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Prevalence of negative birth experience: a systematic review and meta-analysis



Marzieh Bagherinia¹, Arezoo Haseli^{2,7*}, Elham Bagherinia³, Nasrin Mansouri⁴, Mahrokh Dolatian⁵ and Zoherh Mahmoodi⁶

Abstract

Introduction The overall experience women gain from the childbirth process is a significant outcome that is highly complex, subjective, and based on personal judgment. Cultural, social, and environmental contexts and societal policies can also influence it. The present systematic study and meta-analysis aim to conduct a comprehensive review to estimate the prevalence of negative childbirth experiences.

Methods Published observational studies were reviewed without any time restrictions to conduct this systematic review. Relevant material was searched thoroughly in the PubMed/Medline, Embase, Web of Science, Scopus, ProQuest, and Google Scholar databases. Two authors independently evaluated the studies' quality using a modified Joanna Briggs checklists (JBI) version. Cochran's Q and I² tests were used to assess the heterogeneity of the studies. R software was used for the meta-analysis.

Results The study was based on a review of 19 observational studies published between 2001 and 2024 that examined the prevalence of negative childbirth experiences. The total sample size of the included studies was 73,353 women. Meta-analytic pooling of the prevalence of negative childbirth was 16% (95% CI: 10–22%). The evaluation of publication bias suggested a very strong likelihood of a small study effect due to the meta-analysis.

Conclusions Based on our study, the overall prevalence of negative childbirth experiences was calculated to be 16%. However, considering the short-term and long-term effects of this experience on various aspects of women's lives, greater attention should be paid to making pregnancy and childbirth more pleasant and to interventions to improve women's childbirth experiences.

Keywords Childbirth experiences, Pregnancy, Childbirth

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Introduction

Childbirth is considered one of the most profound and transformative events in a woman's life. Although all mothers experience initial biological changes, each mother perceives childbirth in her own unique way [1]. The overall experience that women gain from the childbirth process is a significant outcome that is highly complex, subjective, and based on personal judgment, and cultural, social, and environmental contexts and societal policies can also influence it [2]. Women in different cultures may vividly recall their childbirth experiences even after a long time [3]. The quality of these pregnancy and childbirth experiences and their related outcomes are among the factors that influence women's quality of life [4]. Of course, women's emotional and psychological well-being significantly contributes to their understanding and experiences of pregnancy and childbirth [5, 6]. Factors such as pregnancy-related complications, expectations, pain, and the nature of care and support all influence women's experiences of childbirth [7]. Contentment with the delivery process is regarded as one of the quality indicators of maternity services [1, 2], reflecting the system's ability to fulfill women's needs [8]. The World Health Organization (WHO) defines a positive experience of childbirth as "one that fulfills or exceeds a woman's prior personal and sociocultural beliefs and expectations, including giving birth to a healthy baby in a clinically and psychologically safe environment with continuity of practical and emotional support from a birth companion(s) and kind, technically competent clinical staff" [9]. A satisfying childbirth experience can lead to feelings of control, strength, and confidence in mothers [10]. It can also affect the health of the mother and the newborn, the emotional bond between them, and the desire for future childbearing [11].

The increase in the level of obstetric interventions during labor and delivery, prolonged labor, emergency cesarean sections, instrumental deliveries, and placing the mother in life-threatening conditions are significant risk factors for the occurrence of a negative childbirth experience [12]. The mother's situation leads to unresolved psychological tension in her mind, resulting in post-traumatic stress [13, 14]. This comes as studies have shown that women with a negative childbirth experience have a higher likelihood of postpartum depression [15] and difficulties in the attachment between mother and newborn [16]. In addition, a negative childbirth experience transfers the labor fear to the individual's subsequent pregnancies, leading to an increase in cesarean sections requested by the mother [17]. Overall, the negative aspects of the childbirth process require more time to integrate the mind and escape from turmoil [18].

Women who are dissatisfied with their childbirth experience, recalling their journey into motherhood as filled with pain, anger, and sorrow, often suffer from consequences such as anxiety, depression, reduced breastfeeding, and disruptions in sexual activities when reflecting on the experience [19, 20]. The type of delivery can significantly influence the psychological and physical effects of childbirth. A systematic study has shown that women who have undergone cesarean sections tend to have a more negative perception of childbirth [21]. Additionally, fear of childbirth has been identified as a risk factor for experiencing a negative birth outcome [22, 23].

