questionnaire (BSEQ)- Short version	Antalya	May 2018- October 2018	Hospital	102 mothers (32 VD, 70 C/S)		24–48 h postpartum	Mothers' BSEQ mean score 57.30 (10.46). vaginal delivery breastfeeding self-efficacy mean score 58.43 ± 7.29, cesarean delivery breastfeeding self-efficacy mean score 56.78 ± 11.64	Yes: 6 No: 2

Table 2 (continued)

Authors	Study type	Data collection tool	City	Year of research	Study area	Sample size	Mean maternal age (SD)	Screening time	Outcome assessment	Quality Score
Işık et al., [29]	Analytical-Cross-sectional	Breastfeeding Self-Efficacy Questionnaire-Short version	Izmir	January–September 2016	Hospital	153 mothers (90 C/S, 63 VD)	Mean age for VD 28.09 ± 4.82, mean age for C/S 28.84 ± 5.29	24 h postpartum and by phone call in week four	vaginal delivery breastfeeding self-efficacy mean score by 24 h 55.76 ± 8.05, by week four 59.51 ± 8.10; cesarean delivery breastfeeding self-efficacy mean score by 24 h 52.02 ± 7.46, by week four 57.27 ± 7.08	Yes: 6 No: 2

VD Vaginal delivery, *C/S* Cesarean delivery, *PPCQ* Postpartum Comfort Questionnaire, *BSEQ* Breastfeeding Self-Efficacy Questionnaire

Results

Study selection

After subject selection, a total of 3736 records were identified, therefrom 3732 records were found through database searching and four additional records through other sources. After removal of duplicates, the records were screened by title and abstract, and as a result, the full texts of 41 articles were accessed. These 41 full-text articles were assessed for eligibility, and as a result, 21 articles were included in the study in Fig. 1.

Study and participant characteristics

Of the studies included in systematic review, 16 were cross-sectional, two was analytical-cross- sectional, and three were comparative cross-sectional studies [3, 4, 6–8, 11, 12, 16, 29]. The studies had been conducted in 12 different cities of Turkey: Konya (3), Ankara (1), Izmir (3), Erzurum (3), Antalya (1), Istanbul (3), Çankırı (1), Diyarbakir (1), Trabzon (1), Malatya (1), Muğla (1) and Aydın (1). Total sample size of the studies was 5266 (postpartum comfort sample group: 3847; breastfeeding self- efficacy sample group: 1429) (Table 1). Of the studies ($n=21$), 3 had been published in English and 19 in Turkish. Systematic review of the studies showed that, in general terms, the mean age of postpartum women was between 23 and 28 years, while nine studies specified no mean age. It was determined that the studies included in the review and analysis were published between 2014–2022. The data collection tools, sample size and quality score of the studies and the age and group characteristics of participants are presented in Table 2.

Postpartum comfort

In this systematic review and meta-analysis, ten studies [3, 4, 6–8, 16–20] were found to report results on the effect of mode of delivery on maternal postpartum comfort, as assessed by means of a Postpartum Comfort Questionnaire. Combined results of these studies showed that delivery by cesarean delivery reduced postpartum comfort, while in meta-analysis the outcome was found to be statistically insignificant (MD:-1.63, 95%: -5.76-2.50, Z=0.77, $p=0.44$, Fig. 2). Estimated heterogeneity as measured by I^2 was 96% ($p<0.00001$), and asymmetric outliers were seen in funnel plot (Figs. 2 and 3). Egger's regression test showed that the effect of publication bias was small (t: 1, 92, $p=0,090$).

Postpartum comfort sub-dimensions

Physical comfort sub-dimension

Of the studies examined in this systematic review and meta- analysis, ten studies [3, 4, 6–8, 16–20] reported results on the effect of mode of delivery on the physical sub- dimension of maternal postpartum comfort. Combined results of these studies showed that cesarean delivery reduced physical postpartum comfort, while in meta-analysis the outcome was found to be statistically insignificant (MD: -0,97, 95%: -4,11- 2.17, Z=0.61, $p=0.54$, Fig. 4).

Psycho-spiritual comfort sub-dimension

Of the studies examined in this systematic review and meta-analysis, ten studies [3, 4, 6–8, 16–20] reported results on the effect of mode of delivery on the psycho-spiritual sub-dimension of maternal postpartum comfort. Combined results of these studies showed that vaginal delivery increased psycho-spiritual postpartum comfort, while in meta-analysis the outcome was found to be statistically insignificant (MD: 0.47 95%: -1.13–2.08, Z=0.58, $p=0.57$, Fig. 4).

