Midwifery 84 (2020) 102666

Contents lists available at ScienceDirect

Midwifery

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

Review Article

Hypnosis-based interventions during pregnancy and childbirth and their impact on women's childbirth experience: A systematic review

Stephanie Catsaros[a,b,*], Jaqueline Wendland[c,d]

[a] Perinatal Home Hospitalization Unit, Hopidom, University Hospital of Lille, France
[b] Pain Medicine Unit, Saint Vincent of Paul, Lille Catholic University Hospital, France
[c] Laboratory of Psychopathology and Health Processes, Université de Paris, F-92100 Boulogne-Billancourt, France
[d] Vivaldi Parent-Infant Mental Health Unit, Pitié-Salpêtrière Hospital, Paris, France

ARTICLE INFO

Article history:
Received 19 November 2019
Revised 4 February 2020
Accepted 11 February 2020

Keywords:
Hypnosis
Hypnotherapy
Self-hypnosis
Pregnancy
Childbirth
Childbirth experience
Systematic review

ABSTRACT

Background: Hypnosis has been increasingly used in recent years in healthcare, with several applications during pregnancy, labor and birth. Yet, few studies have assessed the impact of hypnosis on women's childbirth experience.

Aim: This systematic review examines the use and effects of hypnosis-based interventions during pregnancy and childbirth on women's childbirth experience.

Methods: A literature search was performed on several databases (Science Direct, PsychINFO and PubMed). Published articles reporting on hypnosis-based interventions carried out during pregnancy and/or childbirth that evaluated childbirth experience were included in the review. The articles were assessed with the Mixed Methods Appraisal Tool (MMAT).

Key findings: Nine articles met the inclusion criteria. The methodological value of the articles was limited for half of the studies (four studies scored 60% or less on the MMAT). Despite this methodological limitation, the results suggest a positive impact of hypnosis-based interventions on childbirth experience, in alleviating fear and pain and enhancing sense of control during labor. The hypnosis-based interventions improved women's emotional experiences and outlook towards birth, with less anxiety, increased satisfaction, fewer birth interventions, more postnatal well-being and better childbirth experience overall.

Implications for practice: The findings of this review suggest that hypnosis-based interventions improve childbirth experience. Further studies should be undertaken in order to better determine and develop hypnosis-based interventions aiming at improving this experience. Such interventions could enhance several aspects of the childbirth experience by taking into account women's partners, medical and surgical history, narratives of childbirth and specific aspects of complicated pregnancies that women can go through.

Introduction

Pregnancy is an extremely crucial and challenging period in a woman's life, as it constitutes a transitional and transformative process, including many co-occurring psychological, physical and social changes (Saxbe et al., 2018). Furthermore, as a mother-to-be, questions like whether being able to be a good mother and links to one's own personal history will often emerge (Bydlowski, 2001). This 'emotional rollercoaster' (Mitchell, 2016) can greatly impact the way pregnancy and childbirth will be experienced, as a highly subjective event. What will make a pregnancy or childbirth a positive, negative or even traumatic experience therefore depends on a variety of facts, making it very challenging to predict (Salmon and Drew, 1992).

During her pregnancy, a woman will experience body changes, weight gain, which will often lead to an important modification of her body image (Watson et al., 2016; Breda et al., 2015; Brown et al., 2015). She may also experience sleep disorders (Gooley et al., 2018; Oyiengo et al., 2014), and various physical symptoms may appear, such as pain, discomfort in breathing or

* Corresponding author: Hopidom, Pavillon Paul Boulanger, Boulevard du Pr. Leclercq 59000, Lille, France.
E-mail address: stephanie.labalette@chru-lille.fr (S. Catsaros).

https://doi.org/10.1016/j.midw.2020.102666
0266-6138/

nausea and vomiting. There are also frequently symptoms of anxiety (Robertson Blackmore et al., 2016), and of anxious anticipation of the labor, notably: "fear of childbirth" (Moghaddam Hosseini et al., 2018). This latter refers to a fear of not being able to give birth, or an important anxiety over labor pain or unexpected complications.

All of these conditions underline the mind and body interactions at work during pregnancy, as adverse physical conditions can impact psychological well-being and vice versa (Woods et al., 2010; Christian, 2012). This interconnectedness makes the use of mind and body interventions relevant during pregnancy (Urech et al., 2010; Marc et al., 2011). In this paper, we focus our attention on one of these interventions, hypnosis.