Addressing declining and aging populations, many countries have adopted policies that encourage couples to have children. A key factor in deciding whether to pursue another pregnancy is the experience gained from previous childbirth [24]. Negative experiences and dissatisfaction with a prior birth can reduce the likelihood of a decision to have another child. Since no systematic study or meta-analysis was found on this topic during our review, this study aims to provide scientific evidence to inform strategies for improving women's childbirth experiences, enhancing fertility rates, and estimating the prevalence of negative childbirth experiences during labor and delivery.

Methods

The present study is based on the PRISMA checklist for systematic review reporting. The registration code for the study protocol is CRD42024549296.

Eligibility criteria of primary studies

A systematic search was conducted to find relevant studies in the databases PubMed/Medline (NLM), Scopus, Web of Science, Embase, ProQuest, and the Google Scholar search engine without applying any time or language restrictions. First, the keywords and synonyms for childbirth experience were found from the MeSh system, and the search syntax was developed by combining different synonyms through the OR operator. The search syntax was initially prepared for the PubMed database, and the adequacy of the syntax was tested. After the syntax was approved, the necessary adjustments were made for the other databases according to the guidelines of each database. A manual search was also performed to review the references of the included studies, similar review studies, and Google Scholar to find studies related to the objectives of the present study. The search strategy is detailed in the Supplementary file.

We included observational studies (cross-sectional, cohort, case-control) that reported the prevalence or frequency of negative childbirth experiences, focusing on studies that provided self-reported data. Additionally, the evaluation of women's childbirth experiences after delivery has been conducted in initial studies using researcher-developed questionnaires or standardized childbirth experience questionnaires (CEQ), childbirth perception scales, Wijma Delivery Expectancy/ Experience Questionnaire (W-DEQ), satisfaction with maternity care, Maternity Experiences Survey (MES), Perception of the childbirth experience (QACE). Review studies, intervention studies, qualitative studies, and theses were excluded. Studies for which full-text access was unavailable were also excluded. The main objective of this study is to estimate the prevalence of negative childbirth experiences, and the secondary objectives of this study include the prevalence of negative birth experiences based on the type of birth and number of pregnancies and identifying factors related to negative birth experiences.

Screening and selection processes

The study process was such that initially, the identified studies from each database were entered into EndNote software. Duplicate studies were identified and removed through software. Then, based on the title information and summary of the studies, the inclusion and exclusion criteria were initially screened. If the title and summary of a study were suitable in the initial review, in the next stage, the full text was evaluated more thoroughly by two researchers separately (N.M., E.B.). In a disagreement between the two reviewers, a discussion method was used to reach a unified conclusion. Ultimately, based on a two-stage review, the eligible studies were included in this systematic review.

Data extraction

Two researchers (N.M., E.B.) separately extracted data from the preliminary studies using a researcher-made form. The extracted surveys from the studies included the author's name and year, the location of the study, the type of study, sample size, average age of women, type of delivery, number of pregnancies, the questionnaire used to assess the childbirth experience, the prevalence or frequency of negative childbirth experiences, and the factors associated with negative childbirth experiences. In case of a conflict between two authors, the method of discussion was used to extract data to reach a unified conclusion.

Quality assessment (risk of bias assessment)

The quality of studies was evaluated using valid and reliable tools employed in systematic reviews of various prevalences. This tool was modified by Mann et al. (2015) based on the Joanna Briggs Institute (JBI) tool, suitable for studies that have reported prevalence. This tool evaluates 9 questions of studies in terms of the clarity of the sample, sample size, sampling method, reporting of participant characteristics, measurement methods, data analysis, and response rate. For each question, a score of 1 is given for a "yes" answer, and a score of 0 is given for a "no" or "uncertain" answer. The score of each study varies from 0 to 9. A score of 5 and above was considered high-quality studies [25]. This tool has been used in many systematic reviews and meta-analyses related to prevalence [26–28].

Data analysis

Data was analyzed using the Stata software version 17 and Meta package in R software and the Metaprop command. Considering the heterogeneity in the initial studies, a Random model and inverse variance type were used for the combination. The I² index and the Cochran Q test were used to assess the heterogeneity of the studies. An I² value of less than 25% is considered low heterogeneity, 25-50% is moderate, 50-75% is high heterogeneity, and more than 75% is considered very high heterogeneity [29]. A funnel plot and the Egger & Begg tests were used to assess publication bias in studies [30]. In case of a significant positive result, the trim and fill method was adopted to more accurately assess publication bias [31]. Sensitivity analysis was conducted to evaluate the impact of each study on the overall result using the leave-oneout approach [32].

