



Relationship between Childbirth Experience and Childbearing Attitude: A Systematic Review and Meta-Analysis

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Abstract

Introduction: Childbirth is an experience that remains in the mind for years and can have many short-term and long-term consequences for women's health and reproductive attitudes. The present study was conducted to assess the relationship between childbirth experience and childbearing attitude.

Methods: A search was carried out in PubMed, Web of Science, Scopus, and search engine: Google Scholar using MeSH terms and their proper combinations via Boolean operators "AND" and "OR" operators according to each database over the years 2000 to 2022. We included published papers provided that they fulfilled all of the following criteria: Observational study (cross-sectional, case-control, and cohort), English language, investigating the relationship between pregnancy experience (positive/negative) and childbearing attitude (using questionnaires), and the participants being of reproductive age. The meta-analysis results were reported as odds ratio (OR) with a 95% confidence interval (CI). The I² index and Cochran's Q test were used to assess the heterogeneity of the studies. The quality of the included studies was evaluated using the Newcastle-Ottawa Scale (NOS). Egger's and Begg's tests were performed to evaluate publication bias, and the leave-one-out approach was used for sensitivity analysis. R package Meta was used for the meta-analysis.

Results: A total of 13,057 articles entered the screening and selection phase, and after implementing the main steps of the systematic review, six articles were ultimately accepted for the final review based on the eligibility criteria. The results of the meta-analysis of four studies with a high level of methodological quality demonstrated that people with negative or traumatic experiences in a previous pregnancy had 15% less positive attitude toward childbearing (OR=0.85; 95% CI: 0.50 to 1.45; I²=93%; Chi²=44.06, df=3, p < 0.01). Publication bias had no effect on the results obtained, and there was no significant bias in the publication of the results.

Conclusions: Given the association observed in the current study, the mother's negative childbirth experience can play a deterrent role in her future fertility-related decisions. In their plans to promote high-quality caregiving, healthcare providers should also focus on this component to improve women's childbirth experiences.

INTRODUCTION

Childbearing is an important phenomenon in social mobility and the foundation of sustainable development in countries with a low replacement rate [1]. Over the past several decades, the prevalence of childlessness and delaying pregnancy to after the age of 35 years have become global trends [2]. Iran has experienced a decline of more than 50% in its fertility rates. During 2003-2006, Iran has also joined the group of countries which have a replacement- or sub-replacement-level fertility (fertility rate: 1.7) [3], and this phenomenon will lead to some serious problems, such as labor shortage, which will have a negative impact on investments and the economy. Besides, society will soon face population aging and its associated problems [4]. Based on studies conducted on the decline in the total fertility rate, there is documented evidence of a change in fertility attitudes and behavior in our modern society [5]. A diminished desire for childbearing has thus also been added to the list of demographic problems and requires its specific solution [6]. Attitudes, subjective norms, perceived behavioral control, and social support for childbearing are among the factors affecting childbearing intention and behavior [7]. Attitude and behavior are intertwined in our daily lives. A change in attitudes can alter behaviors, and conversely, a change in behavior can affect one's attitudes. The relationship between attitude and behavior has been extensively studied in social psychology and behavioral sciences [8, 9]. It seems that changes in couples' fertility behavior may be due to some major changes in their attitudes toward childbearing [10].

Studies have shown that several individual, family, social, economic, and cultural factors affect childbearing behavior. Attitudes, subjective norms, hopefulness, and psychological factors such as marital satisfaction, social support, fear, and childbirth experience were among the significant predictors of childbearing intention [11, 12]. Childbirth and the experiences related to it have potential physical and psychological effects on women's life in the short and long term. According to studies, 33% of women report a negative or traumatic childbirth experience [13]. Several factors are related to the mother's positive and negative experiences of childbirth, including individual factors such as age, fear, and self-efficacy, interpersonal factors such as support from the spouse and healthcare provider, and unexpected medical problems, such as prolonged labor, stimulation and induction, emergency C-section, newborn's low Apgar score, and newborn's transfer to the NICU [13, 14]. Recent studies have found that women who perceive their childbirth experience negatively are more likely to report sleep disturbances and poorer self-rated health compared to those with unproblematic childbirth experiences. Additionally, a negative birth experience has been associated with a decreased desire for future

