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Review Article

Journal of Current Trends in Nursing & Health Care

Impact of Prenatal Education Program Given By Midwives to Optimize the Development of the Labor, Delivery and Postpartum of Primiparous Women in Hospital Attention: A Systematic Review

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Received Date: 21 July, 2020
Accepted Date: 27 July, 2020
Published Date: 05 August, 2020

Citation: Rojas-Valenciano L, Brenes-Garita S, López-Quirós L (2020) Impact of Prenatal Education Program Given By Midwives to Optimize the Development of the Labor, Delivery and Postpartum of Primiparous Women in Hospital Attention: A Systematic Review. J Cur Tre Nur Health Care 1(1): 106

Abstract

Objective: The objective of the current review was to identify the impact of prenatal education program given by midwives to optimize the development of the labor, delivery and postpartum of primiparous women in hospital attention.

Methods: This systematic review, considered both experimental and quasi-experimental study designs including randomized controlled trials, non-randomized controlled trials, before and after studies, systematic reviews, analytical observational studies including prospective and retrospective cohort studies, case-control studies and analytical cross-sectional studies, published from 2014 to 2018. There was no language restriction. The databases to search included: PubMed, Trip Database, Web of Science, Scielo, Cochrane Library. Sources of unpublished studies and gray literature were included.

Results:A comprehensive search of the literature found 32 studies, including 1 duplicate. After screening the titles of the remaining 31 studies, 16 articles were excluded. After the full-text articles assessed for eligibility 1 was excluded. 6 articles were excluded after clinical appraisal. There are various educational forms and theoretical and didactic perspectives for the development of childbirth preparation course, and all seem to influence, in some way, the labor, delivery and postpartum health results.

Conclusion: This systematic review highlights the effectiveness of prenatal education programs. It also points out the importance of making more efforts to carry out more robust research on this subject and such a way that establish a universal prenatal program with theory scientific basis and methodological strategies that demonstrate a positive impact for the pregnant women, the childbirth and postnatal period, her partner participation and family, and provide to the couple with enough tools for resolve situations that can generate stress and conflict, all the above for the wellbeing of the baby and her family.

Keywords: Antenatal-education, Delivery, Midwives, Obstetric-Nurses, Postpartum-Period

Introduction

Maternity care has focused on the reduction of maternal and neonatal morbidity, leaving aside the beliefs of women and the expectations of care at the time of delivery. A study that assesses the influence of prenatal education classes led by midwives on women's birth preferences, was found. It is a multicenter, observational and prospective study, measuring variables of pregnant women who attended prenatal education classes in different health centers of the health districts of Valencia (Spain) during the year 2012.

The preferences of the birth plan were compared before and at the end of the classes. A total of 212 eligible pregnant women (78.3% nulliparous) with an average age of 31.39 ± 4.0 years accepted to participate in the study. There were significant differences in the preferences of the birth plan before and after the completion of the prenatal classes. Three items showed an increase between the initial session and the end of the intervention: the ability to spontaneously push, avoid episiotomy and early breastfeeding. An adjusted general linear model was used to compare the pre- and post-results in relation to sociodemographic and obstetric variables. Changes in birth plans may suggest that prenatal education classes influence the birth preferences of the mother [1].

Recently, Bergström and colleagues conducted a multicenter randomized trial in Sweden to compare two approaches to prenatal education [2]. Nearly 1100 nulliparous women were randomly assigned to a psycho-prophylactic education program for childbirth or a non-psychophysical general education program for childbirth and fatherhood. Parents of both groups participated in four 2-hour

sessions in groups of 12 (six mothers and their partners) during the third trimester of pregnancy. There were no differences in epidural analgesia rates, rates of elective and emergency caesarean sections, and parental stress during childbirth and paternity between these programs. The effects on other maternal and offspring outcomes were not presented. These results suggest that the program's differences in the theoretical background and in the focus on issues of childbirth or upbringing do not affect any objective or subjective outcome of the pregnancy.

Although well designed, the study by Bergström and his colleagues shows the difficulty of using randomized trials to assess the effects of non-pharmacological interventions that are already established in the practice of health care [2]. Almost 40% of the women assigned to the non-psycho-prophylactic education program used psycho-prophylactic techniques during childbirth. This contamination could be due to the information freely available in both programs and to educators who know both programs. It would seem impossible to do a similar study that includes a comparison group without prenatal education.

Sercekus and collaborators carried out a study whose objective was to examine the effect of antenatal education on fear of birth, maternal self-efficacy and maternal and paternal attachment [3]. It was a quasi-experimental study, comparing a prenatal education group and a control group. 63 pregnant women and their partners participated. For the collection of information, they used several instruments, among them: the rationale for the review in light of what is already known on the topic, including information that supports and justifies the selection of inclusion criteria. Key terms should be defined and operational definitions listed. Some indication that there is evidence available that will meet your inclusion criteria should be provided expectation/Wijma delivery experience questionnaire, the birth self-efficacy inventory, the maternal attachment inventory and the postnatal paternal-infant attachment questionnaire. Among their main findings are that prenatal education reduces the fear of childbirth and increases maternal self-efficacy related to childbirth. However, it was discovered that prenatal education has no effect on parental attachment. Therefore, researchers recommend for obstetric practice that the content of the educational program should be increased, including maternal and paternal attachment.

In 2010, a study was conducted in Ireland that explored the attitudes of first-time mothers towards prenatal education from the perspective of attendees and those who do not attend. From a qualitative design using interviews with focus groups with an intentional sample of new mothers, the authors point out that there are many strengths, weaknesses, opportunities and barriers for prenatal education. The strengths of prenatal education included the facilitator of prenatal classes, the information and preparation received, and the social aspect of the encounter with other pregnant women. Barriers to attending prenatal education included night shifts of work, no interest, transportation difficulties, inflexible employer and companion who does not attend. A departure from the teaching methods of teaching, it was identified as necessary a greater participation, and participation of parents [4]. In the previous study, for the implications of obstetric practice, fundamental aspects related to provision and prenatal education were identified. Participants identified the need for promotion and publicity of prenatal education. Mothers identified specific needs such as the provision of postnatal classes and peer tutoring, flexible availability of classes and facilitators that use the principles of adult learning to guide classes. The mothers alluded to the importance of the assistance and inclusion of the father in the classes. Therefore, it is imperative that the focus of prenatal education be focused on the parents and oriented towards the needs [4].

Another qualitative study was carried out in Sweden, using video or tape recordings, with a three-point content analysis approach, that is, conventional, summative and directed analyzes [5]. Three prenatal courses were taught in which 3 midwives and 34 course participants who were characterized as being new parents participated.

The content of the class focused on the preparation for childbirth (67% of the entire prenatal course) and on the preparation for the upbringing of the children (33%). The preparation of the delivery facilitated the understanding of the parents about the process of the childbirth, the environment of the childbirth, the function of the partner, what could go wrong during the childbirth and the advantages and disadvantages of the pain relief. The preparation for parents allowed the parents to plan those first moments with the newborn; take care/physically manipulate the baby; administer breastfeeding; administer the period at home immediately after delivery; and maintain your relationship. During classes, parents expressed concern about what might happen to newborns. Questions from parents to midwives and discussion topics between parents were evenly distributed between preparation for childbirth (52%) and preparation for parenting (48%).

Preparation for childbirth and pain relief consumed 67% of the time of the course. The parents reflected particularly on the problems, relationships, sex and anxiety of the children. Female and male participants actively listened to midwives, seemed receptive to complex problems and needed more time to ask questions. Parents appreciated the classes that were still needed to get more information to handle several post-partum situations.

Finally, the authors note5 that midwifery services vary between hospitals and countries; however, midwives can match the focus of course content, offer classes in the second trimester, provide more time for parents to talk to each other, allow time for the course plan for parents to discuss new topics, and investigate: ways in which the development and planning of the prenatal course can be improved; measures to evaluate courses; training of facilitators; and parent satisfaction surveys.

On the other hand, Nisbeth and Fage-Butler in an investigation carried out consulting groups of mothers in the prenatal period to obtain their understanding of whether and how peer learning is facilitated in the setting of childbirth preparation courses, point out that these group consultations Prenatal care can support learning, since individuals participate positively in both their own acquisition of knowledge and that of others [6]. They called that kind of peer-to-peer learning.

For the development of the research in question, the authors carried out semi-structured individual interviews with 16 women who had participated in group consultations at the University Hospital of Aarhus, Denmark, and analyzed the data through qualitative content analysis. Observations and patient data from guest books were also included.

Among the main results, it was found that women who were pregnant for the first time appreciated the experimental knowledge of the multiparous women of the group. The group consultations provided new learning opportunities, since the questions of the

individuals generated learning within the groups, as well as questions and answers. There was more time for reflection in the group consultations than in the dyadic communication. Midwives played a key role in facilitating peer learning.

As can be seen in the studies presented above, there are various educational forms and theoretical and didactic perspectives for the development of childbirth preparation courses, always with the intention of facilitating learning. However, other positions also point out the ineffectiveness of the same at the time of facing a labor of childbirth, childbirth and subsequent to it; so it is important to elucidate according to the best scientific evidence available which are the best educational options and if these really have a positive influence on the obstetric woman and the consequences for the newborn.

Prenatal education programs are integrated into current health-care practices in most middle-income and high-income countries [7]. Many of these programs have objectives and content that result in various ways of dealing with pain and illness. Stress during childbirth, increasing women's confidence in their ability to give birth, prepare women and their partners for childbirth and fatherhood, and develop social support networks [8].

"Millions of women around the world have been enrolled in structured prenatal education programs. The main reasons for women and their partners to participate in these programs are to obtain information about physiological changes during pregnancy and fetal development, to reduce anxiety and to learn how to care for the baby after birth"; including in some courses the attention of certain complications and description of birth options [9].

The courses of prenatal education or of preparation to the childbirth as they have been called in other occasions are based on two theoretical models: 1. The approach of the natural birth that Dr. Dick Read introduced in 1944, whose objective was to diminish the muscular tension induced for fear and cause birth pains. In 1948, Dr. López-Escobar introduces Dr. Read's method in Colombia; however, in 1937 in that same country, in private institutions, "easy delivery with a transfusion of trust" was practiced, according to what was suggested by the French obstetrician Marcel Metzgor [10].

On the other hand, in 1956, Lamaze ventures with the psycho-prophylactic method, which is mainly based on a relaxation as conditioned response to labor contractions, including breathing techniques to improve oxygenation and interfere with the transmission of painful signals from the uterus to the uterus, brain. Both Dr. Read's method and that of Dr. Fernand Lamaze work on physical fitness, the normal physiology of childbirth, the elimination of fear, the use of relaxation and breathing techniques, and the continual support of the expectant father or any other another family person [7,10].

The aforementioned methods become important because they are the basis on which many other methods, courses and prenatal education programs created afterwards are based.

"In the 1950s Robert Bradley proposed a teaching method for the couple to prepare for a natural birth, without medication, with an emphasis on nutrition, relaxation and breathing and where the couple will take the central role in childbirth. In the year 59 Dr. Read wrote his book "Childbirth without fear" that spoke about how fear, tension and pain and the importance of breathing, relaxation and continuous psycho-emotional accompaniment of the father, doula or nurse with the mother during childbirth" [11].

Various positions have also been handled over the past decades in reference to perinatal education, such as that of Sheila Kitzinger, an English anthropologist who motivates mothers to prepare themselves to learn about different options for childbirth and to make informed decisions. This author points out that the birth is an intimate and sexual experience and that the woman must have a more active action and not as a passive patient; On the other hand, it compares management and hospital care with that of giving birth in captivity [11].

Frederic Laboyer, showed that the emotional environment and trauma of birth has a profound impact on the life of the human being in the short and long term. It recommends the use of dim lights, the greatest possible silence, gentle movements on the part of the companions, the immediate skin-to-skin contact of the mother and her child. Other authors such as Michel Odent, mentioned by Alumbra, have written a lot about birth, about oxytocin called the love hormone that is secreted in an intimate and private environment, his writings have made a great contribution to perinatal education [5].

In more recent times, hypnoparty, created by Marie Mongan, is another method that promotes self-hypnosis techniques for relaxation and release of fear and stress.