Results

Study selection

Figure 1 presents the study's PRISMA flowchart. A total of 3,613 studies were identified through database searches, following each database's specific search strategy. After removing duplicate studies (n = 995), 2,618 studies were subjected to primary screening (titles and abstracts of these articles were assessed). After screening the title and abstract, 2,201 studies were excluded because they did not meet the purpose of the systematic study. Then, the full text of 417 studies was selected for analysis. During the full-text assessment phase, 318 studies were excluded because they did not meet the inclusion criteria. The reasons for exclusion were as follows: [1] Interventional studies without the reported prevalence of negative birth experience (59 interventional studies did not report the prevalence of negative birth experience) [2], Qualitative studies (36 studies had a qualitative design, precluding the extraction of data regarding the prevalence of negative birth experiences) [3], Non-compliance with primary outcome criteria (200 studies were excluded due to not meeting the defined criteria for the primary outcome-negative birth experience. These studies reported other outcomes, including fear of childbirth, birth experience in mothers with infants with congenital anomalies, birth experience in cancer survivor mothers, and birth experience in mothers with chronic diseases or genital warts), and [4] Other reasons (23 studies were excluded for reasons including



Fig. 1 Preferred reporting items for systematic reviews and meta-analyses (PRISMA) flowchart

being conference abstracts, not reporting the precise prevalence of negative birth experience, being systematic reviews, or being duplicates). After this process, 19 studies that met the inclusion criteria for the systematic review and meta-analysis were included.

Characteristics of the studies

The analysis was based on a review of 19 observational studies published between 2001 and 2024 that examined the prevalence of negative childbirth. The total sample size of the included studies was 73,353 women; the smallest sample size was 95, and the largest was 26,429 people. The mean age of the women was 29.06 years, and most of the studies were centered in Sweden [33–39]. Most of the included studies were designed cross-sectionally [33, 37, 38, 40–48], and two of the studies were retrospective cohorts [36, 49], whereas the others had a prospective design. The tool for measuring childbirth experience in

most studies was the Childbirth Experience Questionnaire (CEQ) [33, 34, 37, 38, 40, 42, 43, 45, 46, 48, 50]. In most of the studies, the time frame for measuring childbirth experience is 1 to 12 months after childbirth, and only two studies have evaluated women's experience after one year of birth [49, 51]. The evaluation of the quality of included studies also showed a low level of quality in four studies [35, 38, 42, 44] (Table 1, Supplement file).

Meta-analysis results

Meta-analytic pooling of the prevalence of negative childbirth was 16% (95% CI: 10–22%), with very high between-study heterogeneity ($I^2 = 99\%$, chi² = 1596.29, df = 18, p < 0.001) (Fig. 2). Due to the considerable heterogeneity in the overall composition of studies, subgroup analysis was performed based on the variables of study design, birth experience measurement tool, quality assessment score, postpartum birth experience

Authors (Reference)	Country /Year	Design of study	Measur- ing tool/ The study population	Sam- ple size	Age	prevalence of negative birth experience	Assessment point	Related factors	Score of qual- ity
Viirman, 2023	Sweden	Cross-sectional	Childbirth Experience Question- naire (CEQ)/ Only NVD	2953	31.1±4.4	Total: (n = 187/2953) 6.3% Primiparous: (n = 130/1421) 9.1% Multiparous: -	First days postpartum	perceived safety, followed by one's own capac- ity and participation	7
Walden- strom, 2004	Sweden	Longitudinal cohort	Childbirth Experience Question- naire (CEQ)/ primiparous and multipa- rous, NVD and CS	2541	29.5	Total: (n = 173/2541) 6.8% Primiparous: (n = 100/1096) 9.1% Multiparous: (n = 74/1445) 5.1%	3 weeks spread over 1 year after birth	First baby and mul- tiparas with a his- tory of an elective cesarean section or a negative previous birth experience, depressive mood in early pregnancy, dissatisfied with the support from their partner	7
Henriksen, 2017	Norway	Cohort	Wijma Delivery Expectancy/ Experience Question- naire (W-DEQ)/ primipa- rous and multiparous	1325	-	Total: (n=285/1325) 21.1%-	Mean time since last birth was 3.6 years	Fear of birth, a history of abuse, complications and lack of support	6
Ghanbari- Homayi,	Iran	Cross-sectional	Childbirth Experience Question- naire (CEQ)/ primiparous and NVD	800	30.8±4.9	Total: (n = 296/800) 37%	4 months after birth	Lack of exercise during pregnancy and the intrapar- tum and the fear of childbirth	9
Smaran- dache, 2016	Canadian	Cross-sectional	Maternity Experiences Survey (MES)/ pri- miparous and multipa- rous, NVD and CS	6,384	-	Total: (n = 591/6384) 9.3% Primiparous: (n = 305/2890) 10.5% Multiparous: (n = 282/3474) 8.1% NVD: (n = 366/4708) 7.7% CS: (n = 224/1676) 13.3%	Five to nine months after birth	Older age, violence, poor self-perceived health, prenatal classes attended, unintended preg- nancy, cesarean birth, and neonate admission to inten- sive care	7
Larsson, 2011	Sweden	Cohort	Wijma Delivery Experience Question- naire/ pri- miparous, NVD and CS	460	-	Total: (<i>n</i> =92/460) 20%-	3 and 9 months after birth	Pain, long hospital stay, worry in late pregnancy and high self-rated irritation	4