pregnancies [13-18]. In a qualitative study conducted in Iran, researchers explored the various elements that shape women's childbirth experiences. The findings revealed that several key factors significantly influence these experiences, including: (a) women's expectations of birth, (b) their involvement in the decision-making process, (c) the quality of the support they receive, and (d) their relationship with caregivers. However, women with negative birth experiences may develop fear for their next pregnancy, postpartum depression, and post-traumatic stress disorder [19]. Obstetric occurrences, including insufficient pain management during labor, complications during delivery that lead to emergency caesarean sections or assisted vaginal deliveries, as well as immediate postpartum issues such as haemorrhage, play a role in creating negative experiences during childbirth [20] and According to literature, mothers who have had negative experiences in a previous pregnancy are less inclined to have another child [15]. In one study, Ghanbari-Homayi et al. found that childbirth experiences can effectively change attitudes toward childbearing, childbirth and breastfeeding by influencing mental health and fear of childbirth [16]. In contrast with these findings, some studies, such as those by Laopaiboon et al. (2014) and Carlander et al. (2014), have not found a link between childbirth experience and parents' attitude toward having another child [17, 18]. There is thus a need for further research on this subject.

The authors found no systematic review and meta-analysis studies on the relationship between pregnancy experience and childbearing attitude between the years 2000 and 2022. Only one systematic review was conducted by Shorey et al. (2018) on the impact of negative pregnancy experiences on future reproductive decisions from January 1996 to July 2016 [19, 20]. In their study, they examined the negative outcomes of previous pregnancies in women aged 18 years and older, and reported birth spacing of five years from the previous pregnancy. The present study was thus conducted to determine the relationship between childbirth experience and childbearing attitudes.

METHODS

Design and Research

This study was first registered in PROSPERO (CRD42023388436) and a code of ethics was obtained for it from the Ethics Committee of Alborz University of Medical Sciences, Iran (IR.ABZUMS.REC.1401.327). The present study was conducted based on the PRISMA Systematic Studies Reporting System [21] and the research question was formulated based on the PECO (Population, Exposure, Comparison, Outcome) framework [22], in which P is the population of women, E is the pregnancy experience, C is non-existent (there

is no control group in the present study), and O is the childbearing attitude. The research question was: What is the relationship between pregnancy experience and childbearing attitude?

Study Selection Strategy

To access all the relevant studies, searches were performed in Databases: PubMed, Web of Science, Scopus, and search engine: Google Scholar using MeSH terms and their proper combinations via Boolean operators "AND" and "OR" according to the search strategy of each database over the years 2000 to 2022. A sample syntax for PubMed is presented below:

("Childbearing" [Title/Abstract] OR parturitions [Title/Abstract] OR parturitions [MeSH Terms] OR "reproductive decision-making" [Title/Abstract] OR "voluntary childlessness" [Title/Abstract] OR "delayed childbearing" [Title/Abstract] OR "Pregnancy" [Title/Abstract] OR "Pregnancy" [MeSH Terms] OR "reproductive issues" [Title/Abstract] OR "parenthood" [Title/Abstract] OR "fertility" [Title/Abstract] OR "fertility" [MeSH Terms]) AND ("Birth" [Title/Abstract] OR "childbirth" [Title/Abstract] OR "childbirth experience*" [Title/Abstract] OR "experience of childbirth" [Title/Abstract] OR "birth experience*" [Title/Abstract] OR "labor experience*" [Title/Abstract] OR "delivery experience*" [Title/Abstract] OR "maternal experience*" [Title/Abstract] OR "experience of mothers*" [Title/Abstract] OR "mother's experience" [Title/Abstract] OR "birth perception*" [Title/Abstract] OR "perception of birth*" [Title/Abstract] OR "childbirth perception*" [Title/Abstract] OR "perception of childbirth" [Title/Abstract]) AND ("Attitude" [Title/Abstract] OR "Attitude" [MeSH Terms] OR "Opinion" [Title/Abstract] OR "Perception" [Title/Abstract])) AND ((2000:2022/11/30 [pdat]) AND (English [Filter]))

Inclusion and Exclusion Criteria

We included published papers provided that they fulfilled all of the following criteria:

1) Observational study (cross-sectional, case-control, and cohort), 2) conducted from January 2000 to December 2022, 3) English language, 4) investigating the relationship between childbirth experience (positive/negative) and childbearing attitude (using questionnaires), and 5) the participants being of reproductive age.