Although prenatal education programs have been established in routine health care, only a few studies have evaluated effectiveness in the main results of childbirth and upbringing. For example, there is a Cochrane systematic review from 2007 that did not show a consistent effect of prenatal programs on any clinically relevant outcomes for delivery. Only trends towards better knowledge, confidence and parental competence in small studies were observed [12].

So far, affirmations of success and necessity seem not to be based on scientific reports, but on the strong beliefs of the future parents and, perhaps even more, of the health workers [7]. "One of the arguments against the classes of childbirth is that the information learned often comes out [through the window in the heat of the moment]. Some mothers claim that they do not hold much material when they are in the moment because they simply focus on overcoming the one-piece experience. The act of work can be an overwhelming experience. With the mixture of emotions and physical pain, sometimes your body can go into an overload and you can barely remember the name" [13].

On the other hand, it must be considered that women face childbirth with preconceived expectations, some of which are expressed in their birth plan. Health professionals could influence through prenatal education classes, although this has not been measured before. In the absence of a measurement on this issue, different positions and arguments against and in favor of the prenatal classes arise, since a resulting improvement in the birth experience has not been demonstrated, although some advantages can be seen: they favor communication and give time to express expectations and maternal beliefs 13. Other studies point to the positive determination regarding the birth provided by education in preparation for birth by reducing fear in parturients [14,15].

Costa Rica also has a similar behavior in terms of the application of the various prenatal education programs. Prenatal care includes

offering the preparation course for childbirth in the various health care centers, which is governed by the Technical Standards of Maternal and Perinatal Care of the Costa Rican Social Security Fund and the Ministry of Health [16]. These courses must be taught by obstetric nursing staff; However, not all establishments maintain this recommendation for obstetric nurses, since it depends on the institution and the rules that govern them, some courses can be taught by other types of personnel.

Other classes of preparation for childbirth are developed by private entities aimed primarily at first-time parents, but without any record of their effectiveness, although their informative pages indicate that they are based on the Lamaze technique and the Bradley method [17,18].

In Costa Rica, there is no data that demonstrate the effectiveness of the programs or courses of prenatal education. What the researchers have observed in their professional practice is that the parturient women do not show an introjection of the course they have done, given that their attitude and performance in certain cases do not favor neither their health or their baby´s.

A preliminary search of PROSPERO, MEDLINE, the Cochrane Database of Systematic Reviews and the Joanna Briggs Institute Database of Systematic Reviews and Implementation Reports was conducted and no current or underway systematic reviews on the topic were identified.

The proposed systematic review will be conducted in accordance with the Joanna Briggs Institute methodology for systematic reviews of effectiveness evidence. This review has been registered in PROSPERO with the No. CRD42018107827 and it is in the title register of the web of JBI.

Review Question/Objective

The objective of the review was to identify the impact of prenatal education program given by midwives to optimize the development of the labor, delivery and postpartum of primiparous women in hospital attention.

More specifically, the review question was:

What is known in the scientific literature regarding the impact of prenatal education programs taught by obstetric nurses for optimize the development of labor in primiparous women in the third level of care?

Methods

Inclusion Criteria

Participants: This review considered studies that include primiparous women.

Types of Factors/Exposure

This current reviewed considered studies that evaluate the impact of education program given by midwives to optimize the development of the labor, delivery and postpartum of primiparous women in hospital attention.

Outcomes

The main outcomes of interest were the prenatal education program taught by midwives, and the types of program educations, measured by scales of verbal rating scores (VRS) and questionnaire applied pre and post educative intervention. And the review considered the following secondary outcomes:

1. Perceptions of parents.
2. Type of information to the parents.
3. Physical and emotional maternal wellbeing.

Types of Studies

This review considered both experimental and quasi-experimental study designs including randomized controlled trials, non-randomized controlled trials, before and after studies, systematic review. In addition, analytical observational studies including prospective and retrospective cohort studies, case-control studies and analytical cross-sectional studies will be considered for inclusion. No restriction language. Studies published from 2014 to 2018, this timeframe was selected to capture more robust studies about prenatal education program.

Search Strategy

The search strategy was aim to locate both published and unpublished studies. A three-step strategy was utilized in this review. An initial limited search of MEDLINE and CINAHL was undertaken to identify articles on the topic followed by an analysis of the text words contained in the titles and abstracts of relevant articles, and the index terms used to describe the articles for developing a full search strategy. (see Appendix 1). A second search, including all identified keywords and index terms were adapted for each included information source. Third, the reference list of all studies selected for critical appraisal were screened for additional studies.

Reason for exclusion: qualitative study

The databases to search included: PubMed, Trip Database, Web of Science, Scielo, Cochrane Library. Sources of unpublished studies and gray literature were included: ProQuest Dissertations and Thesis and trial register. Other source: Journal of Gynecologic and Obstetric, Journal of Birth. The initial keywords were: prenatal education, antenatal education, impact of prenatal education, optimal development of labor, delivery and postpartum, participation of family in labor, delivery and postpartum, influence of antenatal education in delivery, prenatal education taught by midwives.

Following the search, all identified citations were collated and uploaded into Mendeley citation management, and duplicates removed. Titles and abstracts would then be screened by two independent reviewers for assessment against the inclusion criteria for the review. Potentially relevant studies would be retrieved in full and their citation details imported into the Joanna Briggs Institute's System for the Unified Management, Assessment and Review of Information (JBI SUMARI) 2019, (Joanna Briggs Institute, Adelaide, Australia) [19]. The full text of selected citations would be assessed in detail against the inclusion criteria by two independent reviewers. Reasons for exclusion of full text studies that do not meet the inclusion criteria would be recorded and reported in this current systematic review. Any disagreements that arise between the reviewers at each stage of the study selection process would be resolved through discussion, or with a third reviewer. The results of the search would be reported in full in the final systematic review and presented in a Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) flow diagram [20].

Assessment of Methodological Quality

Eligible studies were critically appraised by two independent reviewers at the study level for methodological quality in the review using standardized critical appraisal instruments from the Joanna Briggs Institute for experimental, quasi-experimental studies, and

systematic reviews (JBI SUMARI). Any disagreements that arise between the reviewers were resolved through discussion, or with a third reviewer. The results of critical appraisal were reported in narrative form. All studies, regardless of their methodological quality, was underwent data extraction and synthesis.

Data Extraction

After assessment of methodological quality was complete, data were extracted from studies included in the review by two independent reviewers using the standardized data extraction tool. The data extracted included specific details about the populations, study methods, interventions, and outcomes of significance to the review objective. Any disagreements that arise between the reviewers were resolved through discussion, or with a third reviewer.

Data Synthesis

The statistical pooling was not possible; the findings were presented in narrative form including tables and figures to aid in data presentation where appropriate. We used the following outcomes in subgroup analysis:

Primary outcomes: prenatal education program, and types of program.

Secondary outcomes: Perceptions of parents; Type of information given to the parents; Physical and emotional maternal wellbeing.

This involved the aggregation or synthesis of research findings to generate a set of statements based on assembling the quality-rated research findings and categorizing them by similarity. These categories were then subjected to a meta-synthesis to produce a single comprehensive set of synthesized findings.

Research findings reported in individual studies were extracted, as were supporting illustrations. Each research finding was assigned a level of credibility according to the JIB SUMARI module. The levels of credibility are as follows:

- Unequivocal (U) – findings that are accompanied by an illustration that is beyond a reasonable doubt and therefore not open to challenge.
- Credible (C) – an interpretation that is plausible in light of the data and the theoretical framework but can be challenged.
- Unsupported (US) – findings not supported by the data.

A sensitivity analysis was conducted to test decisions made regarding the presence of substantial heterogeneity, which may lead to the exclusion of the primary study and to confirm the results seen. We conducted sensitivity analysis for the primary review outcomes to determine whether the results are robust according to the decisions made during the review process.

This review was register in PROSPERO with the code CRD42018107827. Besides, was approved by the Vice-rectory of Research of the University of Costa Rica with the code B9335.

Results and Discussion

Study inclusion

A comprehensive search of the literature found 32 studies. After screening the titles of the remaining 31 studies, 16 studies were excluded. The full-text articles assessed for eligibility were 16, excluded 8 and included 6. (Figure 1).

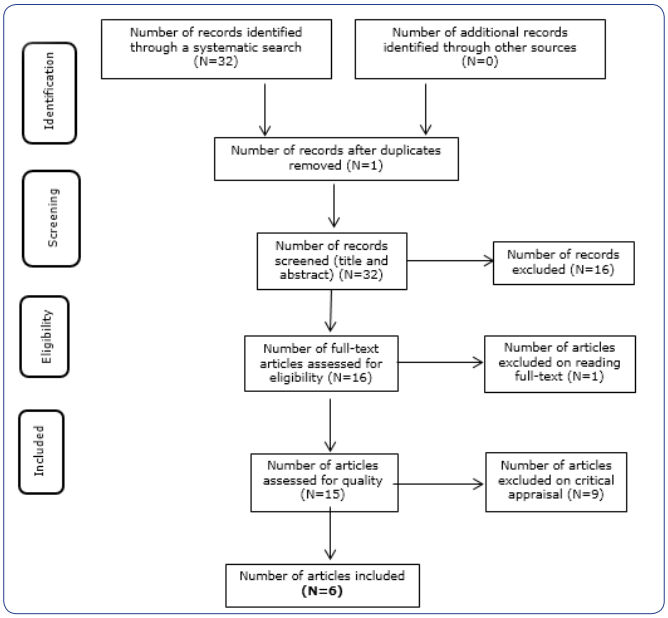

Figure 1: Description of studies

From: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 6(6): e1000097. doi: http://www.10.1371/journal.pmed1000097 [21]

For the methodological quality, two independent reviewers assessed the 15 studies, two is quasi experimental study, three randomized controlled trial, eight systematic review, one is cohort study, and one analytical cross sectional study. The disagreements between the reviewers were resolved through discussion, or with a third reviewer. The results of the quality assessment using the JBI SUMARI appraisal tools. The 15 studies analyzed, nine were excluded and only six articles were included for extraction and synthesis. The data of 15 studies assessed for quality are presented in table 1, 2, 3, 4, and 5.

Table 1: Assessment of methodological quality of included Randomized Controlled Trial

Citation	Q^1	Q^2	Q^3	Q^4	Q^5	Q^6	Q^7	Q^8	Q^9	Q^{10}	Q^{11}	Q^{12}	Q^{13}
Aba Yilda Arzu KN. 2017 [22]	Y	N	Y	U	U	U	Y	Y	Y	Y	Y	Y	N
Bergström M KH. 2011 [23]	U	U	Y	N	N	N	Y	Y	Y	Y	Y	Y	Y
Rania El-Kurdy SIH. 2017 [24]	Y	Y	Y	N	N	N	N	Y	Y	Y	Y	Y	U
%	**66.6**	**33.3**	**100.0**	**0.0**	**0.0**	**0.0**	**66.6**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**33.3**

Y= yes; N= no; U= unclear
Q^1 – Random allocation
Q^2 – Allocation to treatment groups
Q^3 – Treatment groups similar baseline
Q^4 – Blind to treatment assignment
Q^5 – Delivering treatment blind to treatment assignment
Q^6 – Outcome assessors blind to treatment assignment
Q^7 – Treatment groups treated identically other the intervention
Q^8 – Follow up complete
Q^9 – Participants analyzed in the groups
Q^{10} – Outcomes measure in the same way for treatment groups
Q^{11} – Outcome measured in a reliable way
Q^{12} – Appropriate analysis used
Q^{13} – Trial design appropriate

Table 2: Assessment of methodological quality of included Analytical Cross-Sectional Study

Citation	Q^1	Q^2	Q^3	Q^4	Q^5	Q^6	Q^7	Q^8
Buultjens M. et al. 2017 [25]	U	Y	Y	Y	Y	U	Y	Y
%	0.0	100.0	100.0	100.0	100.0	0.0	100.0	100.0