Table 1 Characteristics of studies included in the systematic review

Authors (Reference)	Country /Year	Design of study	Measur- ing tool/ The study population	Sam- ple size	Age	prevalence of negative birth experience	Assessment point	Related factors	Score of qual- ity
Adler, 2020	Finland	Retrospective cohort	Childbirth experience by visual analog scale (VAS)/ primiparous and multipa- rous, NVD and CS	18,396	31.8±5.0	Total: (n = 819/18396) 4.5% Primiparous: (n = 587/8639) 6.8% Multiparous: (n = 232/9757) 2.4% NVD: (n = 346/14489) 2.4% Instrumental vaginal birth: (n = 211/2180) 9.7% CS: (n = 262/1727) 15.2%	2 years after birth	Primiparity, labor in- duction, CS, opera- tive vaginal delivery, and maternal labor complications	8
Carlhall, 2022	Sweden	Retrospective population- based cohort	Childbirth experience by visual analog scale (VAS)/ primiparous and multipa- rous, NVD and CS	26,429	30.6±4.8	Total: (n = 1298/26429) 4.9% Primiparous: (n = 748/10739) 6.9% Multiparous: (n = 534/15489) 3.5% NVD: (n = 933/24149) 3.9% Instrumental vaginal birth: (n = 189/1418) 13.3% CS: $(n = 176/862)$ 20.4%	2 days after delivery	Longer time in active labor for both primiparous and multiparous women	8
Chabbert, 2021	France	Cross-sectional	Percep- tion of the childbirth experience (QACE)/ primiparous and multipa- rous, NVD and CS	256	31.5	Total: (n=59/256) 23.3%	1 to 6 days after childbirth	Role of the partner, mode of birth, high anxiety	4
Karlsdottir, 2017	Iceland	Cross-sectional	Childbirth Experience Question- naire (CEQ)/ primiparous and multipa- rous, NVD and CS	726	29.8±5.0	Total: (n = 38/726) 5.2%	Five to six months after birth	Pain, lack of support from midwife dur- ing childbirth; don't use of epidural analgesia	6

Table 1 (continued)

Table 1 (continued)