The birth experience can be described in two different ways: The objective birth experience, referring to physical factors (e.g., caesarean delivery, vaginal assisted delivery, use of analgesia, home delivery) and the subjective birth experience, including personal emotions and attributions regarding the birth process (e.g., satisfaction with birth) [23].

Pregnancy experience was determined based on the participants' satisfaction with and positive/negative experiences of childbirth using corresponding questionnaires. Childbearing attitude was determined based on the decision about having another child or whether or not to delay the next pregnancy.

Exclusion Criteria

1) Lack of access to the full text of the article, 2) Qualitative studies, trials, mixed-methods studies, letters to the editor, 3) Irrelevance of the research subject, 4) Not using appropriate instruments to evaluate pregnancy experience or using a definition that differed from the concept under investigation, 5) Articles in languages other than English.

Screening Procedure

Two researchers independently searched the databases. In the screening phase, two researchers independently checked the titles and abstracts of the retrieved articles in terms of the inclusion and exclusion criteria. Duplicates and irrelevant studies were removed based on the eligibility criteria determined based on the study objectives. In the second screening phase, the full text of the articles was examined to ensure their relevance. The articles irrelevant to the objective of the research, duplicates, and article summaries without sufficient evidence, such as conference reports and lectures, were removed. The final articles were eventually examined in greater detail and their data were extracted (Figure 1). Some references mentioned in the selected articles were also examined. Any disagreement between the two researchers was resolved through discussions or by the arbitration of the third researcher. If the full text was not accessible, we tried to access the results and the article file by sending emails to the corresponding author.

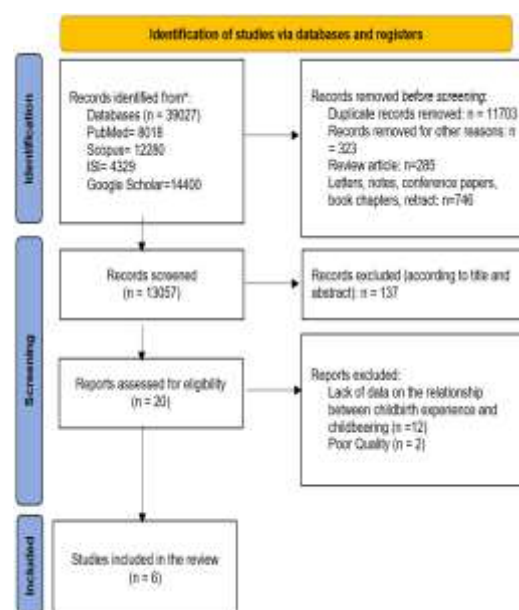


Figure 1. PRISMA flow diagram (2020)

Assessing Study Quality

To assess the quality of the articles and avoid bias, two authors (Z. M. & M. B.) independently evaluated the quality of the articles included in the systematic review based on the Newcastle-Ottawa Scale (NOS) for assessing the quality of observational studies. This scale has versions for cohort and case studies as well as a modified version for cross-sectional studies. This scale has items related to four domains (selection, exposure, comparability, and outcome). The scores of this scale range from 0 to 9, and scores higher than 6 indicate studies with high methodological quality [24].

Data Extraction

Two authors (Z.M. & M.B.) independently performed data extraction based on a researcher-made form. The first draft of the data extraction form was developed by Z. M. and then reviewed by M. B. and completed and revised after some discussion. The information extracted from the studies included the authors' names, year of publication, study setting, and type of study, sampling method, participants' mean age, sample size, data collection instruments, and the primary outcome.