Socio-cultural comfort sub-dimension

Of the studies examined in this systematic review and meta-analysis, ten studies [3, 4, 6–8, 16–20] reported results on the effect of mode of delivery on the socio-cultural sub-dimension of maternal postpartum comfort. Combined results of these studies showed that cesarean delivery reduced sociocultural postpartum comfort, while in meta-analysis the outcome was found to be statistically insignificant (MD: -0.87 95%: -1.98–0.24, Z=1.53, $p=0.13$, Fig. 4).

Breastfeeding self-efficacy

In the 11 studies [11, 12, 21–29] examined in this systematic review in terms of breastfeeding self- efficacy, one study found a significant difference between delivery mode and breastfeeding self- efficacy, but no significant difference was found in the remaining ten. When we look at the results of the said one study conducted by Işık et al. [29], in which they found that the mode of delivery affected breastfeeding self-efficacy, it can be seen that vaginal delivery was found to affect breastfeeding self-efficacy 24 h postpartum, but not by week 4. Since most of the studies included in this systematic review did not have any effect on breastfeeding self-efficacy and there were no homogeneous data, no meta-analysis was conducted on this subject.

Discussion

This systematic review and meta-analysis present the combined results of 21 cross-sectional studies reporting on postpartum comfort and breastfeeding self-efficacy outcomes by mode of delivery [3, 4, 6–8, 11, 12, 16, 29]. The results of these studies are important as they can contribute to improving the follow-up and care services offered to postpartum women.