Background

Defining hypnosis

Hypnosis has gained increased attention over the last decades as a clinical intervention in the field of health, although it still remains underused (Yeh et al., 2014). The medical world is gradually admitting it as a valid intervention, as several studies have demonstrated its efficacy in different domains (Wark, 2008; Cowen, 2016). Historically, hypnosis is a very ancient medical practice (Wolberg, 1964). It has often been confronted with wide misunderstanding, confounded with mystical and spectacular representations, among both the general population and part of the medical world, therefore often keeping hypnosis in the marginal periphery of medicine (Graus, 2014).

Hypnosis can be defined as "*as an animated, altered, integrated state of focused consciousness, that is, controlled imagination*" and as "*an attentive, receptive state of concentration that can be activated readily and measured*" (Spiegel and Greenleaf, 2005, p. 113). In this state of altered consciousness and focused attention, patients are in contact with their imagination, and will respond to suggestions of change in the way they experience and perceive themselves and their environment, without the restrains and defense mechanisms at power in a usual wake condition. This depicts how, on an unconscious level, the mind can influence and change the way one perceives her or his own body.

The patient/hypnotherapist relationship is emphasized (Cowen, 2016) and the use of the word 'hypnosis' is stressed out as being significant in the achievement of the hypnotic trance (Green et al., 2005; Gandhi and Oakley, 2005). By helping patients experience new ways of thinking and exploring new possibilities, hypnosis allows them to achieve therapeutic goals by making them attainable (Araoz, 2005). Self-hypnosis can also be an important part of the hypnosis-based intervention: Patients learn how to proceed to self-induced trance, in order to prolong therapeutic gain (Spiegel and Greenleaf, 2005), thus increasing the sense of independence and autonomy.

The ramifications of the use of hypnosis in the medical field are extremely wide. The main corpus of existing studies is in the pain field, with very well-documented effectiveness (Thompson et al., 2019). Hypnosis has shown promising results in treating depression (Dobbin et al., 2009; Shih et al., 2009), anxiety (Hammond, 2010; Schnur et al., 2008; Kraft and Kraft, 2009), anxious anticipation of medical interventions and pain (Marc et al., 2009; Dominguez-Ortega and Rodriguez-Munoz, 2010), sleep disorders (Becker, 2015), obesity (Sapp et al., 2007), nausea and vomiting (Dominguez-Ortega and Rodriguez-Munoz, 2010; Richardson et al., 2007), and sense of self-efficacy (Barker et al., 2010), among other conditions (Cowen, 2016; Wark, 2008).

Pregnancy, childbirth and hypnosis

Hypnosis-based interventions have been used for many decades in the perinatal field (Werner et al., 1982; Davidson, 1962). These interventions may occur during different periods from the conceiving process to childbirth, and in some cases, in the postnatal period (James, 2009). In the prenatal period, hypnosis focuses on preparing women for the forthcoming birth, by reframing the representation of labor from a painful and difficult experience to a nonthreatening one, whilst giving them the possibility to use this technique during labor (Beebe, 2014). Hypnosis assists women in the bonding process, as it enhances their body awareness and link to their babies, while empowering them with confidence in their capacity to go through birth (Mongan, 2016).

Several systematic reviews have been carried out investigating the use and effectiveness of hypnosis-based interventions, mainly focusing on pain relief interventions during labor and childbirth. These show some effectiveness in reducing overall analgesia use during labor, a better infant Apgar score and a shorter Stage 1 labor (Cyna et al., 2004; Landolt and Milling, 2011; Madden et al., 2016). A systematic review of the use of hypnosis in the treatment of hyperemesis gravidarum, showed encouraging outcomes (McCormack, 2010). Hypnosis-based interventions can also significantly reduce fear of childbirth (Moghaddam Hosseini et al., 2018), but have yet to give conclusive results in inducing labor (Nishi et al., 2014), or in preventing postnatal depression (Sado et al., 2012). However, recent literature suggests the effectiveness of hypnosis in alleviating postpartum psychological symptoms, such as anxiety and depression (Beevi et al., 2016, 2019).

Childbirth experience

Existing literature has underlined how a woman's childbirth experience can be independent of factors considered as objectively measurable. Perceived support, involvement in decision-making, being informed and feeling in control can be factors as powerful in predicting childbirth experience as pain and interventions during labor (Lavender et al., 1999). Moreover, women's expectations, perceived support from caregivers and quality of relationship with them, and feeling involved in the decision-making, seem to be able to counteract factors such as physical birth environment, pain, immobility and medical interventions (Hodnett, 2002).