Statistical Analysis

In the meta-analysis, the odds ratio (OR) was used to combine the results of the studies. This index was interpreted as follows for values less than 1: Trivial: 0.90-1; weak: 0.66-0.89; moderate: 0.50-0.67; strong 0.29-0.51; and very strong: <0.30 [25]. Given the expected variation in the primary studies, the random model and inverse variance were selected. The heterogeneity of the studies was evaluated using the I^2 index and Chi-squared (Cochran Q) test. An I^2 higher than 75% indicated high and significant, 25-50% moderate, and <25% low heterogeneity [26]. The results of Cochran's test also demonstrated significant heterogeneity with $P < 0.05$. The publication bias of the studies was assessed through Egger's and Begg's tests. In all the analyses, the significance level was <0.05 ; however, in Egger's and Begg's tests, due to the small number of studies, the significance level was $P < 0.10$. A sensitivity analysis was conducted to evaluate the impact of each study on the overall result using the leave-one-out approach [27]. R 4.2.1 and the metagen function of the meta package were used for the meta-analysis.

RESULTS

Study Selection

A total of 13,057 articles entered the screening, at first screening 11037 papers were duplicated so removed , 137 paper according title and abstract were removed and at third steps from 20 papers were entered in this phase , 14 papers because of Lack of data on the relationship between childbirth experience and childbearing or Poor Quality .were removed, and after implementing the main steps of the systematic review,

six articles were ultimately accepted for the final review based on the inclusion and exclusion criteria (Figure 1). The reasons for the ultimate exclusion of the articles were the lack of appropriate instruments to measure pregnancy experience (other concepts such as fear of childbirth, depression, PTSD), differences in the examined concept, and the lack of acceptable reporting of the results.

Characteristics of the Included Studies

In this systematic review, the total sample size based on the sample size of the included studies was 4169. As for the design of the studies, three of them were cohort [17, 28, 29], two were cross-sectional [15, 30], and one was longitudinal [23]. Among the cross-sectional studies, one study [15] used random sampling and the other one used online convenience sampling [29]. Two studies were conducted in the Netherlands [28, 30], two in Sweden [17, 29], one in Iran [15], and one in Israel [23]. Childbirth experience was evaluated via a questionnaire in four studies [15, 17, 23, 30] and via a single question about participants' experience of pregnancy and previous childbirth in two of the studies [28, 29]. In the four studies that used questionnaires to evaluate childbirth experience, two studies [15, 28] administered the standard Childbirth Experience Questionnaire, one study [30] used a researcher-made childbirth experience questionnaire, and one study [23] administered the Pregnancy and Childbirth Satisfaction Questionnaire. In the majority of the studies, childbirth experience was evaluated in the first few months post-delivery (the minimum and maximum postpartum evaluation time was 2 and 9 months). This period was longer only in one study [30], being 2.8 years on average. In terms of methodological quality assessment, all the included studies had high methodological quality based on their score above 6.

Individual Results of the Studies

Fifty percent of the studies confirmed the relationship between negative childbirth experience and childbearing attitude and desire to have another child [15, 23, 29]. In one study, unfulfilled expectations about and dissatisfaction with pregnancy and childbirth were associated with the decision whether or not to have another child [28]. Another study reported a relationship between traumatic childbirth experiences and delaying the next pregnancy [30]. The only study which found no significant relationship between negative experiences of pregnancy and the desire to have another child was the one by Carlander et al. [17] (Table 1).

Meta-analysis Results

After reviewing the results of the final six papers, only four were deemed eligible for the meta-analysis. Based on the combination of the four studies, the relationship between childbirth experience and attitude toward

childbearing was obtained with an OR of 0.85 (CI: 0.50; 1.45). In other words, women with negative or traumatic experience of previous pregnancies had 15% less positive attitudes toward childbearing, but this relationship was not significant. According to the magnitude of the heterogeneity indices ($I^2=93\%$ and

$P<0.01$, $\text{Chi}^2 = 44.06$, $\text{df} = 3$), there was significant heterogeneity when combining all the studies together. Due to the small number of studies, conducting subgroup analysis to identify the possible source of heterogeneity was not feasible (Figure 2).

