Women and Birth xxx (2017) xxx–xxx

Contents lists available at ScienceDirect

Women and Birth

journal homepage: www.elsevier.com/locate/wombi

Review article

Interventions for reducing fear of childbirth: A systematic review and meta-analysis of clinical trials

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ARTICLE INFO

Article history:
Received 9 June 2017
Received in revised form 22 September 2017
Accepted 16 October 2017
Available online xxx

Keywords:
Fear of childbirth
Antenatal class education
Hypnosis
Systematic-review
Meta-analysis

ABSTRACT

Introduction: Fear of childbirth is a problematic mental health issue during pregnancy. But, effective interventions to reduce this problem are not well understood.
Objectives: To examine effective interventions for reducing fear of childbirth.
Material and methods: The Cochrane Central Register of Controlled Trials, PubMed, Embase and PsycINFO were searched since inception till September 2017 without any restriction. Randomised controlled trials and quasi-randomised controlled trials comparing interventions for treatment of fear of childbirth were included. The standardized mean differences were pooled using random and fixed effect models. The heterogeneity was determined using the Cochran's test and I^2 index and was further explored in meta-regression model and subgroup analyses.
Results: Ten studies inclusive of 3984 participants were included in the meta-analysis (2 quasi-randomized and 8 randomized clinical trials). Eight studies investigated education and two studies investigated hypnosis-based intervention. The pooled standardized mean differences of fear for the education intervention and hypnosis group in comparison with control group were −0.46 (95% CI −0.73 to −0.19) and −0.22 (95% CI −0.34 to −0.10), respectively.
Conclusions: Both types of interventions were effective in reducing fear of childbirth; however our pooled results revealed that educational interventions may reduce fear with double the effect of hypnosis. Further large scale randomized clinical trials and individual patient data meta-analysis are warranted for assessing the association.

Statement of significance

Problem or issue

Due to negative outcomes of fear of childbirth, conflicting results reported in the literature and high recent focuses on planning different interventions to ameliorate this negative experience, it would be valuable to specify the most effective interventions that have been tested till this date.

What is already known

Several clinical trials have assessed the effects of various interventions for reducing fear of childbirth during and after pregnancy. But, the literature reported inconsistent findings.

What this paper adds

The present meta-analysis reveals that educational interventions and self-hypnosis can significantly reduce fear of childbirth. Besides, result suggests that educational interventions may reduce fear of childbirth twice as much. The findings highlights the role of antenatal education, in enhancing childbirth expectations and experiences.

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https://doi.org/10.1016/j.wombi.2017.10.007
1871-5192/

1. Introduction

Childbirth can be considered as an outstanding life event for every woman; however, this can be a fearful experience. Literature estimates that one in five pregnant women experience moderate fear of childbirth and 6–10% of all pregnant women suffer from a severe fear of childbirth (FOC) worldwide.[1–3] Parity and previous mode of birth (instrumental or caesarean section), depression, decisional conflict, low social support and less perceived knowledge were found to be associated with FOC.[3–5] It is highly likely that FOC complicates pregnancy and causes manifestations of anxiety and stress[6,7] leading to physical and psychological disorders including hypertension, preeclampsia, and post-traumatic stress disorder.[8–10] These complications would result in increased probability of obstetric interventions particularly emergency caesarean section that in turns, may lead to low birth weight and preterm labour.[11,12] Moreover, it has been shown that high levels of maternal stress during pregnancy can double the probability of emotional or behavioural problems in childhood period.[13]

Several studies have assessed interventions for reducing FOC during and after pregnancy. In a randomized controlled trial (RCT) conducted by Werner et al.[14] among 1222 healthy Danish nulliparous women, a brief course of self-hypnosis significantly ameliorated FOC experienced during 6 weeks after birth (mean W-DEQ B score of 42.9 in the hypnosis vs 47.5 in the care as usual group) while relaxation techniques did not have any significant influence on FOC (mean score of 47.2 vs 47.5).[14] Some other studies have examined the effect of psycho-education in nulliparous women and reported significant reduction in FOC measured during pregnancy and postpartum period.[15–17] For instance, in a study was conducted among 371 Swedish nulliparous women with severe fear of childbirth, by Rouhe et al.[17] a significant difference in W-DEQ B mean score was indicated between psycho-education group and control group (intervention group 63.0 ± 32 vs control group 73.7 ± 29). Moreover, a single-arm pilot study in Australia (2014), tested the effect of mindfulness-based childbirth education as a new model of childbirth education. This model that consists of mindfulness, communication and decision-making skills showed to be an significant effective intervention for reducing FOC.[18] Also, certain other studies assessed the effect of prenatal class education with different models and components on FOC resulting in significantly low levels of fear.[19–22] But, our understanding of the modifiable causes of FOC is not consistent and consequently there are no effective approaches to its reduction.

Due to negative outcomes of FOC, and high recent focuses on planning different interventions yielding in conflicting results presented in the literature, it would be valuable to specify the most effective interventions that have been tested till this date. We, therefore, aimed to investigate the pooled effect of interventions for reduction of the FOC during pregnancy and postpartum period using meta-analysis methods.