Y= yes; N= no; U= unclear
Q^1 – Criteria for inclusion in the sample clearly defined
Q^2 – Study subjects and the setting described in detail
Q^3 – Exposure measure in a valid and reliable way
Q^4 – Standard criteria used for measurement of the condition
Q^5 – Confounding factors identified
Q^6 – Strategies to deal with confounding factors stated
Q^7 – Outcome measured in a valid and reliable way
Q^8 – Appropriate statistical analysis used

Table 3: Assessment of methodological quality of included Quasi-experimental Study

Citation	Q^1	Q^2	Q^3	Q^4	Q^5	Q^6	Q^7	Q^8	Q^9
Kızılırmak A, Baser M. 2016 [26]	Y	Y	Y	Y	Y	Y	Y	Y	Y
Gökçe İsbir Gİ. et al. 2016 [27]	Y	Y	Y	Y	Y	Y	Y	Y	Y
%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Y= yes; N= no; U= unclear
Q^1 – Cause and effect
Q^2 – Participants included in any comparisons similar
Q^3 – Participants included in any comparisons receiving similar treatment/care
Q^4 – Control group
Q^5 – Multiple measurements of the outcome both pre and post the intervention/exposure
Q^6 – Differences between groups in terms of their follow up adequately described and analyzed

Q^7 – Outcomes of participants included in any comparisons measured in the same way
Q^8 – Outcomes measured in a reliable way
Q^9 – Appropriate statistical analysis used

Table 4: Assessment of methodological quality of included Cohort Study

Citation	Q^1	Q^2	Q^3	Q^4	Q^5	Q^6	Q^7	Q^8	Q^9	Q^{10}	Q^{11}
Cantone D. et al. 2017 [28]	Y	Y	Y	U	U	Y	Y	Y	Y	U	Y
%	100.0	100.0	100.0	0.0	0.0	100.0	100.0	0.0	100.0	0.0	100.0

Y= yes; N= no; U= unclear
Q^1 – Two groups similar and recruited from the same population
Q^2 – Exposures measured similarly to assign people to both exposed and unexposed groups
Q^3 – Exposure measured in a valid and reliable way
Q^4 – Confounding factors identified
Q^5 – Strategies to deal with confounding factors stated
Q^6 – Groups/participants free of the outcome at the start of the study
Q^7 – Outcomes measured in a valid and reliable way
Q^8 – Follow up time reported and sufficient to be long enough for outcomes to occur
Q^9 – Follow up complete, and if not, were the reasons to loss to follow up described and explored
Q^{10} – Strategies to address incomplete follow-up utilized
Q^{11} – Appropriate statistical analysis used

Table 5: Assessment of methodological quality of included Systematic Review and Research Syntheses

Citation	Q^1	Q^2	Q^3	Q^4	Q^5	Q^6	Q^7	Q^8	Q^9	Q^{10}	Q^{11}
Entsieh A, Hallström I. 2016 [29]	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Gilmer C. et al. 2016 [30]	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Amin NA. et al. 2018 [31]	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Moghaddam Hosseini V, Nazarzadeh M, Jahanfar S. 2018 [32]	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Mehtap Akgün, Ilkay BOZ. 2019 [33]	U	U	U	U	U	U	U	U	U	U	U
Emi Mori. et al. 2019 [34]	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N
Brixval C. et al. 2015 [35]	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Y= yes; N= no; U= unclear
Q^1 – The review question clearly and explicitly stated
Q^2 – Inclusion criteria appropriate for the review question
Q^3 – Search strategy appropriate
Q^4 – Sources and resources used to search for studies adequate
Q^5 – Criteria for appraising studies appropriate
Q^6 – Critical appraisal conducted by two or more reviewers independently
Q^7 – Methods to minimize errors in data extraction
Q^8 – Methods used to combine studies appropriate
Q^9 – Likelihood of publication bias assessed
Q^{10} – Recommendations for policy and/or practice supported by the reported data
Q^{11} – Specific directives for new research appropriate

Review Findings

Table 6 provided descriptions of the characteristics of participants, sample size and the measure scales applied in the six studies included in the current review. The first four studies are systematic review and the following two are quasi-experimental studies [26,27,29,30,31,35].

Table 6: Characteristics of the included studies

Study	Setting	Objective	Participants	Sample size	Measure
Kızılırmak A, Baser M. 2016 [26]	Turkey, at a maternity hospital in a city of middle region. Data were collected between 24th of March and 13th of May in 2010	To determine the effect of education that is given information about the delivery room, labor and coping strategies with the fear of pain of childbirth in primigravida women.	Primiparous women between 28–34 gestational weeks	A total of 99 women; 50 in study group and 49 in the control group	Expectancy/ Experience Questionnaire (W-DEQ), version A.
Gözde Gökçe İsbir et al. 2016 [27]	Turkey. Data were collected between December 2013 and May 2015, in Anatolia region.	To examine the effects of antenatal education on fear of childbirth, maternal self-efficacy and PTSD symptoms following childbirth.	Nulliparous women, between 20 and 32 weeks' gestation.	A total of 90 women, 44 in the study group and 46 control group	Wijma Delivery Expectancy/ Experience Questionnaire, Version A and B Childbirth Self-efficacy Inventory Impact of Event Scale–Revised
Gilmer C. et al. 2016 [30]	Canada. Public Health and Universities of Canada, Nurturign the Next Generation Reaserch group	To identify potentially effective new-parenting education interventions that could be implemented at a population level during the transition to parenthood period.	Parents during pregnancy and up until the end of the first year of a child's life	13 systematic reviews/meta-analyses, 34 intervention studies, 9 opinion papers, 8 programme reviews, and 8 grey literature reports.	Survey Action research Qualitative Descriptive
Amin NAL, Tam W, Shorey S. 2018 [31]	Singapore.	To synthesise available evidence and explore the efficacy of universal parent education interventions on the parental self-efficacy of first-time parents.	A universal population of first-time biological parents (fathers or mothers) of a newborn. Studies of interventions offered only to a selected group of parents, including those offered only to adolescent or teen parents aged under 18 years	A total of 1504 participants, conducted across seven countries in Asia, Australia and United States of America.	Parental Self-Efficacy Scale Parental Sense of Competence Maternal Confidence Questionnaire
Entsieh A, Hallström I. 2016 [29]	Sweden, England, Ireland, Australia, Switzerland, Turkey, and Singapore.	To contribute to the existing body of knowledge about the specific needso f first-time parents specifically for early parenthood	First-time expectant and new parents with regards to early parenthood, above 18 years.	A total 916 particpants, from 8 different study locations including, England, Sweden, Ireland, Australia, Switzerland, Turkey, and Singapore	Semi-structured interviews Constant comparative methods Longitudinal, multiple-source, multiple methods design Interviews Longitudinal, mixed-method needs assessment. Interviews

Brixval C. et al. 2015 [35]	Countries in the Western world - defined as OECD membership countries	Assess the effectiveness of antenatal education in small classes on obstetric and psycho-social outcomes compared to standard care or other types of educational programs using randomized trials from Western countries.	pregnant women and/ or their partners	A total of 6,507 randomized women and 961 men, with a range from 74 to 1,193 participants per trial.	Intervention effect for outcomes measured more than one time during follow-up Dichotomized result (RR) for outcomes measured by the same measurement tool at the same time point

Source: Data of studies included, 2020.

In two studies, the participants were primiparous and nulliparous women, in the other four studies a universal population of first-time biological parents, first-time and new parents, and future preterm parents, parents during pregnancy and up to the end of a child's first year of life, and pregnant women and/or their partners [26,27,29,30,31,35].

Regarding the number of participants in two of them, it was between 90 and 99, and in the others, a greater total number of participants was quantified (1504; 916; 6507) since they were systematic reviews. As measurement instruments they applied interviews and questionnaires with different scales; for example, parental self-efficacy scale, sense of parenteral competence, maternal confidence questionnaire, and the effect of the interventions was measured [26,27,29,30,31,35].

The review by Amin, Tam, and Shorey evaluated two categories of results: a) post-intervention (up to four weeks after the end of the intervention) and b) short-term follow-up (up to six months after the end of the intervention) [31]. For the first result, the studies were classified according to the periods of participation in the program; four studies consisted of interventions lasting ten weeks or less, and three studies consisted of interventions lasting more than ten weeks.

Results revealed that longer interventions showed a more significant change (SMD 0.71, 95% CI 0.54 to 0.89; z = 7.93, p <0.001) than shorter interventions (SMD 0.41, 95% CI 0.23 to 0.60; z = 4.36, p <0.001). No heterogeneity was found in both subgroups of brief interventions (p = 0.71, I2 = 0%) and long durations (p = 0.45, I2 = 0%). Subgroup differences were statistically significant (p = 0.02, I2 = 80.7%). The authors point out that the longer the duration of the intervention, the greater the improvement in confidence, competence, and self-efficacy (PSD). For their part, three studies evaluated short-term follow-up and whether PSE conditions were sustained over time; It was observed that these educational interventions for parents improved significantly (SMD 0.61, 95% CI 0.27 to 0.95; z = 5.73, p <0.001), but with evidence of significant heterogeneity using a random-effects model (I2 = 65%, p = 0.06)

Gilmer developed a review, which consisted of the evaluation of thirteen systematic reviews or meta-analyses [30]. These reviews focused on topics such as low-income families transitioning to parenthood, new parents whose children have behavior problems, faith-based programs that support new parents, new parenting programs that use video presentation formats or novel audio, or new parenting programs targeting specific problems or subpopulations. Much of the research was based on convenience samples from parents who attended and, in many cases, only from those who attended the final class. The challenges of parental dropout are discussed for a dropout rate range between 42-95%. Control and / or missing conditions and dropout of participants limited conclusions that could be drawn directly from the studies.

The study by Entsieh and Hallström identified five themes: (1) Partner involvement, (2) Early and realistic information about parenting skills, (3) Looking for a shoulder to lean on, (4) Managing the relationship of partner and (5) learning strategies. The meta-synthesis included 12 articles from qualitative studies. The total number of study participants was 916. Findings that were unique to each of the reports were only included if they were supported by other studies [29].

Kizilirmak and Başer, develop an experimental design with pre and post-test and a control group to determine the effect of education on fear of childbirth in primiparous women [26]. The sample size was based on the mean score and standard deviation of labor-related concerns. A score of 6.9 was accepted, the standard deviation was taken as 1.7, and also with this education, the average score is hypothesized as a decrease of 1 point. The minimum sample size was calculated at 48 for the study and control groups with α: 0.05, β: 0.20. 188 pregnant women were admitted to the hospital (94 in the control group and 94 in the experimental group). The women in the study group were educated after collecting the data from the control group to avoid interaction between both groups. Sociodemographic data included age, education and occupational status, income level, residence, and family type. Obstetric data included the number of pregnancies, the desired pregnancy, and the support of family members during the pregnancy.

Sociodemographic data included age, education and occupational status, income level, residence, and family type. Obstetric data included the number of pregnancies, the desired pregnancy, and the support of family members during the pregnancy. Their demographic and obstetric data were investigated in terms of the effect on fear of childbirth.

To assess the feelings, opinions, and experiences of pregnant women about labor, version A of the Wijma questionnaire (W-DEQ) was applied. An educational guide to childbirth preparation was planned to reduce pregnant women's fear of childbirth and anticipate a successful delivery using Bandura's social cognitive theory.

The main topics in the educational training were the characteristics of the delivery and delivery room, routine practices in the delivery

and delivery room, and information about delivery. Some photos of mothers and babies and educational posters related to the birth were hung in the space selected to provide the education. A computer with a CD driver and a woofer system and birth models were used as educational materials. PowerPoint presentations were taught and then discussed, as well as videos and some skills development skills. The education was delivered after periodic physical exams in two sessions on the same day. The first session lasted 40 minutes while the second session lasted 30 minutes. A 10-minute break was given between the two sessions.

In the study by Gözde Gökçe İsbir, the effects of prenatal education on fear of childbirth, maternal self-efficacy, and post-traumatic stress disorder (PTSD) symptoms after childbirth were examined [27]. It was a quasi-experimental study. To be included in the study, mothers were required to be nulliparous, to be between 20 and 32 weeks of gestation, to have no history of complications in pregnancy, to have their pregnancies considered high risk, and attend no other prenatal program. The intervention group consisted of women who volunteered to participate in the study under the condition of "usual care", and the control group was made up of women who received regular prenatal care in an outpatient maternity clinic of the same hospital. Regular prenatal care visits take 10-15 minutes and consist of collecting medical information, physical examination and ultrasound, and prenatal education are not offered, as prenatal education classes are not part of routine care in the region.