Table 1. Details of the reviewed articles conducted on the relationship between childbirth experience and childbearing attitude and intention in 2000-2022

Authors (Reference)	Country /Year	Objectives	Study type	Sample size	Age	Estimate factor	Childbirth experience Measure/ Time to evaluate experience of birth	Results	Quality score
Cassé et al., [28]	Netherlands /2018	Parenting self-efficacy tested as a possible mediator between maternal experiences with childbirth and child rearing and their decision to have a second child	Cohort	796	19 to 42 years; $M=30.36 \pm 3.8$	Adjusted OR=1.69; CI=1.29: 2.24 Logistic model variables: Child gender, Maternal age, Education, Income, Birth expectations	One question examining first birth expectation (24) / 3 months after birth	Mothers who did not want a second child had more unmet expectations regarding childbirth. Psychosocial factors were the most effective factor that cause unmet expectations during parenthood and effect on next child bearing	7
Carlander et al., [17]	Sweden/ 2014	Investigating which factors related to the first birth influence the woman's subsequent reproduction within 5 years after birth	Cohort	451	$M=31.6 \pm 4.32$ No maintained age range	Spearman= -0.05 P value>0.05	Wijma Delivery Expectancy/Experience Questionnaire (W-DEQ) (34) / 9 months after birth	Circumstances in relation to the first birth, such as mode of delivery and a negative birth experience, did not affect subsequent reproduction	8
Gottvall et al., [29]	Sweden/ 2002	Investigate if experiences of the first birth, as assessed two months postpartum, had any impact on whether the women had another baby within the following years or not	Cohort	617	No maintained age range or mean Two groups: < 35; >35	RR=1.7; CI:1.3:2.3	One question asking about the overall assessment of labor and birth (26) / 2 months after birth	Women with a negative experience of their first birth had fewer subsequent children and a longer interval to the second baby	7
Ghanbari-Homayi et al., [15]	Iran/2021	Determining the proportion of negative childbirth experiences and its relationship with women's attitudes toward subsequent pregnancies and vaginal birth	Cross-sectional (random cluster)	668	Three groups: 18-25; 26-30; >31 No mention of the mean	Adjusted OR=0.43; CI:0.32:0.58; Logistic model variables: Husband's age, Education, Childbirth experience	Childbirth experience of Iranian women (CEQ) (35) / 1-4 months after birth	Negative childbirth experience was an independent predictor for women's unwillingness to have another child and give vaginal birth again	9
Preis et al., [23]	Israel/2020	Examining correlates of women's fertility intentions (desired number of children and desired intra-pregnancy interval) during pregnancy and following birth	Prospective longitudinal study	1163	$M=31.49 \pm 4.64$	Adjusted OR=0.82; CI: 0.65: 1.04; Logistic model variables: Religiosity, Education, Age, Parity, Fertility treatment, Emergency delivery, Birth satisfaction	Childbirth Satisfaction Scale (36) / 2 months after birth	Having a negative birth experience could adversely affect women's fertility intentions	6
Holopainen et al., [30]	Netherlands /2020	Explore which characteristics of the previous birth and trauma-related factors were associated with the subsequent birth experience	Cross-sectional (online)	474	$M=28.9 \pm 3.9$	Adjusted OR=0.86; CI: 0.76:0.97; Logistic model variables: Education, Housing status, Ethnicity, Age during traumatic childbirth, Parity, Childbirth experience	Woman's own subjective traumatic childbirth experience (27) / average of 2.8 years (0-10 years)	Time between the previous traumatic birth and the subsequent birth was significantly associated with the previous birth experience	6