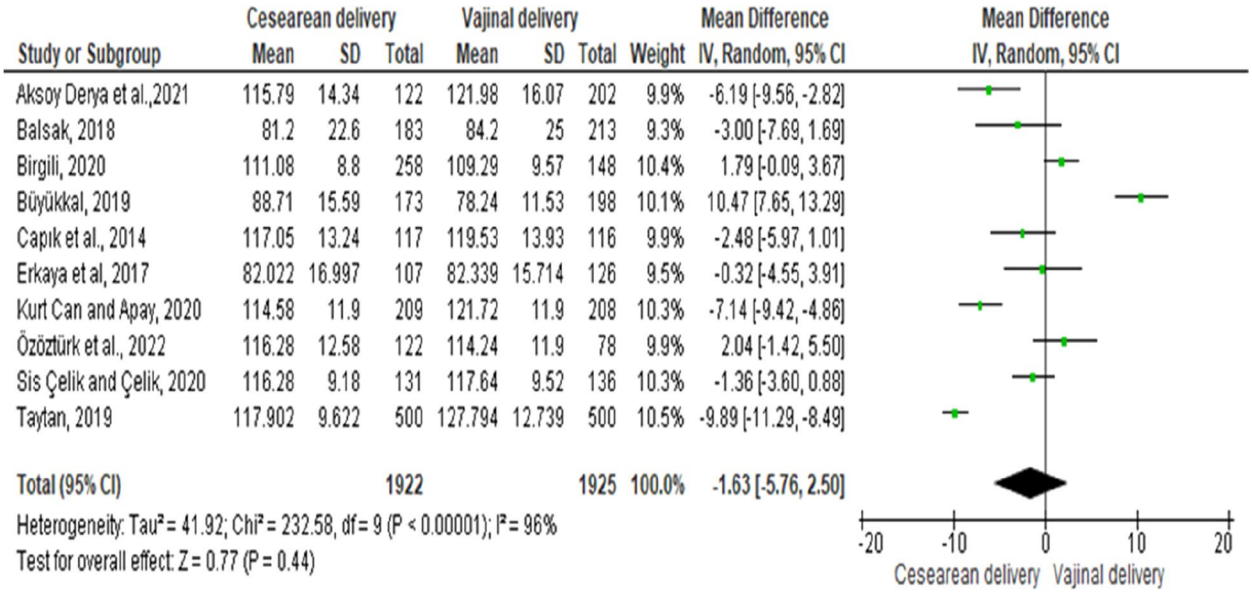

Fig. 2 Forest plot of the effect of mode of delivery on postpartum comfort level

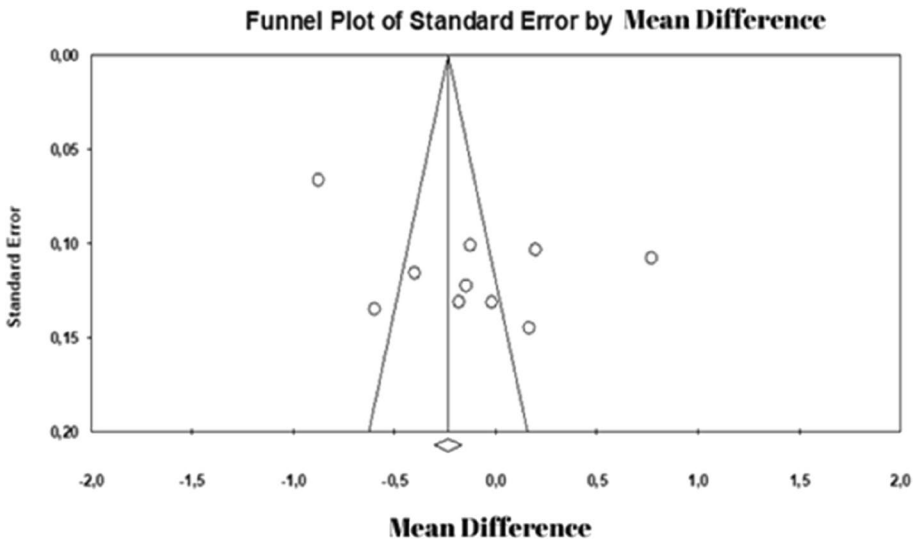

Fig. 3 Funnel plot of the effect of mode of delivery on postpartum comfort level

The combined results of the studies examined in the meta-analysis showed that cesarean delivery reduced postpartum comfort, and the outcome was found statistically insignificant. A survey by Şahin and Sinan [31] reported moderate maternal postpartum comfort, whereas postpartum comfort level after a cesarean section was low. The study shows parallelism with the meta-analysis findings. In this sense, factors affecting maternal postpartum comfort in the event of a cesarean section may include incision pain, nausea, vomiting, pain, breastfeeding problems, and excretory issues, suggesting that maternal comfort level is lower after a cesarean delivery. Midwives should observe the problems mothers face, regardless of their mode of delivery, and should provide adequate care to solve those problems and improve their comfort level.

The combined results of the studies examined in the meta-analysis showed that cesarean delivery reduced physical postpartum comfort, and the outcome was found statistically insignificant. Pınar et al. [32] also found that maternal physical comfort was higher in women who had given birth vaginally. Another study