The number of participants required for each group was determined based on a significance level of 0.05, and assumed differences of means (15.20) and standard deviations (12.39) in the data collection tool for PTSD symptoms after delivery. To achieve a study power of 80%, each group had to include at least 31 participants. To account for potential loss to follow-up, 50 participants were assigned to each group, for a total of 113 women invited to participate with a response rate of 88.4%.

The content and structure of the prenatal education class were based on Dick-Read's "natural work", Lamaze's "psychoprophylaxis", Balaskas' "active birth" and Mongan's "hypnopartum" philosophy.

The sessions in the intervention group were carried out using mannequin simulators, animation videos, role plays, and slide shows. The sessions were led by the researchers, who had previously participated in childbirth education courses and courses in rational, emotional, and cognitive-behavioral theory. Some data were obtained from medical records. Women completed the second set of questionnaires 6 or 8 weeks after birth on home visits (intervention group: 43.6 ± 7.9 days, control group: 42.4 ± 6.3 days, p N .05). The questionnaires applied were in the prenatal period: the Wijma Delivery Expectancy / Experience Questionnaire, Version A (W-DEQ-A) designed to assess women's feelings, and fear of childbirth; the Childbirth Self-efficacy Inventory (CBSEI) questionnaire which has two subscales: the expectation of results and expectation of efficacy. In the postnatal period, the same questionnaires were applied, and also, the Impact of the Revised Event at Scale (IIES-R) to measure PTSD.

Finally, Brixval carried out a systematic review to evaluate the effects of prenatal education in small groups on obstetric and psychosocial outcomes [35]. The experimental condition was a prenatal education program offered by an educator to groups consisting of more than one individual/couple but including fewer than 20 individuals, related to childbirth and/or preparation for parenthood. Control conditions in the included trials were standard care. In cases where two programs were compared, the most intensive was considered the experimental intervention. Co-interventions were only allowed if the intervention was administered equally in both the experimental and control groups. The following were analyzed as the primary outcome: pain relief during labor, obstetric interventions, psychological and social adjustment to parenthood, prenatal and postnatal depression and anxiety. Secondary outcomes were as follows: knowledge acquisition, maternal sense of control / active decision making during labor and delivery, partner involvement at birth, breastfeeding success, childcare skills, social support, satisfaction with the relationship, divorce/separation.

In table 7, the authors describe the characteristics of the prenatal programs education, and the main results in the included studies.

Table 7: Characteristics of the prenatal programs education, and main results in the included studies

Study	Description Prenatal program	Assessment period	Main results
Kızılırmak A, Baser M. 2016 [27]	The main subjects of the program were: characteristics of the labor and delivery room, routine practices in the labor and delivery room and information about labor. A computer with a CD driver and woofer system and birth models were used as education materials. Telling, discussing, power point presentations, videos and some techniques directed at skill development were used during the education. Intervention was given in two sessions on the same day, first session lasted for 40 minutes while the second session lasted for 30 minutes. A 10-minute break was given between the two sessions. In the first interview education for preparation to delivery was given. In the second interview theW-DEQ-A was administered in a face to face interview.	Between 24th of March and 13th of May in 2010	In the first interview session, no significant difference was found between W-DEQ-A scores of the study and control groups. The mean pre-education W-DEQ-A score was 61.1 while it was 42.0 post-education in the study group. The post-education W-DEQ-A score was 58.5 in the control group while it was 42.0 in the study group.
Gökçe İsbir Gİ. et al. 2016 [27]	Classes were based on Dick-Read's "natural labor", Lamaze's "psychoprophylaxis", Balaskas's "active birth" and Mongan's "hypnobirthing" philosophy. Using simulator mannequins, animation videos, role-playing and slide presentations. Led by the authors, who had previously participated in Childbirth Educator Courses, and Rational, Emotive & Cognitive–Behavioral Theory Courses. Groups consisted of 5–8 women. Course consisting of 16 hours of instruction split into four 240-minute weekly sessions. Each session included presentation of theoretical information for 150minutes, warm-up and stretching exercises for 45 minutes and relaxation exercises for 45 minutes. Content: • 1st week: Raising awareness of fear of childbirth; Strategies to cope with fear of birth • 2nd weekPsychological and physiological and adaptation to birth • 3rd week: Understanding birth, Having a sense of control over birth • 4th week: Positive appraisal of birth, Preservation of positive, birth memories	Between December 2013 and May 2015	1.*Childbirth self-efficacy and fear of birth in pregnancy before the intervention*: There were no significant differences in childbirth self-efficacy scores, outcome expectancy score, efficacy expectancy score and fear of birth in pregnancy score noted between the groups. 2. *Childbirth self-efficacy and fear of birth in pregnancy in the intervention group before education and after education*: The differences in childbirth self-efficacy scores, outcome expectancy scores, efficacy expectancy scores and fear of birth in pregnancy scores were significant. 3. Comparison of fear of birth postpartum, and PTSD symptoms following childbirth between the intervention and control groups in the postpartum period: Women in the intervention group had significantly lower PTSD symptoms following childbirth than women in the control group in the postpartum period

Gilmer C. et al. 2016 [30]	No program was developed	Seventy-two papers informed this review: 13 systematic reviews/meta-analyses, 34 intervention studies, 9 opinion papers, 8 programme reviews, and 8 grey literature reports.	Here was no compelling evidence to suggest that a single educational program or delivery format was effective at a universal level. Some inherent issues were identified. For example, adult learning principles were overlooked and theories of parent–child interaction were not in evidence. No direct links between universal new-parent education programs and child development outcomes were established. Program reach and attrition were key challenges. Program evaluation criteria were inconsistent, with an over-reliance on parent satisfaction or self-reported intention to change behavior. There was evidence that effective facilitators helped increase parents' perceived satisfaction with programs.
Amin, Tam, Shorey. 2018 [31]	No program was developed.	Ten randomised controlled trials were selected; eight trials were combined in meta-analyses and two trials were synthesised narratively.	A meta-analysis revealed that universal parent education interventions significantly enhanced parental self-efficacy ($p < 0.001$) among first-time parents and these effects were also maintained over time ($p < 0.001$). The extent of improvement in parental self-efficacy was affected by the duration of the interventions.
Entsieh, Hallström. 2016 [29]	No program was developed	The meta-synthesis included 12 articles representing 12 studies. The meta-ethnographic approach of Nobilt and Hare was used in the meta-synthesis.	First-time expectant and new parents reflect a need for antenatal education to actively include male partners pre- and postnatal. Participants wished for early and realistic information about parenting skills, and to have the opportunity to seek support and help from health professionals when need arose especially during the early postnatal period. Another element was the need to learn both from peers and other new parents coming as guest speakers. Participants wished to have been well informed ahead of time, about the possible changes in their conjugal relationship and the related coping strategies.
Brixval C. et al. 2015 [35]	Antenatal educational program offered by an educator to groups consisting of less than 20 individuals and control groups with standard care, individual care only or other types of educational programs, antenatal education programs with a smaller intervention. The amount of education in the experimental condition varied from a single 1-h session to 24 sessions each. Focused on prevention, depression-preventive program psycho-social prevention group-based antenatal training breast feeding sessions.	Between 1988 and 2014	The high risk of bias of studies, make unable to draw definitive conclusions as to the impact of small group antenatal education on obstetric and psycho-social outcomes.

Source: Data of studies included, 2020.

The study of Kizilirmak and Başer was conducted at a maternity hospital [26]. Used methods were telling, discussing and demonstration. First session consisted on: Symptoms of labor, hospital environment by videos and the pictures, preparation of the body for labor and emotional changes experienced by the mother in preparation to the delivery, starting time of the second stage of labor.

A computer with a CD driver, woofer system and birth models were used as education materials. Telling, discussing, power point presentations, videos and some techniques directed at skill development were used during the education. Intervention was given in two sessions on the same day, first session lasted for 40 minutes while the second session lasted for 30 minutes. A 10-minute break was given between the two sessions. In the first intervention, education for preparation to delivery was given. In the second interview the W-DEQ-A was administered in a face to face interview.

Second session subjects were: showing the delivery table by the pictures and video, time spent on the delivery table (duration of the stage), breathing and pushing, episiotomy and episiotomy care, sharing feelings and thoughts about the second stage of labor, positive speaking about labor and birth success, sharing experiences of a woman who gave birth successfully and positively.

As results, in the first interview session, no significant difference was found between W-DEQ-A scores of the study and control groups. The mean pre-education W-DEQ-A score was 61.1 while it was 42.0 post-education in the study group. The post-education W-DEQ-A score was 58.5 in the control group while it was 42.0 in the study group.

About feelings during the first stage of the labor 32.0% of the women in the study group felt fear too much, in comparison with 44.9% in the control group, participants confidence perceptions in the postpartum were 80.0% of the study group and 49.0% of the control group, finally women in the study group indicated to feel more confident about themselves, and 66.0% of them expressed that they would advise to give birth vaginally while 51.0% women in the control group would advise it ($p > 0.005$).

Gözde Gökçe İsbir et al.27 carried out an antenatal programe, based on Dick-Read's "natural labor", Lamaze's "psychoprophylaxis", Balaskas's "active birth" and Mongan's "hypnobirthing" philosophy. By using simulators, animation videos, role-playing and slide presentations. Facilitators had previously participated in Childbirth Educator Courses, and Rational, Emotive & Cognitive–Behavioral Theory Courses.

The program consisted of a four week antenatal class series outline, on first week the main subjects were introduction, class expectations, raising awareness of fear of childbirth and strategies to cope with fear of birth. Week number two consisted in psychological and physiological adaptation to birth, third week was based on understanding birth and having a sense of control over birth and finally on the fourth week they develop positive appraisal of birth and preservation of positive birth memories classes.

The interventions groups consisted of 5–8 women, and the course was planned on 16 hours of instruction split into four 240-minute weekly sessions. Each session included presentation of theoretical information for 150 minutes, warm-up and stretching exercises for 45 minutes and relaxation exercises for 45 minutes. The study concluded that childbirth self-efficacy and fear of birth in pregnancy before the intervention, showed no significant differences in childbirth self-efficacy scores, outcome expectancy score, efficacy expectancy score and fear of birth in pregnancy score ($p > .05$) noted between the groups.

Childbirth self-efficacy and fear of birth in pregnancy in the intervention group before education and after education evidenced differences in childbirth self-efficacy scores, outcome expectancy scores, efficacy expectancy scores and fear of birth in significant pregnancy scores ($p < .01$). Finally comparison of fear of birth postpartum, and PTSD symptoms following childbirth between the intervention and control groups in the postpartum period indicated that Women in the intervention group had significantly lower PTSD symptoms following childbirth ($p < .01$) than women in the control group in the postpartum period.

The study of Gilmer identified potentially effective new-parenting education interventions that could be implemented at a population level during the transition to parenthood period [30]. Their main findings based on the implementation chain, proposed that the foundation for parent learning is based on the lack knowledge about parenting.

Citing the first main finding about 'Perception that there is a learning need at a universal level' authors mentioned that programs leaders' perspectives were more likely to guide the progression, goals, objectives, and evaluation of the programs. Three trials evidenced that information that was deemed to be important to parents was introduced without evidence, and fathers specific information or program delivery considerations in prenatal and early parenting classes were sometimes identified, and concluded that this focus was usually missing from the design. Four trials noticed few programs based on stress reduction, psychoeducational principles, or intimate partner relationship building.

Besides program designed around a theoretical approach were frequently associated with research groups, some other theoretical approaches developed in the courses were Attachment Theory, Maternal Role Attainment and Self-Efficacy.

About the 'Design of program delivery' it may include materials as booklet or printed material DVD or film-based, and Internet-based. Evidence concluded that alternate forms of parent education were any more or less effective than traditional face-to-face methods. Evidence showed that programmes delivered in faith-based systems, programmes operating in parental workplaces, culturally-based venues or primary care organizations, seemed to be more attractive to get parents involved. Authors found that programme content was not based on a community-level analysis of participants' needs.