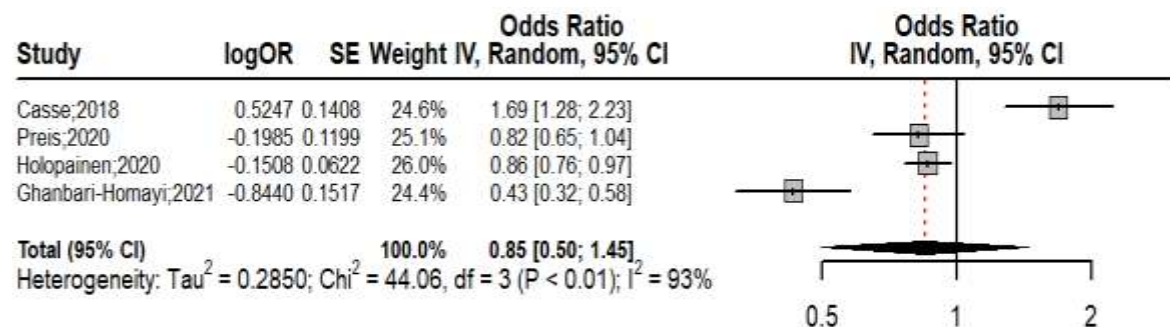


Figure 2. Forest Plot: Odds ratio with 95% confidence interval between childbirth experience and childbearing attitude

Table 2. Influence analysis of each study on the pooled estimate of the association between childbirth experiences and childbearing attitude

Removed studies	Odds ratio (OR)	Confidence interval (CI: 95%)	Heterogeneity index	
			Chi² test (P-value)	I²
Casse; 2018	0.68	0.44 to 1.04	0.077	88.9%
Preis; 2020	0.86	0.39 to 1.83	0.691	95.4%
Holopainen; 2020	0.84	0.38 to 1.82	0.663	95.5%
Ghanbari-Homayi; 2021	1.04	0.67 to 1.64	0.831	90.3%
All studies (without removing any study)	0.85	0.50 to 1.45	<0.01	93.0%

Publication Bias Assessment

The assessment of publication bias in the results based on Begg's test ($P=1.0$, $Z=0.0$) and Egger's regression test ($P=0.95$, $t=-0.06$) did not show any significant bias in the results; in other words, publication bias had no significant effect on the results.

Sensitivity Analysis

The impact of each study on the final results of the meta-analysis of all the studies combined was evaluated by the leave-one-out method. The results showed that leaving any study out did not cause significant change in its odds ratio (Table 2, Figure 3).

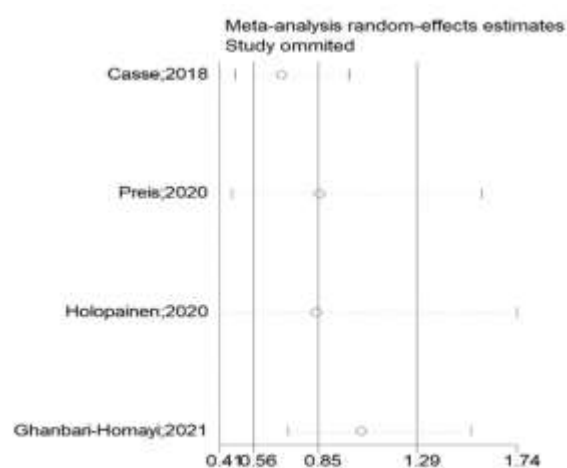


Figure 3. Influence analysis of each individual study on the pooled estimates of the primary goal

DISCUSSION

Over the last decades, childbearing has become one of the most critical health problems in all countries. The present study was a systematic review of the available evidence on the relationship between childbirth

experience and attitude toward childbearing. Based on the meta-analysis of four studies, women with negative or traumatic experiences in previous pregnancies had 15% less positive attitudes toward childbearing. In our study, a positive attitude toward childbearing was defined as the decision to have another child or to not delay the next pregnancy. Still, the data for this finding were not statistically significant, and since the OR was interpreted as weak and given the high degree of heterogeneity in the overall combination of the studies, this result could be deemed inconclusive. The negative experience of pregnancy and childbirth has been strongly linked to the fear of childbirth, and this fear is a negative psychological burden that can have a great impact on women's life [31, 32]. Childbirth experience is a complex and subjective issue based on one's personal judgment [33]. In addition, having childbirth-related complications does not necessarily cause a negative experience of childbirth in women. Studies have demonstrated that women with adequate social support report a positive childbirth experience despite having had complications in pregnancy and childbirth [34, 35]. We could not find any systematic reviews and meta-analysis studies on the relationship between childbirth experience and attitude toward childbearing in our search of literature. In their systematic study, Shorey et al. examined the relationship between negative pregnancy experiences and future fertility decisions. An objective of this systematic study was to evaluate the association between negative childbirth experiences and the decision to not have another child and to delay the next pregnancy. The search period was 1996-2016 and the quality of the studies was assessed using the Joanna Briggs Institute Critical Appraisal tools. According to the results of five studies, there was a positive relationship between negative experiences of childbirth and the decision to not have another child. Three