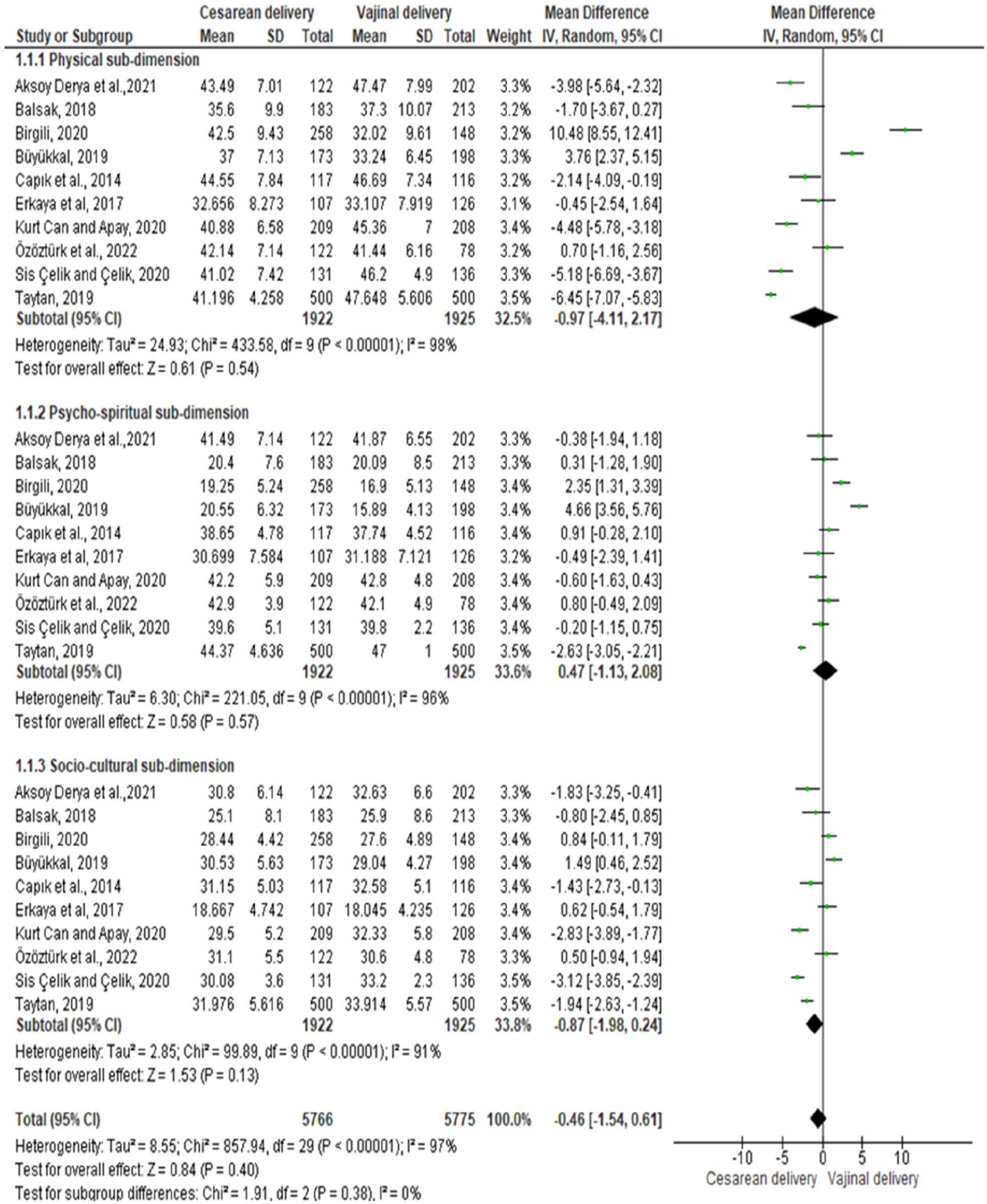

Fig. 4 Forest plot of the effect of mode of delivery on postpartum comfort sub-dimensions level

also determined that physical comfort was more elevated in mothers who had given birth vaginally [33]. Physical comfort is associated with bodily perceptions, including physiological factors like nutrition, excretion, rest, and hemodynamics that affect the individual's physical condition [34]. The worse a person's physical condition gets, the lower their level of physical comfort. Since mothers who gave birth by cesarean section were exposed to anesthesia at much higher rates, the side effects of anesthesia and the pain level they experienced suggest that physical comfort is lower in cesarean deliveries compared to mothers who gave vaginal birth.

The combined results of the studies examined in the meta-analysis showed that vaginal delivery increased psycho-spiritual postpartum comfort, and the outcome was found statistically insignificant. Karakaplan [33] stated in his research that the psycho-spiritual level in women with a vaginal delivery was higher than in those with a cesarean section. Psycho-spiritual comfort covers emotional concepts such as self-esteem, self-concept, and self-awareness, all of which give meaning to an individual's life. The factors affecting psycho-spiritual postpartum comfort include maternal role adaptation, emotional changes in the maternal role, mother-infant interaction, maternal stress, and anxiety [7, 17]. Based on the results, it can be said that psycho-spiritual comfort levels are higher in mothers giving birth vaginally, which can be attributed to reasons like the higher level of pain, stress, and anxiety experienced by mothers having a cesarean delivery, along with prolonged maternal role adaptation and delayed mother-infant interaction.

The combined results of the studies examined in the meta-analysis showed that cesarean delivery reduced sociocultural postpartum comfort, and the outcome was found statistically insignificant. Factors that constitute sociocultural comfort include family traditions/customs, religious beliefs, benefiting from financial support, and interpersonal communication [5, 34]. In this context, information and counseling should be given to the individuals to create sociocultural care, and it should be ensured that they receive care, social support, discharge, and education, taking into account their family traditions and habits [5, 35]. Being hospitalized for delivery in an environment away from home, facing the complex structure of the hospital, being dependent on others in many activities during and after delivery, limitation of movement, and having to adapt to unfamiliar procedures in the hospital environment are all factors that disrupt sociocultural comfort [17]. Hence, the mode of delivery is one of the most important factors affecting comfort [7]. According to the results of the meta-analysis, it can be said that the sociocultural comfort of the mother after vaginal delivery is higher than after cesarean section because women who have vaginal delivery have freedom of movement, can take care of themselves, and have a shorter hospital stay.