Concerning 'Participant/parent engagement, attrition, and reach' majority of the programs did not identify an engagement strategy, demonstrating that existing services and brochures were using to recruit, additionally authors mentioned that let parents choose topics may engage in educational initiatives. Apropos of the samples, anyone of the trials defined the size of the target, most of them were small sample size percentage of eligible parents in a community, actually attended classes who were included in studies.

To increase participation authors notify that some programs provided food, or locating the program in a location the parents were familiar. There were also financial incentives in the form

of a small stipend. Some trials identifying that male facilitators increased the engagement and ongoing participation of fathers. Majority of authors did not mentioned the degree of participant attrition and consider this issue as a consideration or limitation that programmes be failing to engage parents and meet the goals of universality.

Regarding 'Efficacy of the program' authors mention that the challenge is the trade-off between program fidelity concerns and the need to adapt programming to suit the audience needs. Evaluations of efficacy were based on expectations that programs were delivered as designed; most of the studies found no evaluation of program fidelity provided, even when the authors discussed the training and facilitator development as part of their analysis. Some studies indicated the training requirements for facilitators were evaluating to be extensive and had high turn-over rates, resulted in recurring costs of training that were not sustainable.

About program efficacy data were frequently collected by the facilitator while the participants were attending class, thus social desirability may be a bias. Even so it was evident that parent reports of satisfaction with course content and delivery were usually high. Finally about 'Parents will use the information and change their behavior to be more optimal for child outcomes' existed evidence to support the view that universal, population level education programs are effective at either changing or improving parent behaviors or impact child outcomes was not identified.

The review by Amin, Tam, and Shorey explore the efficacy of universal parent education interventions on the parental self-efficacy of first-time parents [31]. Main results were post-intervention (up to four weeks following the end of the intervention) and short-term follow-up (up to six months after the end of the intervention). All interventions were focused on aspects of parenting. Teaching methods were varied: Postnatal psychoeducational Program Bandura's self-efficacy, Teaching intervention based on the Brazelton Neonatal Behavioral Assessment Scale, Newborn care education program based on the WHO's guidelines, Childbirth educational group sessions, Prenatal and postpartum education for first-time fathers, Having a Baby' antenatal educational program Green and Kreutzer's PRECEDE PROCEED model of health planning method. Learning strategies were teaching, group discussions, demonstrations and return-demonstrations, role-play, and modelling, facilitated discussions and didactic teaching using written materials.

Authors concluded that universal parent educational interventions increase parental self-efficacy at post-intervention and short-term follow-up. Furthermore longer parenting programs (at least ten weeks or more) showed greater improvements in PSE compared to those with shorter durations. This review mention that group formats rather than individual formats improve the psychosocial well-being of parents. Concerning the delivery format it may not have much significance on improving the PSE of new parents. Respecting to first-time mothers the study revealed that new mothers preferred longer sessions with midwives to build confidence and mastery in their parenting skills, finally authors point out the need for more studies that investigate the effect of universal parent education interventions on PSE at follow-up to observe if the benefits are maintained over time.

The review by Entsieh and Hallström identified five themes [29]. (1) Partner involvement, (2) Early and realistic information about parenting skills, (3) Looking for a shoulder to lean on, (4) Managing the relationship of partner and (5) learning strategies, they concluded that emphasis should be placed both during the prenatal and postnatal period in antenatal education classes.

About "partner involvement" four studies showed that one weakness of antenatal education is that majority of the men who attend antenatal sessions felt excluded concerning how they were treated during the antenatal sessions. One trial referred new mothers were disappointing about non-participation and non-attendance of their partners. The studies also referred that men were missing out on relevant information and support, because of the schedule of the classes and they also expressed a need for certain contents specifically tailored towards expectant and new fathers, to make them feel more involve.

Concern "Early and realistic information about parenting skills" the trial concluded that there is a need about parenting skills during antenatal classes, introduced early in the postnatal period and there is also a huge gap between information given before the birth, and reality of how things were in postnatal. A trial also referred that the education received equipped participants with the skills to parenthood breastfeeding and general care of the infant.

Regarding "A shoulder to lean on", the studies determined a need for prolonged continuity of care from the midwives and the health care visitor, to master breastfeeding and other parenting related skills. Regardless of the variety of sources of information the men still felt a lack of emotional support.

Respecting "Managing the couple-relationship" one trial concluded that new parents felt prepared for changes before arrival of the baby, through antenatal education provided by midwives. A second trail concluded participant parents wished they had been informed earlier, about the possible changes.

Finally about "Learning strategies" five studies showed the importance of interaction and learn from their peers and meet new parents. Another study concluded that even if there is a high preference for the group antenatal sessions, some parents expressed a need for individual care when they felt uncomfortable to share some needs, at last, one trial mentioned group sessions to have moderate numbers of attenders, to suit the attendance of all to innovative in different ways of teaching.

Brixval focused the systematic review on antenatal educational programs offered by an educator to groups consisting of less than 20 individuals and control groups with standard care, individual care only or other types of educational programs [35]. The amount of education in the experimental condition varied from a single 1-h session to 24- h sessions each. The review revealed that there was no sufficient evidence to conclude that antenatal education in small classes is effective regarding obstetric and psycho-social outcomes and suggest well conducted randomized controlled trials with a low risk of bias.

The authors scored all trials as overall 'high risk of bias's for the self-reported outcomes. For the objective outcomes, two trials were scored 'overall moderate risk of bias, but were scored 'overall high risk of bias's for the self-reported outcomes since participants were not blinded. Programs developed with co-interventions were allowed if the intervention was delivered equally in both the experimental and control group and case of comparisons between two programs, the most intensive was considered the experimental intervention.

Some of the intervention focused women with an specific condition as postnatal depression or with low socio-economic status, some others programs developed a psycho-somatic approach versus standard antenatal education program. All of them reported no significant effect on depression neither in pregnancy nor six weeks postnatally, results were measured with several different measurement tools, self-efficacy, or locus of control. On the contrary, programs addressed to both parents, compared to a brochure on child care; to assessed the effect of a psycho-social prevention showed that parents but not mothers in the experimental group, experienced significantly higher co-parental support (MD 0.29, 0.05 to0.53), parenting-based closeness (MD 0.35, 0.04 to 0.66), and significantly lower father-child dysfunctional interaction (MD−0.26, −0.43 to −0.09) compared to fathers in the control condition.

The authors refer that intervention based on psycho-educational classes versus letter on fear of childbirth demonstrated intervention significantly increased the likelihood of spontaneous vaginal delivery but had no effect on the use of epidural analgesia, overall caesarean section, elective and emergency caesarean section, vacuum extraction, and induction of labor. Programs using self-hypnosis classes versus standard care, reported no effect on the outcomes: use of epidural analgesia, spontaneous delivery, induction of labor, and any breast feeding four months postnatal.

General antenatal education classes versus standard care, reported a protective effect on the use of epidural analgesia (RR 0.84, 0.73 to 0.98) but no significant effect on any other kind of pain relief or obstetric interventions, the study also reported no significant effects on breast feeding at five weeks or six months postnatally and breast feeding self-efficacy or postnatal depression six weeks after birth, but reported a higher proportion with sufficient knowledge about breast feeding six weeks postnatally among women attending the general antenatal training program in small classes (RR 1.08, 1.01 to 1.15). Paternal education classes conducted a breast feeding intervention targeted at expecting fathers, reported a significant intervention effect on any breast feeding six weeks postnatally (RR 1.09, 1.00 to 1.18) and a significantly positive effect on paternal knowledge acquisition about pregnancy, delivery, infant care, and support towards the mother (MD 9.55, 1.25 to 17.85).

Tree trials that examined extra breast feeding sessions in small classes versus standard care reported a positive effect on exclusive breast feeding six weeks postnatally (RR 3.20, 1.88 to 5.46), significantly higher breast feeding self-efficacy among participants in the experimental condition four weeks postnatally (MD 4.60, 0.72 to 8.48), and no significant effect in initiation of breast feeding or breast feeding six months postnatally, respectively.

Finally one study assessed the effect of a breast feeding class with group discussion compared to 15- to 30-min one to- one contact with a medical doctor on breast feeding topics and reported no effect on initiation of breast feeding or any breast feeding 12 weeks postnatally, and one trial assessed the effect of a breast feeding education program compared to breast feeding and childbirth pamphlet reported a significantly higher rate of breast feeding initiation (RR 1.86, 1.35 to 2.55) among participant in the experimental condition but found no effect on breast feeding six months postnatally.

Primary Outcomes

Respect to the primary outcomes in the current review (table 8) it was analyzed the effectiveness of prenatal education programs, and the types of programs that were taught.

Kizilirmark and Baser, Gözde Gökçe İsbir, carried out studies where they developed prenatal programs; the other studies were systematic reviews looking at the effectiveness of diverse groups of studies [26,27]. Therefore, to respond to the main result in the first place, the researchers focus on the study of Kizilirmark where they developed topics related to the characteristics of the work and the delivery room and the practices that are carried out there, from the application from the W-DEQ-A questionnaire, and found no significant differences between pre-education and post-education between the intervention group and the control group [26].

For their part, Gözde Gökçe İsbir did not find any differences regarding the self-efficacy and fear of birth score before the intervention between the groups; however, after the intervention the score was significant; women in the intervention group had significantly lower post-traumatic stress symptoms after delivery than women in the control group in the postpartum period [26].

Regarding the type of programs developed, Kizilimark used a computer with a CD driver and woofer system and birth models to develop the subject matter discussed above, also used discussion, PowerPoint presentations, videos, and some techniques for developing exercises during education [26]. Two sessions were given in one day, the first lasting 40 minutes and the second lasting 30 minutes, offering a 10-minute break between sessions.

For their part, Gözde Gökçe İsbir developed classes based on the natural labor of Dick Reads, Psychoprophylaxis of Lamaze, the active childbirth of Balaskas and the philosophy of the hypnopartum of Mongan [27]. They implemented materials such as simulators, mannequins, videos, slide shows and games. The courses are developed in four weekly sessions of 240 minutes for 16 hours of instruction. Each session included presentation of theoretical information for 150 minutes, warm-up and stretching exercises for 45 minutes and relaxation exercises for 45 minutes. Finally, Brixval, the amount of education in the experimental condition varied from a single 1-h session to 24 sessions each [35]. Focused on depression-preventive program, psycho-social prevention group-based, antenatal training breast feeding sessions.

Secondary Outcomes

1. Perceptions of parents

There was evidence that effective facilitators helped increase parents' perceived satisfaction with programs [35].

2. Type of information to the parents

Gilmer's study notes that the principles of adult learning were overlooked and that theories of parent-child interaction were not apparent; nor were direct links established between universal new parent education programs and child development outcomes [30]. The program's evaluation criteria were inconsistent, with excessive reliance on parental satisfaction or self-reported intention to change behavior. On the other hand, Amin explicit that universal parent education interventions significantly enhanced parental self-efficacy among first-time parents and these effects were also maintained over time [31]. The duration of the interventions affects the improvement of the parents' self-efficacy.

3. Physical and emotional maternal wellbeing

In the systematic review of Entsieh and Hallström it is mentioned that prenatal education reflects a need for first-time fathers and is an opportunity for men to participate before and after childbirth

[29]. Information becomes necessary and parents seek support and help from the health professional, especially during the early postpartum period. Another aspect that is observed is the need to learn from each other from their experiences as well as from guest speakers in the programs. Participants wished to have been well informed ahead of time, about the possible changes in their conjugal relationship and the related coping strategies. All these elements favor the emotional well-being of the mother and the couple as such.