Authors (Reference)	Country /Year	Design of study	Measur- ing tool/ The study population	Sam- ple size	Age	prevalence of negative birth experience	Assessment point	Related factors	Score of qual- ity
Martins , 2019	Brazil	Cross-sectional	Childbirth experience by visual analog scale (VAS)/ primiparous and multipa- rous, NVD and CS	287	29.0±6.6	Total: (n = 7/287) 2.4% -	31–37 days after birth	-	4
Mukamurigo, 2021	Rwandan	Cross-sectional	Childbirth Experience Question- naire (CEQ)/ primiparous and multipa- rous, NVD and CS	817	27.8±5.6	Total: (n=136/817) 16.6%	8 weeks after birth	-	5
Mukamurigo, 2017	Rwandan	Cross-sectional	Childbirth Experience Question- naire (CEQ)/ primiparous and multipa- rous, NVD and CS	898	27.6±6.0	Total: (n = 202/898) 22.5%	1 to 13 months after birth	-	6
Nahaee, 2024	Iran	Prospective cohort	Childbirth Experience Question- naire (CEQ)/ primiparous, NVD, and CS	580	24±4.8	Total: (n=62/580) 10.6%	4 months and 4 years after the birth	Sexual satisfaction, postpartum compli- cations, mental health, and income	9
Nystedt, 2018	Sweden	Cross-sectional	Childbirth Experience Question- naire (CEQ)/ primiparous and multipa- rous, NVD and CS	928		Total: (n = 53/928) 5.7% NVD: $(n = 20/679)$ 2.9% Instrumental vaginal birth: (n = 8/84) 9.5% CS: $(n = 25/163)$ 15.3%	2 months after birth	Emergency cae- sarean and pain intensity	6
Rizk, 2001	United Arab Emirates	Cross-sectional	Satisfaction with mater- nity care/ primiparous and multipa- rous, NVD and CS	715	28.3±5.6	Total: (n=95/715) 13.2% -	3 months after birth	Age, Primiparity, higher education, lack of antenatal care and prolonged labor	5
Shiva, 2021	Sweden	Cross-sectional	Childbirth Experience Question- naire (CEQ)/ primiparous and multipa- rous, NVD and CS	95	24.0±3.9	Total: (n = 50/95) 52.6% -	2–6 weeks after birth	-	4

Table 1 (continued)

Authors (Reference)	Country /Year	Design of study	Measur- ing tool/ The study population	Sam- ple size	Age	prevalence of negative birth experience	Assessment point	Related factors	Score of qual- ity
Ulfsdottir, 2014	Sweden	Prospective cohort	Wijma Delivery Experience Question- naire/ Primiparous, NVD and CS	446	30.1±4.7	Total: (n = 152/446) 34.0% NVD: (n = 107/340) 31.4% Instrumental vaginal birth: (n = 27/63) 42.8% CS: $(n = 18/43)$ 41.8%	One of the first days postpartum	The long latent phase of labour, low Apgar score of the newborn at delivery	7
Vedeler, 2023	Norway	Cross-sectional	Childbirth Experience Question- naire (CEQ)/ primiparous and multipa- rous, NVD and CS	8317	30.0±4.8	Total: (n=917/8317) 11.0% -	First days postpartum	Disrespect and mis- treatment, insuffi- cient attention and lack of awareness of individual and emotional needs during childbirth	8
NVD: Natural CS: Cesarean	vaginal delivery section								
	Study	Event	s Total				Proportion 9	5%-Cl Weight	
	Rizk;2001 Waldenstrom Larsson;2011 Ulfsdottir;201 Smarandach Henriksen;20 Karlsdottir;20 Mukamurigo; Nystedt;2018 Ghanbari-Hoi	;2004 17 9 4 15 e;2016 59 17 28 17 28 17 3 2017 20 5 mayi;2019 29	7 715 3 2541 2 460 2 446 1 6384 5 1325 8 726 2 898 3 928 6 800 7 807		- - -		0.14 [0.11 0.07 [0.06 0.20 [0.17 0.34 [0.30 0.09 [0.09 0.22 [0.19 0.05 [0.04 0.22 [0.20 0.06 [0.04 0.37 [0.34	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	

Fig. 2 Forestplot showing of prevalence of negative childbirth

Random effects model

Prediction interval

Martins;2019

Chabbert;2021

Carlhall;2022

Viirman;2023 Vedeler;2023

Nahaee;2024

Mukamurigo;2021 Shiva;2021

Adler:2020

measurement time frame, and sample size to identify a possible source of heterogeneity.

Heterogeneity: $I^2 = 99\%$, $\tau^2 = 0.0158$, $\chi^2_{18} = 1596.29$ (p = 0)

287

95

26429

2953

8317

73353

0

0.1

0.2

0.3

0.4 0.5

580

18396

819

59 256

136 817

50

1298

187 917

62

Subgroup analysis for the prevalence of negative childbirth

The results of the subgroup analysis for the prevalence of negative childbirth are in Table 2. Subgroup analysis in the different scenarios was conducted with variables of the study design, birth experience measurement tool, quality assessment score, postpartum birth experience measurement time frame, and sample size. None of the potential subgroup variables was able to reduce the I² index. In terms of the effect of the subgroup on the prevalence of negative birth experience, in the subgroup related to the sample size, it was observed that in the studies with larger sample size and equal to 1000, the prevalence of the birth experience was 9%, which was a considerable decrease compared to the overall prevalence of the studies (Table 2 and supplement file S1-S5).