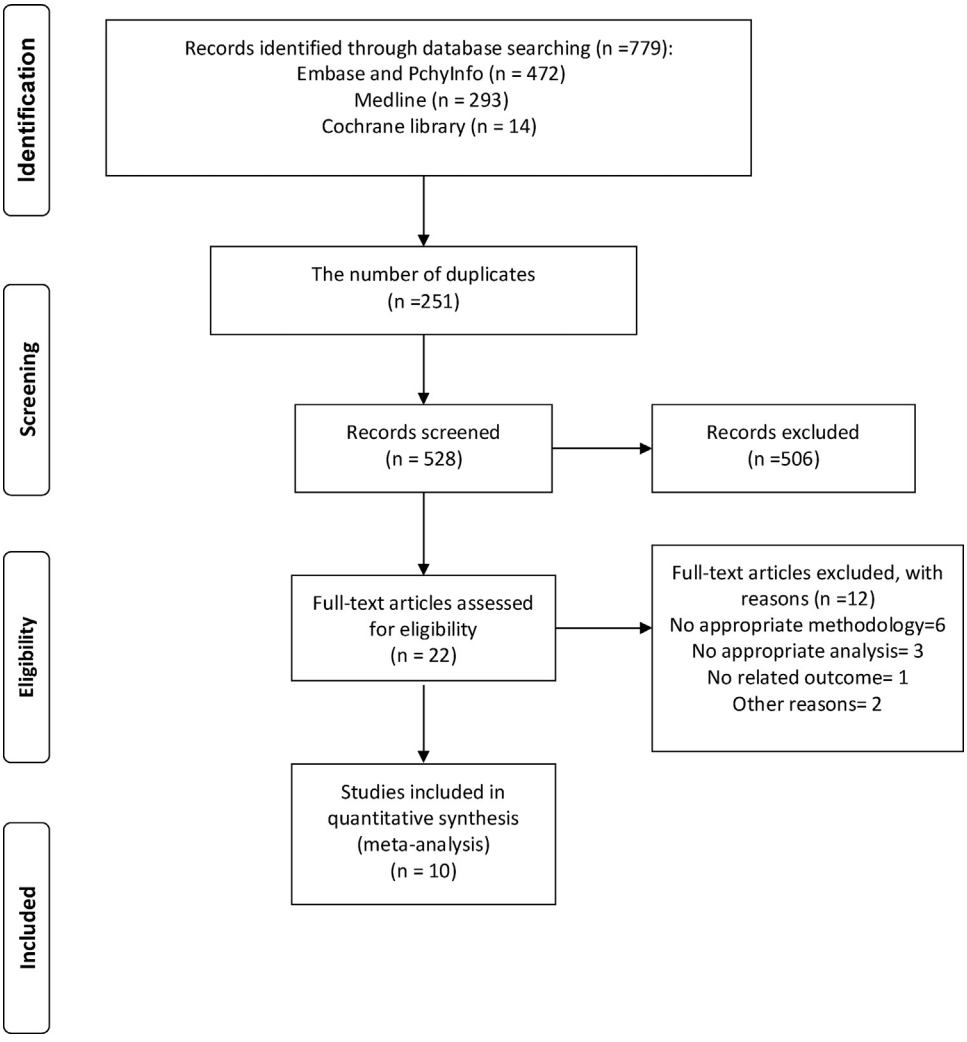

Fig. 1. Flow chart of study selection process.

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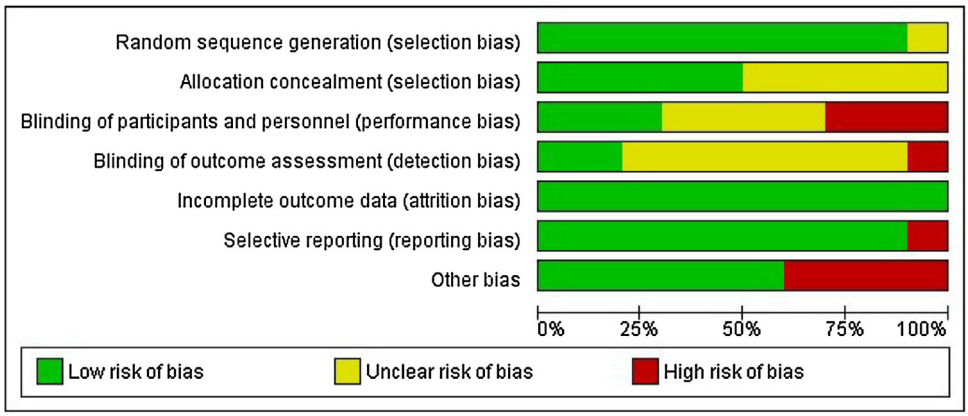

Fig. 2. Review authors' judgments about each risk of bias item as percentages across all included studies.

2. Methods

2.1. Inclusion and exclusion criteria

We included all type of clinical trials study which conducted on healthy pregnant (primiparous or multiparous) and postpartum women without restriction of language and time (Fig. 1). All the papers were included regardless of age, type of birth and number of pregnancies but studies on women with major mental disorder were excluded. Studies that were assessing FOC during pregnancy and postpartum as the first or secondary outcome were also included in the meta-analysis. We did not limit our review to a specific description of FOC and also included all types of measurements for this outcome. In terms of type of intervention, we included any type of intervention such as prenatal class education, psycho-education, consultation, and supportive care, different kinds of relaxation and relief pain techniques during labour. Interventions may have been executed individually or in a group during pregnancy and/or postpartum period, aiming to reduce FOC. We compared intervention group with control group received only prenatal and/or postnatal routine care.