Table 8: Outcomes, effect size and notes of the included studies

Study	Primary outcome	Secondary outcomes	Effect size	Notes
Kızılırmak and Baser. 2016 [26]	Effectiveness of the prenatal education program and type of program.	Type of information to the parents Physical and emotional maternal wellbeing Perceptions of parents	It was determined that 82.0% of the study group and 75.5% of the control group had received some information from their relatives or friends and TV or Internet about labor and 50.0% of the study group and 44.9% of controls felt fear due to the information they received. While the mean pre-education W-DEQ-A score of the study group was 61.1, it was 42.0 after education ($p < 0.001$). It means that their fear level was low after the education. It was found that the mean post-education score of the study group was 42.0 while it was 58.5 in the control group with a statistically significant difference ($p < 0.001$), It was found that the mean W-DEQ-A score in the study group de- creased 15 points compared to pre-education however it increased 2 points in the control group ($p < 0.001$) Some feelings that pregnant women felt after the education during the first stage of the labor were investigated. While 32.0% of the study group told they felt fear too much, this ratio was 44.9% in the control group ($\chi2 = 6.908$; $p <0.05$). It was found that 60.0% of the study group and 42.3% of the control group felt confidence during the first stage of labor ($p >0.05$) and 46.0% of the study group and 26.5% of the control group never felt fear in the second stage of labor ($\chi2 = 6.908$, $p <0.05$). Some feelings that the pregnant women experienced during the second stage of labor were also investigated; 44.0% of the study group and 20.4% of the control group reported that they never worried ($p <0.05$) and 42.0% of the study and 20.4% of the controls said that they were never anxious ($p <0.005$). Also, 74.0% of the study and 40.8% of the control group reported feelings of confidence ($p < 0.005$). Perceptions related to labor in the postpartum stage are shown; 80.0% of the study group and 49.0% of the control group reported that they felt themselves well—especially as physical wellness—after the birth ($p < 0.005$) and 64.0% of the study group and 40.8% of the controls reported that they were satisfied from the birth process ($p < 0.05$). It was also determined that 54.0% in the study group and 32.7% in the control group stated that they would choose have a vaginal birth for their next child ($p < 0.005$), The study group that took education about preparation for birth feel more confident about themselves than the control group. In the study group, 66.0% of women expressed that they would advise to give birth vaginally while 51.0% women in the control group would advise it ($p > 0.005$). Also, it was determined that 90.0% women in the study group evaluated the preparation to birth education as good, when their opinions were asked.	By providing prenatal education, it is hoped that, the women would have a better experience, especially in terms of fear of childbirth and physical wellness. As a result of the study, the education for preparation for birth provided positive perceptions regarding labor and decreased fear of childbirth in primigravida women. It is suggested that these educations should be given to pregnant women regularly and continuously.

Gökçe İsbir Gİ. et al. 2016 [27]	Effectiveness of the prenatal education program and type of program.		There were no differences in the sociodemographic characteristics of participants in the active treatment and control groups. Participants in the intervention group were on average 26.8 years old (SD = 2.6) and the majority were university graduates (70.5%). Similarly, participants in the control group were on average 25.3 years old (SD = 4.6) and the majority were university graduates (52.2%) (p N .05, χ^2 = 4.46). There were no significant differences in childbirth self-efficacy scores, outcome expectancy score, efficacy expectancy score and fear of birth in pregnancy score were noted between the groups (p < .05). The differences in childbirth self-efficacy scores, outcome expectancy scores, efficacy expectancy scores and fear of birth in pregnancy scores were significant (p < .01). The difference in fear of birth in the postpartum period between the groups was significant (p < .05). Women in the intervention group had significantly lower PTSD symptoms following childbirth than women in the control group in the post- partum period (p < .01).	Each woman provided the reason for her fear of childbirth and was then supported in overcoming it in role play scenarios. In addition, it was recognized the dynamics and sources of fear of childbirth and told effects of childbirth fear on birth. The result showed that antenatal education in this study was effective on fear of childbirth.
Gilmer et. al. 2016 [30]		Type of information to the parents Perceptions of parents	The papers we reviewed offered little evidence of having assessed parents' level of knowledge or identified their concerns before beginning the program. There were also a few program designed around stress reduction, psychoeducational principles, or intimate partner relationship building . The program designed around a theoretical approach were frequently associated with research groups who developed a program based on their hypothesis and then had this program delivered by practitioners. Other studies reviewed program that were based on well-known developmental theories such as Attachment Theory, Maternal Role Attainment. Many program appeared to be atheoretical or else chose not to discuss their theoretical underpinnings.	The implementation chain identified that the foundation for parent learning in this field is based on the assumption that parents lack knowledge about parenting. This lack of knowledge leads to uncertainty about how to address the infant's needs and, potentially, distress for the parent and child. By providing information about parenting and infant care, this cycle of uncertainty and distress will be reduced by increasing parenting knowledge and skill. Based on this assumption, it was expected that program designers would have explored the extent of parent knowledge and knowledge gaps before designing the program.

Amin, Tam, Shorey 2018 [31]		Type of information to the parents	The results revealed that longer interventions showed a more significant change in measures of PSE (SMD 0.71, 95% CI 0.54 to 0.89; $z = 7.93$, $p < 0.001$) than briefer interventions (SMD 0.41, 95% CI 0.23 to 0.60; $z = 4.36$, $p < 0.001$). No heterogeneity was found in both subgroups of interventions with brief ($p = 0.71$, $I^2 = 0\%$) and long durations ($p = 0.45$, $I^2 = 0\%$). The subgroup differences were statistically significant ($p = 0.02$, $I^2 = 80.7\%$). This suggests that the longer the duration of the intervention, the greater the improvement in PSE. Results revealed that parent education interventions significantly improved PSE (SMD 0.61, 95% CI 0.27 to 0.95; $z = 5.73$, $p < 0.001$), but with evidence of significant heterogeneity using a random-effects model ($I^2 = 65\%$, $p = 0.06$) The results indicated that universal parent educational interventions produced significant improvements in PSE at post-intervention and at short-term follow-up. The results of the subgroup analyses at post-intervention revealed that parenting programs significantly enhances PSE regardless of the durations (two weeks to 15 weeks) and delivery methods compared to the control group. However, longer parenting programs (at least ten weeks or more) showed greater improvements in PSE compared to those with shorter durations.	The findings derived from this review provide adequate evidence to support the use of universal parent education interventions to complement the current prenatal and postnatal care provided. Given the challenges that first-time parents face, it is imperative that they are well-supported in order to facilitate a smooth transition into parenthood. Providing universal parent education interventions that focus on enhancing PSE may be protective against the detrimental effects of fatigue and psychological distress that parents may experience. Implementing universal parent education interventions during the prenatal and postnatal periods may also reach out to first-time parents who are particularly at risk of poor adjustment into parenthood, thus allowing early intervention with more focused treatments. Evidence highlighting the importance of paternal PSE on the well-being of children and numerous policy directives towards better support for fathers suggests that universal parent education interventions should be offered to first-time fathers as well. The results of this review revealed that intervention duration rather than the delivery method is a potentially important factor that influences the intervention's efficacy in enhancing PSE. Although not examined in this review, parity may also impact the results. First-time parents, due to lack of exposure, maybe more receptive to any type of intervention efforts and support. It is vital to recognize that these interventions may be more beneficial for primiparas, rather than multiparas who are likely to have higher PSE because of their levels of experience. Therefore, studies that explicitly investigate delivery methods and compare the impact of these interventions on both first-time and experienced parents are needed to explore components that might be beneficial for specific groups of parents. Future studies could also focus on the following: (1) considering the impact of individual-based interventions on PSE, (2) comparing group-based and individual-based interventions on their effectiveness and cost-effectiveness, (3) integrating follow-up measures in the short-term and long-term to investigate the efficacy of universal interventions over time and the need for supplementary sessions to ensure the maintenance of the effects on PSE, and (4) considering the cost-efficacy of universal parent education interventions. Given that costs associated with childhood behavioral and conduct problems are considerable.

Entsieh, Hallström 2016 [29]		Physical and emotional maternal wellbeing Type of information	The meta-ethnographic approach of Nobilt and Hare involves seven steps namely: (1). Getting started, (2). Deciding what is re- levant to the initial interest, (3). Reading the studies, (4). determining how the studies are related, (5). Translating the studies into one another, (6). Synthesizing the translations, (7). Expressing the synthesis. The principal findings are: Majority of the men who had the chance to attend antenatal sessions expressed the concern that they felt excluded with from how they were treated during the antenatal sessions. It was clear that the women and the practical matters concerning childbirth were the main subjects of discussion during the couple's antenatal visit; an aspect that majority of the men found to be very disappointing. The male participants expressed a need for certain sessions and contents of discussion to be specifically tailored towards expectant and new fathers, to cause them to feel more involved and in control of the situation. The expectant and new parents wanted information that was "current," "correct, "reliable" and provided by a "trustworthy" and "approachable person". They also shared the common view that there was a huge gap between information given before the birth, and reality of how things were postnatal. A need for the opportunity to stay longer at the midwife-led centers to master the art of breastfeeding and other parenting-related skills was shown by the new mothers. While some new parents felt the midwives had prepared them for this change, others wished they had been informed earlier, before the arrival of the baby, about the possible changes and resulting stresses on their relationship as a couple. The participants who had attended group antenatal sessions felt that it was valuable to have had the opportunity to interact and learn from their peers. It was important for the expectant parents to have had the opportunity to meet other new parents, both before and after birth, to learn from their experiences about early parenthood	Antenatal education classes should not only focus on, and end with childbirth education. Rather, equal emphasis should be placed both during the prenatal and postnatal periods. Given that the postnatal needs of first-time parents are overshadowed by their prenatal needs, interventions, therefore aiming at enhancing positive transitions to parenthood could be introduced early during the postnatal period. Further, still, parenthood education classes could adopt adult learning strategies that are participatory, and experiential in nature, if its intended purposes are to be achieved. A shift from the provider-patient vertical kind of information dissemination to a more participatory kind of care during antenatal classes could be considered. Parenthood education classes could also be flexible enough to allow the content to meet the needs of both heterosexual and same-sex first-time expectant and new parents.
Brixval et al. 2015 [35]	Effectiveness of the prenatal education program and type of program.		It is not possible to draw definitive conclusions on the effect of small group antenatal education on obstetric and psycho-social outcomes based on this systematic review, because they found great inconsistency of results across studies, and there was no clear pattern of effect.	Insufficient evidence exists as to whether antenatal education in small classes has any effect on obstetric or psycho-social outcomes. Given that the evidence base is inconclusive.

Qualitative Analysis

Category	Subcategory	Evidence Synthesis
Informal Pre-education and education guide for delivery preparation.	Education about preparation for birth	In general, prenatal education is considered effective since studies have shown that the fear of childbirth decreased, especially in primiparous women.
	Partner involvement and participant in education programs	Most of the men who attended prenatal classes expressed concern regarding how they would be welcomed during the educational process. On the other hand, the emphasis of the course approach was on topics related to women, an aspect that men found disappointing; for example, one study mentions that obstetricians reported that sessions such as breastfeeding were irrelevant to men. So, the woman agrees that the non-participation and non-attendance of couples is a weakness in prenatal education. Men express the need for sessions and content to be adapted to future and new fathers so that they feel more involved and have active participation in the entire process of transition to fatherhood.
	Information received	The development of prenatal education courses is based on the assumption that parents and future parents lack knowledge about the stages of childbirth, postpartum, and the transition to parenthood. By providing information about it, uncertainty and anxiety will be reduced by increasing parents' knowledge and skills. However, the studies mention that there is not enough evidence to support the fact that parental education can have a positive impact on their attitudes and behaviors for optimal development of the child to occur; nor was any evidence identified to support the position that universal educational programs are effective in changing or improving parental behaviors that affect the adequate development of children due to methodological conditions of the studies.
Used methods	Program delivery	Parent education is a complement to prenatal and postnatal care to facilitate the smooth transition to parenthood. In general, the courses are designed to develop a series of classes with different themes. Various printed materials are also included, as well as learning techniques, discussions, PowerPoint presentations, videos, etc. Furthermore, studies also discuss alternative forms of learning not supported by scientific evidence as effective. If the information is not focused on the interests and needs of the parents, they indicate that there is little probability that the parents are independently involved in the educational methodology.
Feeling of pregnant women after education	Feelings of pregnant women after education	Primiparous women benefit most from the educational intervention for childbirth; especially, because it protects against the effects of fatigue and anxiety, and it mitigates the fear of childbirth and increases physical well-being. This situation is more evident in primiparous than in multiparous women, probably due to the experience that the latter has.
	Perceptions in the postpartum	The authors of the articles analyzed mention that there is a predilection on the part of first-time parents to meet prenatal needs over postnatal needs. Hence the importance of introducing promptly interventions that improve positive transitions to parenthood during the postnatal period, so that positive experiences are improved. The period of pregnancy to the early postnatal period is a time when many changes occur that the couple has to deal with and resolve in the best way. So research recommends that prenatal education classes should not only focus on and end with the birth of a child, especially during the early postnatal period.
	Managing the couple relationship	Results of the research about couples show the need to be educated beforehand regarding the changes that will occur before and after the arrival of the child. The different types of relationships of couples, such as homosexual couples, must also be considered since they are not prepared for such a parenting transition either. The prenatal education system is mostly focused on care based on heterosexual couples, which makes it difficult to approach with another type of during the transition to parenthood. Midwives have been encouraged to train and gain more knowledge in parenting with same-sex couples to be in a better position to communicate with same-sex pregnant couples and address their postnatal needs.