The studies included in this systematic review, reporting findings on breastfeeding self-efficacy, found that mode of delivery did not affect breastfeeding self-efficacy. Gürol [36], Aydın, and Aba [37] said there was no significant difference in breastfeeding self-efficacy among vaginal or cesarean delivery women. In a systematic review, Işık et al. [29] reported that mothers who had given vaginal birth had a high and significant breastfeeding self-efficacy within 24 h.

According to Dennis, the mother's perception of breastfeeding self-efficacy; shows whether the mother will breastfeed, how much effort she will put into it, her thoughts about breastfeeding, and her ability to cope emotionally with the difficulties she will face during the breastfeeding process. The self-efficacy perceived by the mother regarding breastfeeding may be related to the problems experienced in different situations before [38, 39]. Mothers with high self-efficacy encourage themselves in the face of difficulties and try to solve the events by thinking positively [40]. These mothers prefer to breastfeed more, are more courageous, and act positively when faced with difficulties. In parallel with this study, in a study conducted by Dennis, it was determined that mothers who gave birth by cesarean section had lower breastfeeding self-efficacy scores due to delayed mother-infant interaction. Regardless of the mode of delivery, starting breastfeeding within the first half hour after birth is very important for mother-infant interaction [41]. It is also concluded that mother-infant interaction is delayed due to postpartum pain, stress, anxiety, and problems adapting to a new life and that, therefore, mothers may tend to prioritize their self-care. Since midwives are direct observers of the breastfeeding behaviors of mothers, they have an active role in solving existing problems and providing breastfeeding counseling. Counseling by midwives is important for solving breastfeeding problems faced by mothers and raising their self-efficacy perceptions.

Strengths and limitations of the study

The strengths of the present study were the scores recorded in the quality appraisal of the studies reviewed in this systematic review and meta-analysis and the wide variety of additional sources available for screening. The large sample size available to review data within the scope of this study was another vital aspect that strengthened the outcomes. Analyzing and comparing the results with other studies supported the analysis even further. The weakness of this review was that the studies included in the systematic review and meta-analysis were conducted

only in Türkiye and hence, cannot be generalized to the general population. Since the low homogeneity of the studies reviewed may weaken the strength of evidence, the Random Effect model was used to control this factor in studies with high heterogeneity.

Conclusion and suggestions

In this systematic review and meta-analysis, we combined the results of 21 studies to present comprehensive data on maternal postpartum comfort and breastfeeding self-efficacy by mode of delivery. Because of the review, it was seen that the mode of delivery did not affect breastfeeding self-efficacy. In addition, it was observed that the mode of delivery affected postpartum comfort and its sub-dimensions, albeit not significantly. It was seen that, regarding the impact of the mode of delivery on postpartum comfort, cesarean delivery reduced physical comfort and sociocultural comfort, while vaginal delivery increased psycho-spiritual comfort. Against the background of these results, it is recommended that:

- healthcare professionals take into account the factors that may affect postpartum comfort in the light of evidence-based practices and plan maternal care to increase their comfort,
- maternal postpartum comfort be improved by avoiding unnecessary procedures during normal labor, and
- healthcare professionals ground maternal postpartum care on the theory of comfort,
- healthcare professionals identify breastfeeding problems by observing the mother before, during, and after birth, giving counseling when necessary, and leveraging their perception of breastfeeding self-efficacy.

Authors' contributions
HO Conceptualization; Investigation; Writing - original draft; Funding acquisition; Methodology; Validation; Writing - review & editing; Visualization; Software; Formal analysis; Project administration; Data curation; Supervision; Resources. EOA Supervision; Resources; Writing - review & editing; Writing - original draft; Data curation. HKI Writing - original draft; Writing - review & editing.

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Competing interests
The authors declare no competing interests.