2.2. Search strategy and selection procedures

A search strategy was developed using Medline search. Then, a systematic search was conducted on PubMed, Embase and Cochrane Central Register of Controlled Trials, PsycINFO for all relevant studies from their commencements until September 2017. The data was presented in a PRISMA chart. The clinical Trail.gov, controlled-trials.com, and UK Clinical Research Network were assessed to find registered clinical trial protocols in this field. We contacted authors of identified papers and asked them to identify other published or unpublished studies. The search was run on all reference lists of identified papers, review articles, meta-analyses, related editorial, and other relevant documents, with following key terms: 'fear of childbirth', 'fear of delivery', 'childbirth related fear', 'expectation of childbirth', 'experience of childbirth', 'prenatal fear of childbirth', 'postnatal fear of childbirth', 'tokophobia' and 'tocophobia'. The search process was conducted by a trained librarian and selection of eligible studies was performed by two authors (VMH and MN), independently. In the case of disagreement between reviewers, the publication was firstly discussed and if disagreement was not resolved, a third author was consulted.

2.3. Quality assessment and data extraction

Quality assessment was applied using the Cochrane Collaboration's tool for assessing risk of bias in randomised trials by two authors, independently. This is a standard tool for evaluation of methodological quality of clinical trials to detect any bias, comprising of random sequence generation, allocation concealment, blinding, incomplete outcome data, selective reporting, and other sources of bias. We used Review Manager

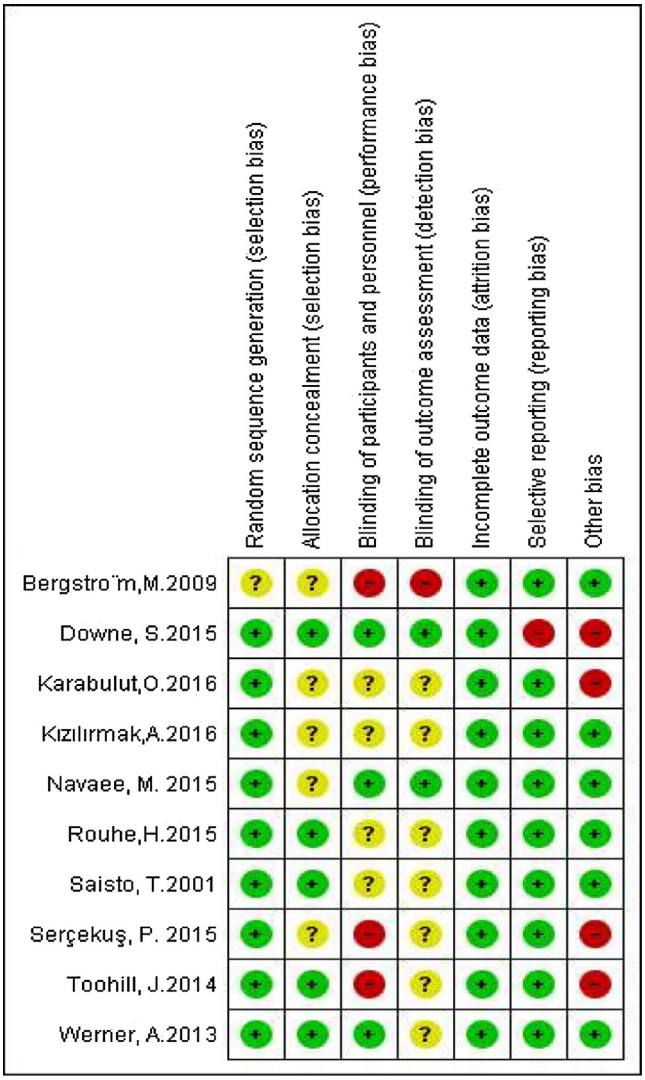

Fig. 3. Review authors' judgments about each risk of bias item for each included study.

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(RevMan)[23] software version 5.3 to provide risk of bias graph and summary (Figs. 2 and 3). A data extraction form was designed based on guidelines (Cochrane Handbook for Systematic Reviews of Interventions).[24] Extracted data consisted of author's name, year of publication, country, mean age, sample size, type of intervention, follow up time, instruments used for measuring fear of childbirth and main results. We contacted the authors to obtain more information about missing data or if there was any ambiguity in collected data.

2.4. Statistical methods

We extracted three pieces of information related to measure of association from each study including sample size, standard deviation (SD) and mean of outcome. The data were pooled as the standardized mean difference (SMD) of continuous variables with 95% confidence intervals (CI) using Cohen method ($mean_{intervention} - mean_{control}$/pooled standard deviation) and combined using both fixed and random effect models[25] with inverse variance weighting. The SMD is used as the preferred effect size in this meta-analysis because all the trials assess the same endpoint but measure it in different ways by different scales.[24] Fixed-effect models assume that there is only mean difference as interested effect size, which is extracted by each of the included clinical trial. In this model, the only source of variation is random error (variance within study) from individual clinical trials and the weight is equals to inverse of variance (weight = $1/var_i$, which i = each included study and var equals the observed within-study variance). But, random effect model assume that two sources of variation should be taken into account, first random error (similar to fixed effect model) and second referred to as tau,[2] variance between studies (weight = $1/(var_i + tau^2)$).[25] In the case of non-significant publication bias in the meta-analysis, random effect model will drive more conservative pooled estimation.[26] Therefore, random effect model was considered as the preferred model, because no significant publication bias was found in this study. We included both model results in the forest plot in order to properly interpretation of the finding.[27] The SMD was converted to odds ratio (OR) as an alternative and more intuitive measures of association using Hasselblad and Hedges' method, based on the logistic distribution assumption.[28] The presence of heterogeneity was determined using the Cochran's Q test with a significance level of <0.05 combined with an I^2 and tau^2 statistic.

Significant heterogeneity was explored further through meta-regression models and subgroup analyses. We conducted meta-regression analysis and correspondent plot for assessing the role of important variables on the potential heterogeneity. Publication bias (small study effect) was examined with the Egger's test. All analyses were conducted using Stata software version 14.1.