Childbirth self-efficacy	Self-efficacy, and predictive post-traumatic stress disorder	Differences in labor self-efficacy scores, outcome expectation scores, efficacy expectation scores, and fear of birth in pregnancy scores were significant. A mother's self-efficacy is affected by her perception of birth. Therefore, during prenatal education sessions, participants share emotions and thoughts about birth and face difficult situations during childbirth. The group that receives prenatal education shows greater self-efficacy than those that do not receive that education. Evidence supports the idea that prenatal education can reduce the occurrence of traumatic stress symptoms after childbirth. Fear of childbirth during pregnancy is a predictive factor for developing post-traumatic stress symptoms in response to subsequent childbirth. Low labor-related self-efficacy is associated with post-traumatic stress symptoms. In nulliparous women, the expectation of results and the expectation of efficacy correlate positively with each other and both variables are negatively correlated with fear of childbirth. Prenatal education appears to provide a basis for a positive delivery experience and a postnatal period, by reducing the fear of delivery and increasing the self-efficacy of delivery, factors that probably explain the lower levels of post-traumatic stress symptoms after delivery.
	Efficacy of the program	The duration of the intervention rather than the delivery method is a potentially important factor influencing the effectiveness of the intervention. Furthermore, the results of the subgroup analysis suggest that interventions longer than 10 weeks demonstrated a significantly greater magnitude of effect than shorter interventions. Many of the program effectiveness reports high parental ratings of the course; however the evidence indicates that the surveys are administered at the end of the course, only the participants who go to the last class express their opinion, so that selection bias is visualized; on the other hand, satisfaction surveys of the program are applied, and not themes about knowledge or behavioral changes. This does not truly reflect the effectiveness of the program and there is also no follow-up to assess the impact of the program on child development.

Narrative Synthesis

This review focused on two main outcomes that were the effectiveness of prenatal education programs, and the types of programs that were taught. The following topics were identified in secondary outcomes: 1. Perceptions of parents; 2. Type of information to the parents; and 3. Physical and emotional maternal wellbeing. The reviewers refer to each of these outcomes below.

Concerning the effectiveness of prenatal education, some studies consider that they are effective showing that it reduces the fear caused by birth, especially in primiparous women [26,27]. Fear of birth can be experienced before, during, and after birth [3,36]. Therefore, it can lead to loss of confidence in the health personnel who take care for the mother and loss of control at the time of delivery. Other aspects that are also associated with fear of birth are parity, type of previous delivery, depression, low social support, and level of knowledge [36].

Taking into account the importance of fear of birth, various models and approaches have been put into practice to teach pre-delivery classes such as breathing techniques, hydrotherapy, hypnosis, accompaniment by a doula, holistic midwifery care, cognitive therapies. and behavioral and psychoeducation [36].

It is evident that prenatal education universally has an important place during the preparation of couples towards birth and later towards parenting, and there are diverse courses and preparation methods, these are not standard among countries and vary in quality and content.

The topics developed in the different courses increase prenatal knowledge about prenatal care practices and stimulate the achievement of goals regarding breastfeeding [37]. It should not be forgotten that the preparation classes are an ideal time to educate parents, the relationship of couples, and their future life where the inclusion of the father is likely to have greater positive effects.

Some studies in the literature have reported that prenatal education is an important component in the preparation of couples, but it is not enough to meet the needs in the sessions [25]. A recent longitudinal study showed that there is a significant decline related to satisfaction (up to a full standard deviation or more in 20-59% of couples) [37]. Women frequently identified that they desire more focused education in the postnatal period and their preparation for parenthood [25].

In interviews with parents after birth, it was reported that parenthood classes had not been included in the information and that they focused properly on birth [38]. This is supported by a study carried out by Bryan, which showed that including in classes "the first three months after birth", the educational program is more effective in increasing parent/child interaction compared to standard prenatal education classes [38]. Therefore, it is important to review the prenatal education courses that are being taught to add postnatal topics and not only focus on the prenatal topic but rather that there is a balance between preparation for birth and parenting [5,29,38].

Postnatal support, both in hospitals and at home, aims to detect problems for both the mother and her baby and to provide the necessary tools for the parents' transition [39]. However, the study by Buultjens reported that the women's comments illustrate dissatisfaction with the lack of information from the staff and, on the other hand, inconsistent information received [25]. This is an important finding that supports the position and research of other authors regarding the lack in thematic depth of postnatal care received in maternal care. These same authors point out that despite the worldwide differences in maternity services, women's expectations and perceptions are very similar: lack of information time, contradictory information. This leads to a reflection regarding postnatal care, highlighting the need for informational support, despite the overloaded work that the staff has in order to provide qualified care [25].

A health promotion approach is required for maternity care education to extend beyond physical recovery from birth to consider psychosocial factors; including perinatal morbidities that can disrupt the smooth transition to parenthood, while also addressing the importance of social media in the early transition to parenthood to minimize social isolation and increase immediate access to subsequent service provision if they begin to adjustment or related problems arise [25].

However, more robust studies have required that show that prenatal education programs are highly effective and cause attitudinal changes that impact children's development, studies that have not been identified in the literature so far [30]. Gilmer mention that few studies make a measurement beyond the intention in the use of information, satisfaction with the programs, or evaluation of how they are used and that only in their observations did they find three studies reporting changes in parental behavior [30].

The effectiveness of a prenatal education program is influenced by the length of the program rather than its method. The observed studies suggest that longer duration, for example, programs of more than 10 weeks, have a more significant effect than one of shorter duration. Prenatal education classes should contemplate not only aspects of pregnancy and childbirth care but also issues related to the postnatal period, given that the postnatal needs of first-time parents are overshadowed by their prenatal needs, therefore, interventions intended Improving positive transitions to parenthood could be introduced early during the postnatal period [29]. Besides, parent education classes must adopt participatory and experimental adult learning strategies if their purposes are to be achieved [29].

Regarding the type of programs that are given to parents and the incentives that are given, they are very varied and some authors discuss the importance of such incentives [30]. In this aspect, even the form of recruitment of parents for participation in the programs has to be considered. Also literature reports considerable limitations in relation to the relevance of the courses for the participants and the time spent on developing some topics where it is very common for the program facilitator to cover an exhaustive list of topics delivered over several weeks that may or may not be related to the issues that parents are really interested in or experience.

Svensson propose that to attract parents' attention in programs, one strategy may be let them choose the topics that are most important to their situation [40].

The postnatal component of the care model could support early discharge, also group follow-up sessions could be scheduled at discharge and organize sessions that are designed to reinforce practical aspects of baby care and improve mother-baby attachment with formal and informal sources of support for providing a model of care through group practice can also be more economical. However, the provision of education could be provided in a timely and relevant way for each stage throughout the transition process [25].

According to the review carried out by Entsieh and Hallström, it is important that there is a balance between group and individual prenatal sessions [29]. The former because the opportunity to share and learn from the experiences of others was considered valuable as it is a source of support and tranquility; however, individual attention is also considered necessary to resolve specific doubts and concerns of the parents and that in a group they feel uncomfortable to share.

In general, the designs of the programs are presented in a varied way in terms of the subject matter that is addressed and the emphasis that is given. Learning strategies are generally based on sessions of varying lengths, using a variety of printed materials, and discussions, PowerPoint presentations, videos, among others, are developed as learning techniques. On the other hand, other programs use alternative techniques for learning that are not supported by scientific evidence as effective. There are program designs where their nature is formal and the participants are in a type of conference with different guest speakers who will present their respective areas of expertise; another less formal methodological design, where an educator gives them information and teaches them practical skills that the whole group can discuss; and a third design where participants have greater control of the learning process, supporting each other [29].

The most relevant aspect to be rescued is that regardless of the design of the program if it is not based on the interests and needs of the parents, and in their active participation, there is very little probability that the parents get fully involved in the methodology.

About the perceptions of parents this current review observed that the learning for parents is based on the assumption that parents lack knowledge regarding parenting; this leads to uncertainty regarding the needs of children and, of course, increased stress on parents.

When receiving information related to issues of parental interest and care, uncertainty and stress appear to be reduced according to the studies carried out by Gilmer [30].

Researchers have discussed the often limited scope of antenatal education and reported that significant differences often exist between women's informational needs and interests, and the educators' perceptions of women's learning needs [38]. Therefore, it is highly recommended that the design of prenatal courses consider issues related to the partnership and those topics that are of interest to parents after exploring their concerns and wishes for knowledge on specific topics. However, most of the prenatal courses do not cover these topics or solve the specific information needs according to the interests of the participants in the courses.

Duncan and Baedacke point out that there are also few programs that are designed with the aim of reducing stress, providing psychoeducational principles, or building relationships [41]. Generally, prenatal educational program designs have an emphasis on birth and this is just one of many factors that can be addressed in education especially for first-time parents [25]. This thematic restriction has caused demotivation and dissatisfaction in parents when evaluating courses [30]. In general, they are perceived as beneficial but many women report that they felt unprepared beyond labor and delivery [25].

Another aspect manifested by prenatal program participants is the opportunity for participation given to men in the development of sessions, in which they feel excluded, as also suggested by some women in whom the non-participation of the father is seen as a weakness in the classes, this because men have a lot to contribute and his participation in all the processes is very important, even on breastfeeding issues; however, Entsieh and Hallström, in their study report that "the men found it discouraging that some midwives told them that breastfeeding sessions were irrelevant to

them as men and that they did not need to attend these sessions… They want to be included regarding their new role as parents, and in general in child care" [29].

The type of information that parents receive in antenatal classes sometimes influences the behavior of women who base their decisions about birth on poor or erroneous information [28]. It is important to consider that future parents and new parents want information that is "current", "correct," reliable "and provided by a" trustworthy person "and" accessible person" [29,38]. According to Entsieh and Hallström, they found in the reviewed studies that parents opined that there is a gap between the information they receive before birth and the reality of how things happen during the postnatal period [29]. At the same time, women reviewed that the advice given about the postnatal period was easily forgotten since that their needs during the prenatal period overshadowed their postnatal needs. The birth of a baby brings happiness and joy, but most new parents were often overwhelmed and even shocked when the reality became that they did not know how to care for the baby, which caused low self-esteem and, in severe cases of depression.

A shift from the vertical type of information dissemination between provider and patient to a more participatory type of care during classes should be considered. Parent education classes can be flexible enough to allow the theme developed in the different sessions to meet the needs of both heterosexual and same-sex parents and new parents [29].

Respect to the physical and emotional maternal wellbeing, this current review makes it clear that there are benefits for women when implementing prenatal education since it increases self-confidence, self-efficacy, decreases fear and stress of labor and delivery, evidenced by significant scores [27,42]. It should be considered that the self-efficacy of the woman is an aspect that is affected by the perception that she has regarding the birth, because of the prenatal educational sessions have a protective effect against fatigue and anxiety, reducing the symptoms of subsequent post-traumatic stress at birth, a positive experience in the postnatal period, and generally promotes physical well-being [43]. This is more evident in primiparous women than in multiparous, probably due to the experience that the latter have of the different processes and periods that the woman and her family go through. It should be noted that in nulliparous women, the expectation of results and the efficacy correlate positively with each other and both variables are negatively correlated with fear of childbirth.