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References

1. Karabulutlu Ö. Factors affecting women's birth type preferences. Florence Nightingale Nurs J. 2012;20(3):210.
2. Taşkın, L. Doğum ve kadın sağlığı hemşireliği. 17. (Taşkın L. ed.). Ankara: Baskı, Akademisyen Kitabevi; 2021. p. 121–32.
3. Büyükkal T. The effect of delivery type on optimality level and comfort. Istanbul: Istanbul University-Cerrahpaşa, Graduate School of Education, Midwifery Department. Master's Thesis; 2019.
4. Taytan S. The effect of caesarean section on the postpartum comfort level of mothers. Aydın: Aydın Adnan Menderes University Institute of Health Sciences Department of Midwifery. Master's Thesis; 2019.
5. Kolcaba K. Comfort theory and practice: a vision for holistic health care and research. New York: Springer Publishing Co.; 2003.
6. Aksoy Derya Y, İbici Akça E, Kamalak H, Gökbulut N. The effect of the number of births, the mode of delivery and the planned pregnancy status on posttraumatic development and comfort in puerperant women. Mersin Univ Health Sci J. 2021;14(3):366–77. https://doi.org/10.26559/mersinsbd.828603.
7. Çapık A, Özkan H, Apay ES. Determination of postpartum comfort levels and influencing factors in postpartum women. Dokuz Eylul Univ Fac Nurs Electr J. 2014;7(3):186–92.
8. Narin Balsak H. The relationship between postpartum comfort and breastfeeding self-efficacy in mothers. Turkey: Institute of Health Sciences, Department of Nursing (Doctoral dissertation, Master's Thesis, Gaziantep: Gaziantep University); 2018.
9. UNICEF. Breastfeeding: A smart investment. Available at https://www.globalbreastfeedingcollective.org/. Accessed 02 Aug. 2022.
10. WHO. Health Topics: Breastfeeding. Available at https://www.who.int/health-topics/breastfeeding#tab=tab_2. Accessed 02 Aug. 2022.
11. Cantürk D, Akgün Kostak M. First breastfeeding behaviors, breastfeeding self-efficacy levels and influencing factors of mothers who had vaginal delivery and cesarean section. Mersin Univ J Health Sci. 2020;13(3):382–94. https://doi.org/10.26559/mersinsbd.718662.
12. Aslan Y, Ege E. Association of mothers with breastfeeding self-efficacy and risk of depression. J Hum Sci. 2016;13(2):3160–72.
13. Akyüz A, Kaya T, Şenel N. Determining the breastfeeding behavior of the mother and the conditions affecting breastfeeding. TAF Prev Med Bullet. 2007;6(5):331–5.
14. Şahin G, Ergüven M. Evaluation of knowledge, practice and behaviors of breastfeeding mothers. İstanbul: Master thesis. Advisor: Müferet Ergüven, Istanbul Göztepe Training and Research Hospital Family Medicine Coordinator; 2008.
15. Moher D, Liberati A, Tetzlaff J, Altman DG. Preferred reporting items for systematic reviews and meta-analyses: PRISMA statement. BMJ. 2009;339:b2535.https://doi.org/10.1136/bmj.b2535
16. Birgili F. Postpartum comfort of women giving birth and affecting factors. Anatolian J Nurs Health Sci. 2020;23(3):351–60. https://doi.org/10.17049/ataunihem.484941.
17. Sis Çelik A, Çelik EC. Do the type of birth and the type of anesthesia taken at birth affect postpartum comfort? Jaren. 2020;6(1):97–108. https://doi.org/10.5222/jaren.2020.46704.
18. Kurt Can E, Ejder Apay S. Mode of delivery: does it affect postpartum comfort and birth satisfaction levels? J İnönü Univ Voc School Health Serv. 2020;8(3):547–65. https://doi.org/10.33715/inonusaglik.753497.
19. Erkaya R, Türk R, Sakar T. Determining comfort levels of postpartum women after vaginal and caesarean birth. Procedia Soc Behav Sci. 2017;237:1526–32. https://doi.org/10.1016/j.sbspro.2017.02.240.