Table 1
Characteristics of included studies.

First author	Date of publication	country	Total participants' mean age	Type of clinical trial	Final sample size	Kind of intervention	Outcome measurement	Time of outcome measurement	Results
Kızılırmak, A.	2016	Turkey	22.35	RCT	CG:45 IG:44	Preparatory labor education	W-DEQ-A	38–40th weeks of gestation	Significant reduction of fear of childbirth
Karabulut, O.	2016	Turkey	27.3	quasi-experiment	CG:123 IG:69	Antenatal education	W-DEQ-A	30–34th weeks of gestation	Significant reduction of fear of childbirth
Serçekuş, P.	2015	Turkey	28.25	quasi-experiment	CG:27 IG:28	Antenatal education	W-DEQ-A	34–36th weeks of gestation	Significant reduction of fear of childbirth
Navaee, M.	2015	Iran	24	RCT	CG:32 IG:35	Role play education	Harman Childbirth Attitude Questionnaire (CAQ)	36–38th weeks of gestation	Significant reduction of fear of childbirth
Rouhe, H.	2015	Sweden	29.35	RCT	CG:240 IG:131	Group psychoeducation with relaxation exercises	W-DEQ-B	3 months after delivery	Significant reduction of fear of childbirth
Downe, S.	2015	UK	28.45	RCT	CG:334 IG:336	Self-hypnosis training in addition to usual care	Seven point scale for fear of childbirth	2 weeks after delivery	Significant reduction of fear of childbirth
Toohil, J.	2014	Australian	29.1	RCT	CG:97 IG:101	Telephone psycho-education counseling	W-DEQ-A	36th weeks of gestation	Significant reduction of fear of childbirth
Newham JJ	2014	UK	31	RCT	CG:22 IG:29	Antenatal yoga courses	W-DEQ-A	28th weeks of gestation	Significant reduction of fear of childbirth
Werner, A.	2013	Denmark	29.73	RCT	CG:222 IG1:485 IG2482	Self-hypnosis Relaxation	W-DEQ-B	6 weeks after delivery	Significant reduction of fear of childbirth in the hypnosis vs relaxation group but no significant in hypnosis vs control and relaxation vs control group.
Bergström, M.	2009	Sweden	28.7	RCT	CG:493 IG:484	Antenatal education (psychoprophylactic training)	W-DEQ-B	3 months after delivery	No improvement in fear of childbirth
Saisto, T.	2001	Finland	31.55	RCT	CG:91 IG:85	Intensive cognitive therapy group	Personal concerns scale (birth-related concerns)	Around 37th weeks of gestation	Significant reduction of fear of childbirth

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3. Results

3.1. Selection and characteristics of included studies

A total of 779 citations were retrieved of which 10 studies totalling 3984 participants were included in the final analysis.[14–17,19–22,29,30] Overall, 769 studies were excluded because of duplication (n = 251), unrelated designs and irrelevant outcomes (n = 518). The flowchart of the studies selection procedure was exhibited in Fig. 1. The important general and methodological characteristics of each study are showed in Table 1 and a list of included and excluded studies with the reason of inclusion are illustrated in Supplementary Table S1 (in the online version at DOI: 10.1016/j.wombi.2017.10.007).

Of the ten studies, two studies were Quasi-RCT and the rest were RCT. All the selected studies had full-paper publications. Studies were undertaken in middle and high income countries (Turkey (n = 3), Sweden (n = 2), Denmark, Finland, the UK, Australia and Iran (n = 1 each)). Four studies investigated antenatal class education,[19–22] four studied psycho-education[15–17,29] and two studied hypnosis based intervention.[14,30] Seven studies used the Wijma Delivery Expectancy/Experience Questionnaire (W-DEQ) which is validated for the measurement of childbirth fear both pre and postnatal.[14,16,17,19–21,29] The mean age of the participants was 27.87 years (±2.74 SD) and the quality assessment of the studies showed that fulfilment for randomization was fairly consistent across studies (Table 2).

3.2. Meta-analysis of educational interventions

First, an overall meta-analysis was performed, where education was the main intervention. Eight SMDs were included for the analysis. Based on the results obtained through Egger's regression, non-significant publication bias was found ($p < 0.63$). The pooled SMD of FOC for the education intervention group in comparison to control group was −0.46 (95% CI −0.73 to −0.19) with a significant level of heterogeneity ($I^2 = 84.8\%$, $p < 0.001$). The transformed OR of FOC for the pooled intervention group data compared to the pooled control group data estimated from SMD was 0.43 (95% CI 0.26 to 0.70). This suggests that educational interventions were associated with about a three-fold reduction in the FOC. The meta-analysis of randomized data based on subgroup analysis of different educational interventions showed a SMD of −0.61 (95% CI −0.93 to −0.30) for antenatal class education and a non-significant reduction of −0.31 (95% CI −0.69 to 0.06) for psycho-education. The significant heterogeneity was seen in the psycho-education subgroup but not for class education (Fig. 4). In addition, subgroup analysis by design of studies indicates that the pooled result from the two quasi experimental studies did not demonstrate a significant association (SMD = −0.63; 95% CI −1.28 to 0.02; $I^2 = 76.8\%$; $p = 0.03$) but the pooled result from RCTs was significant and heterogeneous (SMD = −0.41; 95% CI −0.73 to −0.09; $I^2 = 87\%$; $p < 0.001$) (Fig. 5). Subgroup analysis according to the Cochrane collaboration's tool for assessing risk of bias is given in Table 2.