studies also reported a positive relationship between negative experiences of childbirth and delaying the next pregnancy [19]. This result is in line with the findings of our study. Nevertheless, our goal was different, as we aimed to assess the relationship between childbirth experiences and positive attitude toward childbearing. Moreover, the search period and the checklist for assessing the quality of studies also differed, and conducting a meta-analysis to combine the studies was also not possible. In another systematic review study, Hashemzadeh et al. examined 53 studies to evaluate the factors related to the attitude toward childbearing. The search period spanned from 1946 to 2017, but before the publication of the study, this period was updated and papers published in 2018-2021 were also added. The quality of the studies was evaluated using the STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) guidelines. The results of this systematic study were classified into several categories due to the extensive scope of its objective. One study had discussed women's previous childbirth experiences, and another study had reported their previous birth type as an indicator of their physical and mental health status and its relationship with the attitude to childbearing [36]. This part of the findings from the cited study is in line with the results of the current study, although the main purpose of the two studies differed.

Our study was a systematic review of the association between women's negative or traumatic childbirth experiences and their future childbearing decisions and attitudes. The limitations of this study included the loss of about 50% of the articles, which could have damaged the validity of the work. The childbirth experience variable was evaluated by the standard Childbirth Experience Questionnaire in only two of the primary studies, and another study had evaluated this variable using the standard Childbirth Satisfaction Questionnaire. In the rest of the studies, women's experiences were evaluated using a researcher-made questionnaire or with a single question. Another limitation of this systematic review was that only English articles were included, which could mean missing a relevant but non-English study. In the meta-analysis of the studies combined, the relationship between childbirth experience and childbearing attitude was weak and not statistically significant. Besides, due to the small number of included studies, it was impossible to perform subgroup analysis to identify the possible source of heterogeneity in the overall combination of the studies. Therefore, our results may be deemed inconclusive. Due to the limited number of studies on this subject, more primary studies are recommended on the relationship between childbirth experience and attitude toward childbearing in the future, so that a decision can be made about this association with certainty.

CONCLUSION

Overall, the results of our study revealed a relationship between previous childbirth experience and the attitude toward future childbearing, although in a statistically non-significant way. Women with a negative or traumatic experience in their previous childbirth had 15% less positive attitudes toward childbearing. Negative birth experiences could adversely affect women's childbearing intentions. It seems that the mother's experience of pregnancy and childbirth plays a major role in her psychosocial health and future fertility decisions. It is therefore imperative to enact policies and administer interventions to improve women's childbirth experiences and help them make better childbearing decisions. Health policymakers should focus on ameliorating this component in the plans to promote childbearing. Future studies are recommended to examine specific factors such as cultural and regional differences and the influence of childbirth experience.

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ETHICAL CONSIDERATIONS

Ethics approval for the study was obtained from the Ethics Committee of Alborz University of Medical Sciences, IRAN, (IR.ABZUMS.REC.1401.327).

CONFLICT OF INTERESTS

The authors declare that they have no competing interests.

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AUTHOR CONTRIBUTIONS

All authors contributed to the protocol. Z. M., M. B., and M. D. coordinated the review process. R. T. peer-reviewed the search strategy. Z. M., N. G., G. B., S. S. S., M. Y., M. D., and M. K. developed the search string and conducted the searches independently and selected papers for inclusion. Z. M. and M. B. assessed the quality of the included studies and extracted data. N. G. and G. B. documented the PRISMA flow diagram. Z. M., M. B., and D. M. performed the data analysis and drew the tables. All authors read and approved the final manuscript.

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