20. Özöztürk S, Aluş Tokat M, Aypar Akbağ NN, Ekinci F. The relationship between birth satisfaction and postpartum comfort by delivery type and parity. TJFMPC. 2022;16(1):179–88. https://doi.org/10.21763/tjfmpc.952205.
21. Akkoyun S, Taş AF. Breastfeeding self-efficacy of breastfeeding mothers during the first six months. J Pediatr Res. 2016;3(4):191–5. https://doi.org/10.4274/jpr.50469.
22. Yol E. Evaluation of breastfeeding self-efficacy and breastfeeding success of mothers whose babies were diagnosed with indirect hyperbilirubinemia. Ankara: Nursing Master's Thesis), Ankara University Institute of Health Sciences; 2017.
23. İnce T, Aktaş G, Aktepe N, Aydın A. Evaluation of mothers' breastfeeding self-efficacy and characteristics affecting breastfeeding success. Journal of Dr. Behcet Uz Children's Hospital. 2017;7(3). https://doi.org/10.5222/buchd.2017.183.
24. Erkal Aksoy Y, Ünal F, İnçke G, Çil G, Oruç K, Yılmaz T, et al. The effect of postpartum depression on breastfeeding. Gumushane Univ J Health Sci. 2016;5(3):90–6.
25. Bölükbaşı H. The effect of postpartum depression on breastfeeding self-efficacy, breastfeeding success and nutritional status in the postpartum six-month period. Ankara: Gazi University Institute of Health Sciences, Department of Nutrition and Dietetics, Master's Thesis; 2016.
26. Turan A, Bozkurt G. Breastfeeding self-efficacy levels of primiparous mothers according to the mode of delivery and breastfeeding characteristics. EUHFD. 2020;36(1):1–10.
27. Kırca N, Adıbelli D. The effect of delivery type on breastfeeding self-efficacy perception. Int J Mainten Sci. 2020;13(1):698.
28. Ergezen Y, Efe E, Çalışkan Özdöl F. The Relationship Between Breastfeeding Self-Efficacy Perceptions of Mothers and Breastfeeding Success in the Postpartum Period. Dokuz Eylul Univ Fac Nurs Electr J. 2021;14(3):217–23. https://doi.org/10.46483/deuhfed.675733.
29. Işık G, Cetişli NE, Başkaya VA. Postpartum pain, age and seasonal self-efficacy of mothers by birthday. Dokuz Eylul Univ Fac Nurs Electr J. 2018;11(3):224–32.
30. Moola S, Munn Z, Tufanaru C, Stern C, Porritt K, Farrow J.Chapter 7: Systematic reviews of etiology and risk. In: Aromataris E, Munn Z, ed. JBI Guide to Evidence Synthesis. JBI. 2020. https://doi.org/10.46658/JBIMES-20-08.
31. Sahin S, Sinan Ö. Investigation of mothers' postpartum breastfeeding and comfort conditions. Health Care Women Int. 2021;42(4–6):913–24. https://doi.org/10.1080/07399332.2021.1883022.
32. Pınar G, Doğan N, Algıer L, Kaya N, Çakmak F. Factors affecting the postpartum comfort of mothers. Dicle Med J. 2009;36(3):184–90.
33. Karakaplan S. The effects of delivery type on postpartum comfort of mothers and newborns. İstanbul: Marmara University, Institute of Health Sciences, Department of Obstetrics and Gynecology Nursing. Master's Thesis; 2007.
34. Kolcaba KY. A Theory of holistic comfort for nursing. J Adv Nurs. 1994;19(6):1178–84.
35. Kolcaba KY, Kolcaba RJ. An analysis of the concept of comfort. J Adv Nurs. 1991;16:1301–10.
36. Gürol ES. Determining the relationship between breastfeeding proficiency status of mothers and nipple pain/trauma. İzmir: Master's Thesis, Ege University. Health Sciences Institute,; 2011.
37. Aydın D, Aba YA. The relationship between mothers' health literacy levels and breastfeeding self-efficacy perceptions. DEUHFED. 2019;12(1):31–9.
38. Dennis CL, Faux S. Development and psychometric testing of breastfeeding self - efficacy scale. Res Nurs Health. 1999;22:399–409. https://doi.org/10.1002/(SICI)1098-240X(199910)22:5<399::AID-NUR6>3.0.CO;2-44.
39. Wutke K, Dennis CL. The reliability and validity of the Polish version of the Breastfeeding Self-Efficacy Scale-Short Form: translation and psychometric assessment. Int J Nurs Stud. 2007;44(8):1439–46. https://doi.org/10.1016/j.ijnurstu.2006.08.001.
40. Dennis CL. Theoretical underpinnings of breast-feeding confidence: a self-efficacy framework. J Hum Lact. 1999;15:195–201. https://doi.org/10.1177/089033449901500303.
41. Dennis CL. Breastfeeding self-efficacy scale: Psychometric assessment of the short form. J Obstet Gynecol Neonatal Nurs. 2003;32(6):734–44.

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