3.3. Meta-regression results

Meta-regression model of SMD and mean age of participant showed that the overall difference between educational intervention and control groups has decreased by 37%, from −0.75 in 22 years olds to −0.38 in 32 years olds ($p = 0.32$). The result showed that intervention in younger women might be more effective, but the association was not statistically significant which could be due to small number of included study in meta-regression model (Fig. 6). Also, meta-regression model with including year of publication as a covariate in the model indicated that on average newer studies reported more protective effect for educational intervention (Fig. 7). All other potential variables included in the meta-regression model did not showed any meaningful association.

Table 2
Comparisons of standardized mean difference based on intervention type, design and different level of risk of bias.

Subgroups	n	SMD	95% CI	I^2%	Ph
Type of intervention					
Prenatal class education	4	−0.61	−0.92 to −0.30	54.3	0.08
Cognitive behavioral therapy	4	−0.31	−0.69 to 0.06	89.6	<0.001
Type of study					
Quasi	2	−0.63	−1.28 to 0.02	76.8	0.03
Random	6	−0.41	−0.73 to −0.09	87.0	<0.001
Duration					
Antenatal	3	−0.68	−1.10 to −0.25	68.7	0.04
Postnatal	5	−0.32	−0.66 to 0.02	87.6	<0.001
Quality assessment					
Random sequence generation					
H	1	−0.34	−0.63 to −0.04	–	–
L	5	−0.66	−0.93 to −0.39	64.3	0.02
NC	1	−0.02	−0.15 to 0.11	–	–
Allocation concealment					
H	0	–	–	–	–
L	2	−0.58	−1.05 to −0.11	85.3	0.009
NC	5	−0.48	−0.86 to −0.11	84.9	<0.001
Blinding of participants					
H	3	−0.59	−1.28 to 0.09	94.20	<0.001
L	1	−0.43	−0.92 to 0.05	–	–
NC	3	−0.46	−0.72 to −0.21	55.4	0.10
Incomplete outcome data					
H	0	–	–	–	–
L	7	−0.51	−0.80 to −0.22	86.7	<0.001
NC	0	–	–	–	–
Selective outcome reporting					
H	0	–	–	–	–
L	7	−0.51	−0.80 to −0.22	86.7	<0.001
NC	0	–	–	–	–
Other sources of bias					
H	3	−0.69	−1.09 to −0.29	73.0	0.02
L	4	−0.37	−0.70 to −004	84.6	<0.001
NC	0	–	–	–	–

SMD: standardized mean difference; I-squared: the variation in SMD attributable to heterogeneity; Ph: P-value for heterogeneity within each group; H: high risk of bias; L: low risk of bias; NC: not cleared.

3.4. Hypnosis intervention

Two studies reported interventions based on hypnosis (Fig. 8). In the absence of any significant heterogeneity ($I^2 = 0.0\%$, $p = 0.64$), the FOC was significantly lower in the group with this type of intervention. The pooled SMD for the hypnosis group in comparison to control group was −0.22 (95% CI −0.34 to −0.10) based on fixed effect model. According to extracted OR from the SMD, we can conclude that hypnosis is associated with 1.5 time reduction in the chance of FOC.

4. Discussion

The present study is the first meta-analysis to focus exclusively on all types of interventions to reduce childbirth fear. This found a significant effect of educational interventions and hypnosis on reducing FOC during pregnancy and postpartum period. Our meta-analysis suggests that the educational interventions may be more effective in this regard compared to the hypnosis interventions in declining FOC.

The factors that are generally cited as being associated with fear of childbirth are lack of accurate and sufficient knowledge about pregnancy and childbirth; having low level of self-esteem and self-efficacy; losing control on one's own body; and not receiving