However, all the benefits and positive results of the prenatal educational program will be conditioned, as explained above, to the type of program design that is established, taking into account the interests and information needs of the couple, due to the antenatal classes must be focused on parenting issues; besides, the parents interacted more with each other. The literature reported the importance of interactions among parents in antenatal classes [44,45]. This, in turn, expand the parents' social network46. Other important aspects are the established time for the development of the program and the active participation of the couple.

Conclusion

This systematic review highlights the effectiveness of prenatal education programs . It also points out the importance of making more efforts to carry out more robust research on this subject and such a way that establish a universal prenatal program with theory scientific basis and methodological strategies that demonstrate a positive impact for the pregnant women, the childbirth and postnatal, her partner participation and family, and provide to the couple with enough tools for resolve situations that can generate stress and conflict, all the above for the wellbeing of the baby and her family.

Recommendation for practice

The evidence recommends implementation of long courses of 10 or more sessions, taking into account not only issues related to labor and delivery, but also an emphasis on the postnatal period, and the changes and situations that may arise in the family. The program designs must take into account the needs and interests of couples participating in the courses; as well as the active participation of the father in all the issues that are developed for a better involucrate of the couple. Also, to establish varied methodological strategies that have a very active participation and sharing experiences between the couples.

Recommendation for research

Further research with robust samples is needed within this setting to determine with greater scientific support that the implementation of prenatal education programs are effective, and it has an impact for reducing the stress and anxiety to the couples and they can apply the tools provided to them through all the information they receive, to solve situations that can arise with greater tranquility and security, always aimed at establishing a balance in the new situation of change that causes the birth and incorporation of a new member into the family.

Conflict of Interest

The authors have no conflict of financial interest

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Appendix I: search strategy

Science Direct on June 29, 2018.

Search	Query	Records retrieved
# 1	Search Prenatal education, and midwives, https://www.sciencedirect.com/search/advanced?qs=midwive%20and%20prenatal%20education&years=2018%2C2017%2C2016%2C2015%2C2014&lastSelectedFacet=years	922

Science Direct on July 6, 2018.

Search	Query	Records retrieved
# 2	Parent education, and midwive www.sciencedirect.com/search/advanced?qs=parent%20education%20and%20midwive&years=2018%2C2017%2C2016%2C2015%2C2014&lastSelectedFacet=years	1201

Science Direct on July 19, 2018.

Search	Query	Records retrieved
# 3	Antenatal education www.midwiferyjournal.com/action/doSearch?journalCode=ymidw&searchText1=prenatal+education&occurrences1=all&op1=and&searchText2=&occurrences2=all&catSelect=part&prodVal=HA&date=custom&fMonth=1&fYear=2014&lMonth=1&lYear=2018&searchAttempt=-6505452&searchType=advanced&doSearch=Search	4554

Midwifery on July 19, 2018.

Search	Query	Records retrieved
#4	Prenatal education www.midwiferyjournal.com/action/doSearch?journalCode=ymidw&searchText1=prenatal+education&occurrences1=all&op1=and&searchText2=&occurrences2=all&catSelect=part&prodVal=HA&date=custom&fMonth=1&fYear=2014&lMonth=1&lYear=2018&searchAttempt=-6505452&searchType=advanced&doSearch=Search	109
# 5	Antenatal education www.midwiferyjournal.com/action/doSearch?journalCode=ymidw&searchText1=antenatal+education&occurrences1=all&op1=and&searchText2=&occurrences2=all&catSelect=part&prodVal=HA&date=custom&fMonth=1&fYear=2014&lMonth=12&lYear=2018&searchAttempt=1266026082&searchType=advanced&doSearch=Search	530

Science Direct on August 3, 2018

Search	Query	Records retrieved
#6	Midwifery and Prenatal education www.sciencedirect.com/search/advanced?qs=midwifery%20and%20prenatal%20education&show=25&sortBy=relevance&years=2018%2C2017%2C2016%2C2015%2C2014&lastSelectedFacet=years	558
# 7	Antenatal education and midwive www.sciencedirect.com/search/advanced?qs=antenatal%20education%20and%20midwive&years=2018%2C2017%2C2016%2C2015%2C2014&lastSelectedFacet=years	1348
# 8	Midwive and teaching program www.sciencedirect.com/search/advanced?qs=teaching%20program%20and%20midwive&show=25&sortBy=relevance&years=2018%2C2017%2C2016%2C2015%2C2014&lastSelectedFacet=years	1113

Midwifery on August 3, 2018

Search	Query	Records retrieved
# 9	Antenatal education and midwive www.midwiferyjournal.com/action/doSearch?journalCode=ymidw&searchText1=antenatal+education&occurrences1=all&op1=and&searchText2=midwive&occurrences2=all&catSelect=part&prodVal=HA&date=custom&fMonth=1&fYear=2014&lMonth=12&lYear=2018&searchAttempt=-2257 6250&searchType=advanced&doSearch=Search	405

Midwifery on September 7, 2018

Search	Query	Records retrieved
# 10	Midwifery, and - or labour, and - or birth www.midwiferyjournal.com/action/doSearch?journalCode=ymidw&searchText1=midwive&occurrences1=all&op1=and&searchText2=labour+birth&occurrences2=all&catSelect=part&prodVal=HA&date=custom&fMonth=1&fYear=2014&lMonth=12&lYear=2018&searchAttempt=874826751&searchType=advanced&doSearch=Search	529

Science Direct on September 10, 2018

Search	Query	Records retrieved
# 11	Midwife and labour education www.sciencedirect.com/search/advanced?qs=midwife%20and%20labour%20education&years=2018%2C2017%2C2016%2C2015%2C2014%2C2013&lastSelectedFacet=years	1696
# 12	Parent education and prenatal care and midwive	452

Wiley Online Library on September 10, 2018

Search	Query	Records retrieved
# 13	Prenatal education and midwifery www.sciencedirect.com/search/advanced?qs=midwife%20and%20labour%20education&years=2018%2C2017%2C2016%2C2015%2C2014&lastSelectedFacet=years	1436

Science Direct on September 10, 2018

Search	Query	Records retrieved
# 14	Antenatal education and labour www.sciencedirect.com/search/advanced?qs=antenatal%20education%20and%20labour&years=2017%2C2018%2C2016%2C2015%2C2014&lastSelectedFacet=years	1991

Midwifery on October 21, 2018

Search	Query	Records retrieved
# 15	Antenatal classes and chilbirth and midwive www.midwiferyjournal.com/action/doSearch?journalCode=ymidw&searchText1=antenatal+classes%2C+childbirth+and+midwive&occurrences1=all&op1=and&searchText2=&occurrences2=all&catSelect=part&prodVal=HA&date=custom&fMonth=1&fYear=2014&lMonth=12&lYear=2018&searchAttempt=-695 208749&searchType=advanced&doSearch=Search	137
# 16	Prenatal preparation www.midwiferyjournal.com/action/doSearch?journalCode=ymidw&searchText1=prenatal+preparation&occurrences1=all&op1=and&searchText2=&occurrences2=all&catSelect=part&prodVal=HA&date=custom&fMonth=1&fYear=2014&lMonth=11&lYear=2018&searchAttempt=486275213&searchType=advanced&doSearch=Search	111
# 17	Antenatal care and midwive /www.midwiferyjournal.com/action/doSearch?journalCode=ymidw&searchText1=antenatal+care+&occurrences1=all&op1=and&searchText2=midwive&occurrences2=all&catSelect=part&prodVal=HA&date=custom&fMonth=1&fYear=2014&lMonth=12&lYear=2018&searchAttempt=-644401 636&searchType=advanced&doSearch=Search	35

Asian Nursing Research on October 21, 2018

Search	Query	Records retrieved
# 18	Antenatal education www.asian-nursingresearch.com/action/doSearch?journalCode=anr&searchText1=antenatal+education&occurrences1=all&op1=and&searchText2=&occurrences2=all&catSelect=part&prodVal=HA&date=custom&fMonth=1&fYear=2014&lMonth=12&lYear=2018&searchAttempt=-233465741&searchType=advanced&doSearch=Search	1

Science Direct on October 21, 2018.

Search	Query	Records retrieved
# 19	Prenatal period and education www.sciencedirect.com/search/advanced?qs=prenatal%20period%20and%20education&show=25&sortBy=relevance&years=2018%2C2017%2C2015%2C2016%2C2014&lastSelectedFacet=years	6829

# 20	Midwive and patient education www.sciencedirect.com/search/advanced?qs=prenatal%20period%20and%20education&show=25&sortBy=relevance&years=2018%2C2017%2C2015%2C2016%2C2014&lastSelectedFacet=years	541

Appendix II: Excluded Studies

Barimani M FFK. Childbirth and parenting preparation in antenatal classes. Midwifery. 2018; 57 (March 2017):1-7.

Reason for exclusion: qualitative study

Barimani MFF. Midwifery. Childbirth and parenting preparation in antenatal classes. 2018 Feb;57:1-7.

Reason for exclusion: qualitative study

Barimari M. Childbirth and parenting preparation in antenatal classes. Midwifery. 2018;57:1-7.

Reason for exclusion: qualitative study

Caroline Joy Hollins MYR. Nurse Education in Practice. Women's views about the importance of education in preparation for childbirth. 2013 Nov;13(6):512-8.

Reason for exclusion: Es un estudio cualitativo

Chunyi Gu XW, Xinli Zhu, Zheng Zhang. International Journal of Nursing Studies. The effectiveness of a Chinese midwives' antenatal clinic service on childbirth outcomes for primipare: A randomised controlled trial. 2013;50(12):1689-97.

Reason for exclusion: No respond to the question

F.J.Soriano-Vidal RV-C. The effect of prenatal education classes on the birth expectations of Spanish women. The effect of prenatal education classes on the birth expectations of Spanish women. 2018 May;60:41-7.

Reason for exclusion: prospective study

Fenwick J TJ. Improving psychoeducation for women fearful of childbirth: Evaluation of a research translation project. Women and Birth. 2018;31(1):1-9.

Reason for exclusion: qualitative study

J.Allen SK. Midwifery. How does group antenatal care function within a caseload midwifery model? A critical ethnographic analysis. 2015 May;31(5):489-97.

Reason for exclusion: observacional study

Kuliukas LJH. The woman, partner and midwife: An integration of three perspectives of labour when intrapartum transfer from a birth centre to a tertiary obstetric unit occurs. Woman and Birth. 2017;30(2):e125-31.

Reason for exclusion: qualitative study

Levett KMS. The Complementary Therapies for Labour and Birth Study making sense of labour and birth – Experiences of women, partners and midwives of a complementary medicine antenatal education course. The Complementary Therapies for Labour and Birth Study making sense of labour and birth – Experiences of women, partners and midwives of a complementary medicine antenatal education course. 2016 Sep;40:124-31.

Reason for exclusion: qualitative study

M.Barimani KFF. Childbirth and parenting preparation in antenatal classes. 2018 Feb;57:1-7.

Reason for exclusion: qualitative study

Parat SN. Prenatal education of overweight or obese pregnant women to prevent childhood overweight (the ETOIG study): an open-label, randomized controlled trial. 2019;43(2):362-73.

Reason for exclusion: No interest for the question

Petra Pålsson EKP. First-time fathers experiences of their prenatal preparation in relation to challenges met in the early parenthood period: Implications for early parenthood preparation. First-time fathers experiences of their prenatal preparation in relation to challenges met in the early parenthood period: Implications for early parenthood preparation. 2017 Jun;50:Volume 50, July 2017, Pages 86-92.

Reason for exclusion: qualitative study

Sharmila Shrestha KA. Development and evaluation of a newborn care education programme in primiparous mothers in Nepal. Development and evaluation of a newborn care education programme in primiparous mothers in Nepal. 2016 Sep 1;42:21-28.

Reason for exclusion: this article refers to postnatal period

Shefaly Shorey LA. Informational interventions on paternal outcomes during the perinatal period: A systematic review. Women and Birth. 2019 Apr;32(2):145-e158.

Reason for exclusion: No respond to the question

Vivienne Brady JL. Space for human connection in antenatal education: Uncovering women's hopes using Participatory Action Research. Midwifery. 2017 Nov;55(August):7-14.