0.02 [0.01; 0.05]

0.53 [0.43: 0.62

0.05 [0.05; 0.05

0.06 [0.06; 0.07] 0.11 [0.10; 0.12]

[0.18; 0.29]

[0.14; 0.19]

[0.08; 0.13]

[0.10; 0.22]

[0.00; 0.43]

0.23

0 17

0.11

0.16

5.3%

5.4%

5 1%

5.3%

4.6%

5.4%

5 3%

5.4%

5.3%

100.0%

Sensitivity analysis and small study effect

0.6

Sensitivity analysis was performed using the leave-oneout method, in which at each stage, the impact of removing each study on the final result was examined. These

Subgroup variabl	les	Number	Prevalence	Confidence Interval	chi ² test (hetro- geneity <i>p</i> -value)	l ²	(p-value) test for interaction	
Type of scale	Childbirth Experience Question naire (CEQ)	- 10	17%	8–26%	< 0.001	98%	0.01	
	Wijma Delivery Expectancy(W-DEQ)	3	25%	16-34%	< 0.001	93%		
	Other	6	9%	3–18%	< 0.001	98%		
Score quality	>=5	15	14%	9–19%	< 0.001	99%	0.33	
assessment	<5	4	24%	4-44%	< 0.001	98%		
Point assessment	Under one month after birth	8	19%	8-30%	< 0.001	99%	0.73	
	1–12 months after birth	9	14%	7–21%	< 0.001	98%		
	More than a year after birth	2	13%	0-30%	< 0.001	100%		
Sample size	>=1000	7	9%	5-13%	< 0.001	99%	0.02	
	< 1000	13	20%	12-28%	< 0.001	98%		
Type of Study	Cros-sectional	12	17%	9–25%	< 0.001	98%	< 0.001	
	Longitudinal cohort or Prospec- tive cohort	5	18%	9–28%	< 0.001	99%		
	Retrospective cohort	2	5%	4–5%	0.02	81%		
All study		19	16%	10-22%	< 0.001	99%	-	
	Study Omitting Rizk;2001 Omitting Waldenstrom;2004 Omitting Larsson;2011 Omitting Ulfsdottir;2014 Omitting Smarandache;2016 Omitting Henriksen;2017		Prop	95%-Cl 0.16 [0.10; 0.22] 0.16 [0.10; 0.22] 0.16 [0.10; 0.22] 0.15 [0.09; 0.20] 0.16 [0.10; 0.22] 0.16 [0.10; 0.22]	P-value Tau2 Tau . 0.0168 0.1295 . 0.0163 0.1276 . 0.0167 0.1291 . 0.0145 0.1204 . 0.0165 0.1286 . 0.0166 0.1287	I2 5 99% 5 99% 99% 99% 5 99% 5 99% 5 99% 5 99% 5 99% 5 99%		
	Omitting Karlsdottir;2017 Omitting Mukamurigo;2017 Omitting Mystedt;2018 Omitting Ghanbari-Homayi;2019 Omitting Ghanbari-Homayi;2019 Omitting Adler;2020 Omitting Chabbert;2021 Omitting Chabbert;2021 Omitting Mukamurigo;2021 Omitting Shiva;2021 Omitting Carlhall;2022 Omitting Viirman;2023 Omitting Viedeler;2023 Omitting Nahaee;2024		****	0.16 [0.11; 0.22] 0.16 [0.10; 0.21] 0.16 [0.11; 0.22] 0.15 [0.09; 0.20] 0.17 [0.11; 0.22] 0.17 [0.11; 0.22] 0.15 [0.10; 0.21] 0.16 [0.10; 0.22] 0.16 [0.10; 0	0.0161 0.1267 0.0165 0.1283 0.0161 0.1270 0.0136 0.1166 0.0156 0.1249 0.0159 0.1263 0.0164 0.1281 0.0168 0.1290 0.0160 0.1265 0.0162 0.1273 0.0167 0.1291 0.0166 0.1290	7 99% 3 99% 3 99% 3 99% 3 99% 3 99% 3 99% 3 99% 3 99% 3 99% 3 99% 3 99% 3 99% 3 99% 3 99% 3 99% 3 99% 3 99% 3 99% 3 99%		
	Kandom effects model	0.2 -0.1 0	0.1 0.2	0.10 [0.10; 0.22]	. 0.0158 0.1255	99%		

Table 2 Subgroup analysis for the prevalence of negative childbirth

Fig. 3 Forestplot showing of influence analyses of each individual study on the pooled estimates of the primary goal (Sensitivity analysis)

analyses confirmed that the majority of the results were robust and independent of any single study (Fig. 3).