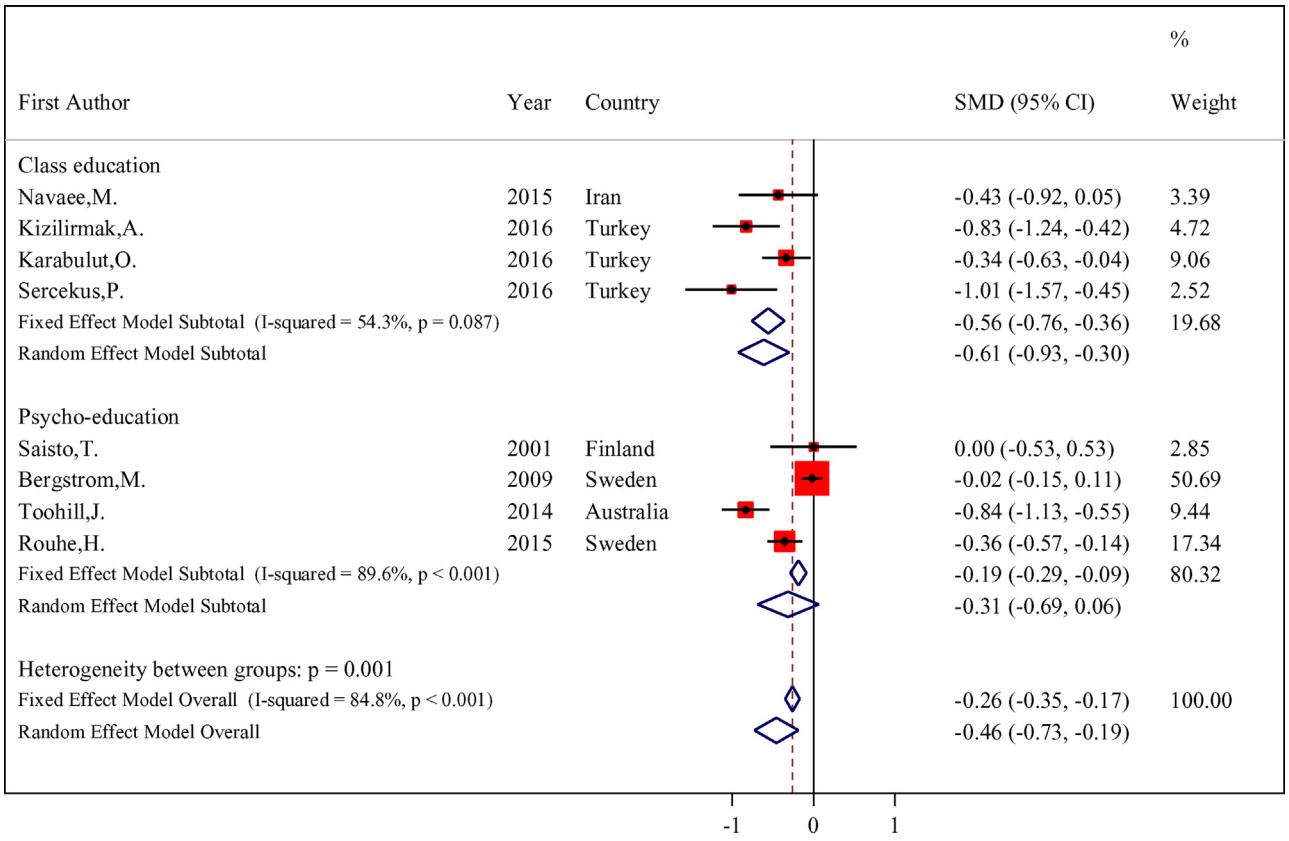

Fig. 4. Fixed and random effect model meta-analysis of interventions for reduction of childbirth fear according to type of interventions.
Negative values represent favours intervention and positive values represent favours control. SMD: standardized mean difference, I-squared: percentage of total variation across studies that is due to heterogeneity rather than chance (I-squared = 100% × (Q − df)/Q, where Q is Cochran's heterogeneity statistic and df the degrees of freedom). Weight: inverse-variance weighting. For each study, areas of square are proportional to weight (sample size), horizontal line indicate 95% confidence interval, and diamonds indicate pooled effect measures.

adequate social support particularly from partner and or husband.[5,31,32]

Most antenatal education classes largely focus on teaching about pregnancy, childbirth processes and labour, midwifery and nursing practices during labour and also being familiar with birthing suite. Providing these information would change attitudes and believes of pregnant women toward pregnancy and childbearing, may leading to a positive perception of labour and consequently, more positive experiences of childbirth.[19,20,33] However, if the educational content of these classes is not adequately designed, it would increase the perceived levels of fear. Based on Rachman[34] and Barlow,[35] indirect transmission via information is one of the pathways of fear acquisition. This can happen when lots of alarming information and education of dangers are transmitted by educators, creating a feeling of being at risk during pregnancy and childbearing and might provoke fear sensation especially in vulnerable women.

In addition, prenatal classes aim to improve coping strategies with pain of labour, and improved skills in stress management and family relationships through involving the woman's partner in education. Moreover, these classes can help women to gain confidence in their bodies leading to enhanced level of childbirth self-efficacy and self-control.[36]

Regarding the effect of prenatal class education in comparison with psycho-education, our meta-analysis suggests more effectiveness of antenatal class education. Consistent with this result, Kızılırmak and Başer[19] reported that a 70 min preparatory labour education performed on primi-gravida women in two sessions at the third trimester was significantly effective in decreasing fear of birth. Similar to this, Serçekuş and Başkale[21] provided a 16-h antenatal class education in third trimester of pregnancy and participants in the intervention group presented significantly lower W-DEQ A mean score. In contrast, Bergström et al.[29] did not find any significant improvement in experience of childbirth after performing psychoprophylactic training during third trimester of pregnancy (breathing and relaxation techniques). Whilst, Rouhe et al.[17] revealed a significant effect of group psycho-education classes and relaxation exercise during pregnancy on experience of childbirth in 3 months of postpartum among women suffering from severe fear.

Although psycho-education interventions have recently draw a lot of attention, it seems that changing mothers' believes and attitudes through informing pregnant women about childbirth process and related practice can have substantial influences on levels of their fear. This may prove the importance of being aware and informative about childbearing events and its role in constructing positive experience and expectation of childbirth. Nevertheless, number of studies in this field is not as large as drawing a definitive conclusion and therefore this finding should be tested in future large scale RCTs with multiple arms that are designed to test the effect of both approaches. In addition, two studies in this subgroup had screened participants for severe fear of childbirth before intervention by means of different cut-offs of WDEQ. Rouhe et al.[17] used WDEQ scored ≥100 and Toohil et al.[16] used WDEQ scored ≥66. Hence, the lower impact of psycho-education interventions in comparison to prenatal class education can be a result of this inconsistency in included participants.

The current meta-analysis indicates a positive impact of self-hypnosis training on postnatal experience of childbirth. In a large RCT study conducted by Werner et al.[14] a brief course in self-

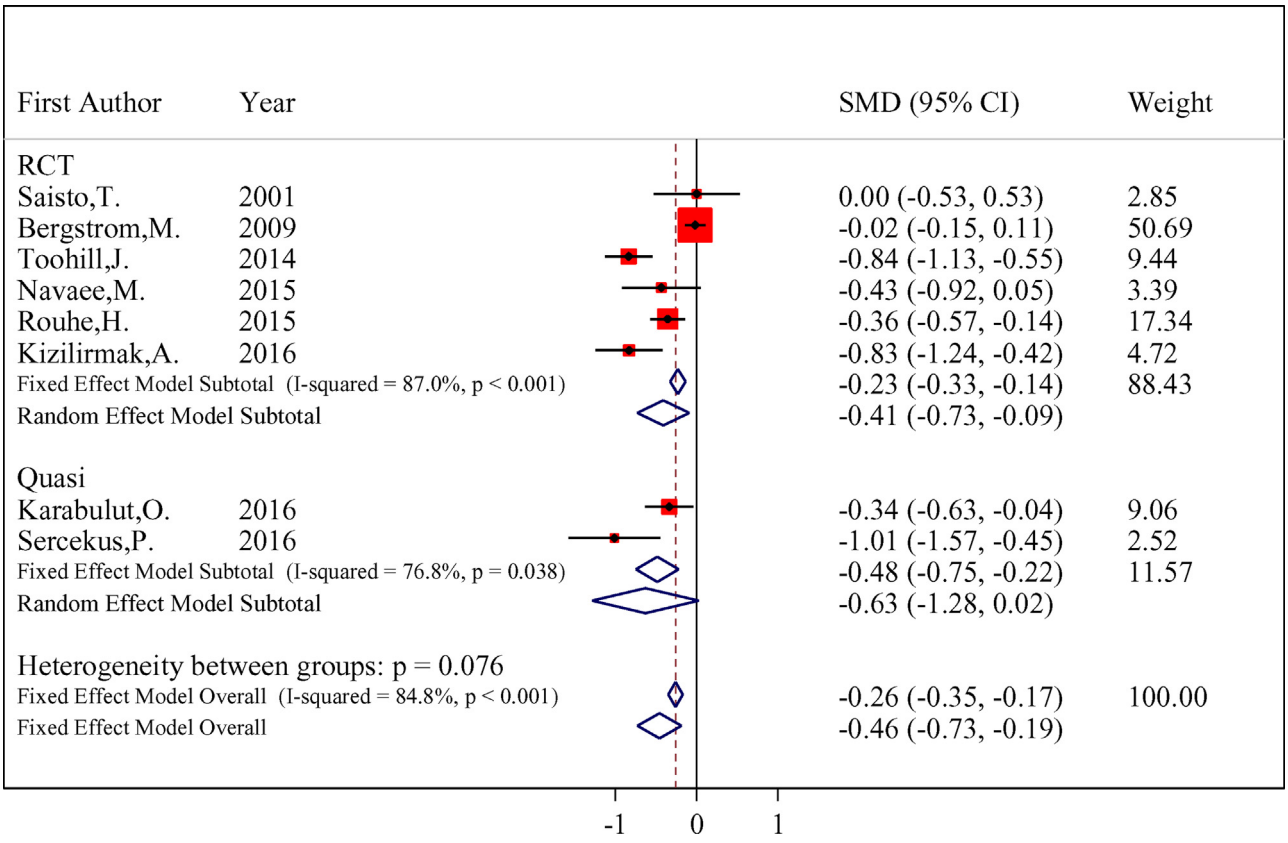

Fig. 5. Fixed and random effect model meta-analysis of interventions for reduction of childbirth fear according to design of studies.
Negative values represent favours intervention and positive values represent favours control. SMD: standardized mean difference, I-squared: percentage of total variation across studies that is due to heterogeneity rather than chance (I-squared = 100% × (Q − df)/Q, where Q is Cochran's heterogeneity statistic and df the degrees of freedom). Weight: inverse-variance weighting. For each study, areas of square are proportional to weight (sample size), horizontal line indicate 95% confidence interval, and diamonds indicate pooled effect measures.

hypnosis significantly ameliorated the women's FOC experienced at 6 weeks after birth.[14] Self-hypnosis can relieve pain and decrease demand for chemical pain relief through stimulating the release of the endorphins as natural painkillers and suppression of neural activity to inhibit the emotional interpretation of sensations such as pain.[37,38] Also, there are several different findings showing benefits of self-hypnosis on duration of birth,[39,40] complications[38,41,42] and postpartum depression[43,44] that all of them have been known as sources of maternal stress causing fear and negative childbirth experience. The results of our study are in contrast with

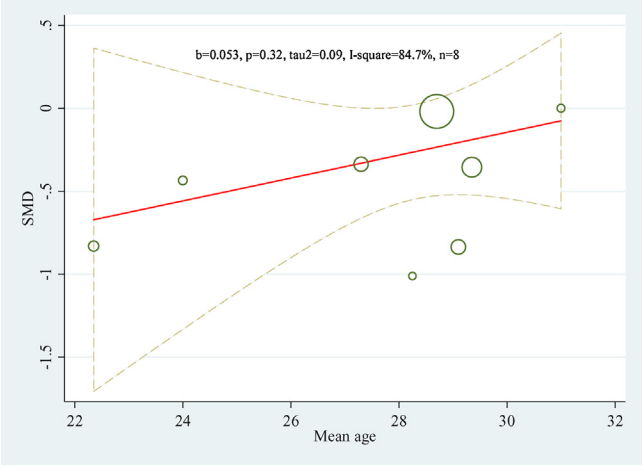

Fig. 6. Meta-regression of standardized mean difference (SMD) and mean age of participant.
Negative values represent favours intervention and positive values represent favours control. The regression coefficient (b) describe how the outcome measure (SMD) changes with a unit increase in the mean age as an effect modifier. Open circles represent included studies in the meta-analysis, solid red line indicate perfect fit line and dashed light brown lines indicate 95% confidence interval