(6.3%, CI: 0-13.7%). Therefore, publication bias significantly affects the results obtained in this meta-analysis.

Funnel plot and Begg & Egger tests were used to evaluate publication bias. Based on the funnel diagram, there is a small study effect with a strong probability (Fig. 4). The results of Begg and Egger's linear regression tests with values Begg: Z = 1.96, p = 0.050 and Egger: t = 5.06, p < 0.001 also showed a significant publication bias in the results. Additionally, a trim-and-fill analysis for the prevalence of negative childbirth was done to reduce and correct publication bias in the studies (robustness of the results). The result showed eight studies were imputed for missing studies, and the estimated pooled prevalence was significantly different from the unadjusted prevalence

Secondary objectives

The secondary goals of the study were to determine the prevalence of negative childbirth experiences according to the number of pregnancies (primiparous and multiple births) and the type of delivery (natural, cesarean, and instrumental delivery). Based on this, the prevalence of negative birth experience in women with natural vaginal delivery with 5 studies [36, 37, 39, 49, 52] was 14% (95% CI: 3–25%) (Fig. 5), cesarean section with 5 studies [36, 37, 39, 49, 52] was 19% (95% CI: 12–26%) (Fig. 6), and instrumental delivery with 4 studies [36, 37, 39, 49] was



Fig. 4 Contour funnel plot for prevalence of negative childbirth



Fig. 5 Forestplot showing of prevalence of negative childbirth in natural vaginal delivery (NVD)



Fig. 6 Forestplot showing of prevalence of negative childbirth in cesarean section (CS)



Fig. 7 Forestplot showing of prevalence of negative childbirth in instrumental



Fig. 8 Forestplot showing of prevalence of negative childbirth in primiparous



Fig. 9 Forestplot showing of prevalence of negative childbirth in multiparous

17% (95% CI: 1–33%) (Fig. 7). The prevalence of negative birth experience among primiparous women was obtained with 5 studies [33, 34, 36, 49, 52] was 21% (95% CI: 0–45%) (Fig. 8) and among multiparous women with 4 studies [33, 34, 36, 49, 52] 12% (95% CI: 0–27%) (Fig. 9). However, in all these results, according to the indicators, the degree of heterogeneity was significant.

Discussion

The aim of the present study was a systematic and comprehensive assessment of the prevalence of negative childbirth experiences in women. Based on the results of a meta-analysis combining 19 studies and a total of 73,353 individuals, the prevalence of negative birth experiences was calculated to be 16%. Of course, the result obtained, considering the high level of heterogeneity and the very strong possibility of publication bias, is an inconclusive result. Based on the sensitivity analysis, the combined studies with high methodological quality also calculated the prevalence of negative birth experiences at 14%. Subgroup analyses considering various factors, such as study design, birth experience measurement tool, quality assessment score, postpartum measurement time frame, and sample size, did not reduce the heterogeneity (I²). Notably, studies with larger sample sizes (≥ 1000) showed a significantly lower prevalence of negative childbirth experiences (9%) compared to the overall pooled estimate, suggesting that sample size may play a role in reducing observed prevalence rates. These findings emphasize the importance of considering study design, sample size, and potential biases when interpreting the prevalence of negative childbirth experiences.

In a systematic study aimed at assessing the prevalence of negative childbirth experiences and the factors influencing them, the prevalence of negative childbirth experiences has been reported to range from 6.8 to 44% based on data from 8 studies [53]. Of course, the reported prevalence in this systematic study is based solely on the lowest and highest prevalence from the initial studies, without conducting a meta-analysis. Therefore, this is very likely the reason for the difference in results obtained in the current study. Another systematic study and meta-analysis aimed at estimating the prevalence of traumatic childbirth and post-traumatic stress following childbirth in Iran was conducted by Abdollahpour and colleagues in 2019 [54]. According to the results, the prevalence of traumatic childbirth in Iran is reported to be 51.3%, and the prevalence of stress following traumatic childbirth is 26.19%. Of course, this study was conducted regionally and shows the report of traumatic childbirth, while the present study has assessed the prevalence of negative childbirth experiences. Having a complicated delivery does not mean having a negative childbirth experience. Studies have shown that women who had adequate social support despite experiencing

complications during pregnancy and childbirth reported a positive birthing experience [55, 56].