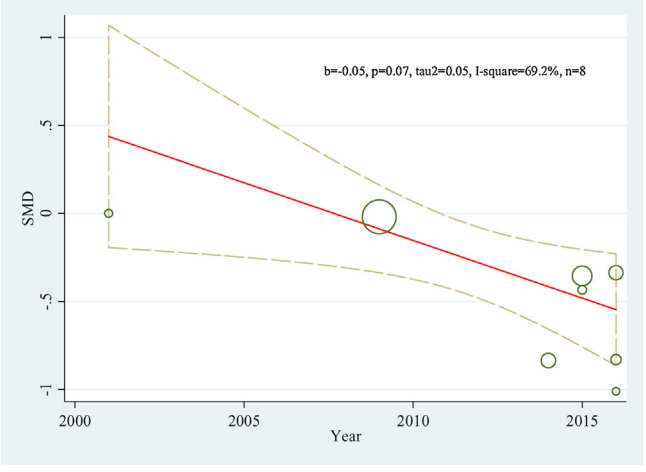

Fig. 7. Meta-regression of standardized mean difference (SMD) and year of publication.
Negative values represent favours intervention and positive values represent favours control. The regression coefficient (b) describe how the outcome measure (SMD) changes with a unit increase in the year of publication as an effect modifier. Open circles represent included studies in the meta-analysis, solid red line indicate perfect fit line and dashed light brown lines indicate 95% confidence interval.

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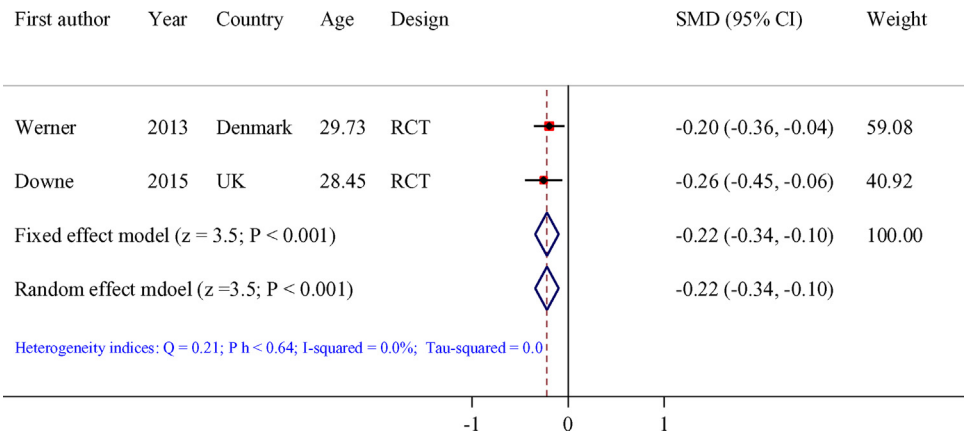

Fig. 8. Fixed and random effect model meta-analysis of hypnosis interventions for reduction of childbirth fear.
Negative values represent favours intervention and positive values represent favours control. SMD: standardized mean difference, I-squared: percentage of total variation across studies that is due to heterogeneity rather than chance (I-squared = 100% × (Q − df)/Q, where Q is Cochran's heterogeneity statistic and df the degrees of freedom). Weight: inverse-variance weighting. For each study, areas of square are proportional to weight (sample size), horizontal line indicate 95% confidence interval, and diamonds indicate pooled effect measures.

a Cochrane systematic review reporting lack of a difference between debriefing and standard postnatal care in preventing psychological trauma.[45] It is worth noting that the review was based on just one RCT which examined the effect of group counselling on childbirth fear after emergency caesarean via WDEQ-B.[46] We did not include this RCT in analysis due to unavailability of relevant data related to the FOC results.

Our review has a number of limitations. First, for some studies, the relevant data were not available, even after contacting the author[46–48] second not all the studies used a consistent measure of fear; third some studies screened participants for severe fear of birth with different scores on WDEQ, fourth they did not measure fear at consistent time points, and finally the number of included studies in this meta-analysis is small for having a conclusive interpretation. All of these may be important source of heterogeneity in interpretation of the pooled result.

In conclusion, the present meta-analysis reveals that both educational interventions and self-hypnosis can significantly reduce FOC. Compared with the self-hypnosis, our pooled result suggests that educational interventions may reduce fear of childbirth twice as much. This result highlights the role of antenatal education in enhancing childbirth expectations and experiences. Further clinical trials with large sample size are still needed, especially on women with severe fear of childbirth, in order to establish the most efficient and cost-effective practices with high acceptability and adherence among women in pregnancy and postpartum. Moreover, future studies can look into midwife-led education versus physician-led education, individual or small group versus large group interventions, and maternal education only compared to both maternal and paternal education to see if there are any differences in reducing FOC.

Disclosure of financial support

There was no funding source for this meta-analysis research.

Contribution to authorship

VM and MN formulated the hypothesis, designed the study, prepared the draft and together with SH J wrote the protocol. VM conducted literature searches and provided summaries of previous research studies and study selection. MN conducted the statistical analysis. All authors equally drafted the work, revised it critically for important intellectual content. All authors contributed to critical appraisal of article and have approved the final manuscript.

Acknowledgment

We respectfully express our gratitude to Dr. Soo Downe, Research in Childbirth and Health (ReaCH) group, University of Central Lancashire, Preston, UK, for her valuable guidance and advice in writing this paper.

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Please cite this article in press as: V. MoghaddamHosseini, et al., Interventions for reducing fear of childbirth: A systematic review and meta-analysis of clinical trials, Women Birth (2017), https://doi.org/10.1016/j.wombi.2017.10.007