Another result of the present study is the prevalence of negative birth experiences based on the type of delivery, which showed that the prevalence of negative birth experiences in women with a history of cesarean section was 19% higher compared to those who had vaginal or instrumental deliveries. The prevalence of negative childbirth experiences among first-time mothers was 21% higher than that of multiparous women. Of course, these results are from the secondary objectives of the present study, and in most initial studies, the overall prevalence of childbirth experiences has been reported without specifying the prevalence based on the type of delivery or the number of pregnancies. Therefore, the meta-analvsis of this section was conducted with a limited number of studies. Therefore, it can be an inconclusive result and should be interpreted with caution. In line with this finding, the study by Thaels et al. [57] also reported that women with planned cesarean sections or emergency cesarean sections have a lower chance of experiencing a positive birth. Chabbert et al. [58] also demonstrated that cesarean delivery is one of the factors influencing women's perception of their birthing experience. The results of the subgroup analysis in the systematic study by Sanjari et al. [59] showed that primiparous women had a higher fear of childbirth and lower satisfaction with childbirth compared to multiparous women. This result is also in line with the findings of the present study. The type of delivery and the number of pregnancies can act as mediating factors, with the fear of childbirth influencing women's childbirth experiences [60, 61]. In the systematic study by Kido et al. [62], it was reported that women who had a greater fear of childbirth experienced a worse birthing experience with the choice of cesarean delivery compared to natural childbirth. It has been consistently published in various studies that higher levels of fear are associated with adverse pregnancy and childbirth outcomes, as well as worse subjective experiences of labor [17, 63, 64].

The authors of this study identified several limitations that should be taken into account. Due to the limited number of initial studies, various tools with different scoring and ranking methods were considered for evaluating women's childbirth experiences in the criteria for entering this systematic review. It is worth mentioning that in the included studies, women's childbirth experiences were assessed at various time intervals after delivery, and due to the limited number of initial studies, it was not possible to restrict the time frame. On the one hand, the results of the present study, considering the level of heterogeneity indices and the outcome of the multiple assessments of publication bias, yield an inconclusive result; therefore, it should be approached with caution. However, an attempt was made to identify the potential source of heterogeneity by conducting subgroup analyses based on several variables. A potential source of heterogeneity may be differences in the demographic characteristics of study populations, including cultural, geographic, and socioeconomic factors. These variations could influence the experience of childbirth and may explain some of the discrepancies in reported prevalence. Ultimately, although a comprehensive search of the databases was performed, we may have missed some studies. This study has strengths such as a thorough and systematic search strategy, double-checking during the screening and selection of studies, data extraction, and quality assessment.

Conclusions

In general, our study showed that the prevalence of negative birth experiences was calculated to be 16%, based on a meta-analysis of 19 studies. The prevalence estimate in this systematic review and meta-analysis provides a reliable assessment of the childbirth experience in women, which should not be overlooked. Given the impact of childbirth experiences on maternal mental health, future research should focus on identifying targeted interventions to improve emotional outcomes during labor and post-delivery recovery. The findings suggest a need for comprehensive strategies to enhance maternal support systems, focusing on psychological support during childbirth, which could alleviate the long-term psychological burden associated with negative birth experiences.

Future research should focus on examining the effectiveness of specific interventions to reduce negative childbirth experiences, especially in populations with a high risk of trauma. The heterogeneity of the included studies limits the generalizability of our findings; therefore, more targeted studies are needed to assess the applicability of our findings in diverse settings.

Abbreviations

JBI Joanna Briggs checklists CS Cesarean Section NVD Natural Vaginal Delivery WHO World Health Organization Childbirth Experience Questionnaire CEO W-DEQ Wijma Delivery Expectancy/Experience Questionnaire MES Maternity Experiences Survey QACE Perception of the childbirth experience

Supplementary Information

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Supplementary Material 1

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Author contributions

M.B. and A.H. did the study design. N.M. and E.B. assessed the quality of the article and reviewed the final edition. Z.M. and M.D. contributed to the literature review. N.M. and E.B. reviewed and extracted the data. M.B. and A.H. took part in writing the manuscript, data analysis, and interpretation.

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Data availability

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

Declarations

Ethics approval and consent to participate

The study was approved by the Clinical Research Development Center, Motazedi Hospital, Kermanshah University of Medical Sciences (ethical code: IR.KUMS.REC.1403.122), and the study was conducted in accordance with the PRIMSMA.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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