Childbirth is a subjective experience, influenced by a plethora of factors (Smarandache et al., 2016). It is "*an individual life event, incorporating interrelated subjective psychological and physiological processes, which in turn are influenced by social, environmental, organisational and policy contexts*" (Larkin et al., 2009, p. 49). The maternal experience will subsequently affect many other crucial areas and possibly leave an enduring impression on women for many years after giving birth (Bossano et al., 2017).

There can be many wide and long-lasting repercussions of a negative childbirth experience such as Post-Traumatic Stress Disorder symptoms (Gartus-Niegel et al., 2013) and post-partum psychological distress (MacKinnon et al., 2017). These negative experiences can affect women's relationship with their partners and mother-infant bonding (Ayers et al., 2006), possibly leading to subsequent impaired children's cognitive and emotional development (Murray et al., 2003).

Key factors that have been found to influence the perception and subjective experience of childbirth are quality and continuity of relation with caregivers (Dahlberg and Aune, 2013), expectations, representations of an ideal childbirth, perceived control, perceived support from a partner, pain during labor, duration of labor, unexpected interventions and mode of birth (Hodnett, 2002; Lavender et al., 1999). Further core concepts include empowerment and sense of achievement (Lundgren, 2005), or the process

of "getting there" (Larkin et al., 2012). The feeling of success in this case is far from being a sole physical achievement of having a liveborn and healthy child. While physical security is indeed crucial, it does not suffice to guarantee a positive birth experience (Carquillat et al., 2016).

The multidimensional aspect of childbirth experience explains the diversity of the evaluating tools used in the different studies and shows to what extent its comprehension is challenging (Larkin et al., 2009). However, taking into account these subjective features of childbirth is crucial when designing and providing care for pregnant women.

The aim of this review is to understand how hypnosis-based interventions can impact on women's attitudes towards birth and/or the subjective experience of childbirth overall. Having a clear perspective of these interventions and their outcomes will help us understand what still needs to be researched, clarified or demonstrated in future studies. This knowledge can also contribute to the design of future hypnosis-based interventions by focusing on specific aspects of the childbirth experience in order to improve its subjective perception.

Method

Design and research question

This review was conducted in a systematic way and the process was reported according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement (Moher et al., 2009). We framed our research question according to the PICO (Population, Intervention, Comparison, and Outcome) framework (Huang et al., 2006): What is the impact of the different hypnosis-based interventions on women's childbirth experience?

Inclusion criteria

- Articles published in English between 2000 and 2019 (last research date was on June 18th 2019), which clearly identified their interventions as hypnotic;
- The interventions had to relate to pregnant adult women, during pregnancy, and/or during labor. As the aim of this review was to explore all interventions occurring in the field of pregnancy and childbirth that assessed their impact on the subjective experience of childbirth, we chose to select all published interventions, including case studies, which had an explicit description of the hypnosis-based protocol that was carried out;
- The research protocols had to include assessment and evaluation of women's subjective experience of childbirth overall, or an aspect of their experience, such as fear or anxiety related to labor, or childbirth in general;
- Both qualitative and quantitative studies were included if they used specific evaluating tools or self-reported measures of some aspect of the childbirth experience, or the childbirth experience overall.

Exclusion criteria

The following were excluded:

- Articles that referred to terms like 'active relaxation', rather than hypnosis;
- Articles describing interventions during the process of conceiving, during pregnancy terminations, after miscarriages or in the postnatal period;
- Articles that did not take into consideration the subjective experience of women.

When two articles referred to the same research protocol, we chose to include the one being most relevant to our inclusion criteria.

Data search and screening

This literature search was carried out on PubMed, PsycInfo, Science Direct and Google Scholar. We used the following search combination:

(hypnosis OR hypnotherapy OR "self-hypnosis") AND (pregnancy OR childbirth OR "childbirth experience"). Articles were also searched through reference lists of different relevant texts.

After the first application of the search string on different databases, duplicates were removed. Remaining articles were first screened by titles for relevance and then abstracts were analyzed for compliance with the inclusion criteria. When in doubt, the full-text was analyzed for compliance and the authors discussed the final inclusion of the articles. The data collection process is presented in the prisma flow (Fig. 1).

We investigated the included articles by the following criteria: design, aim, target population, intervention, assessment period, evaluating tools, core childbirth experience concepts and key findings. We extracted this information on Table 1.

As case studies were eligible for inclusion, validity assessment was not applicable in this review. Quality assessment was performed using the Mixed Methods Appraisal Tool (MMAT- Version 18, Hong et al., 2019). The MMAT was developed in 2006 (Pluye et al., 2009) and revised in 2011 (Pace et al., 2012) and 2018 (Hong et al., 2018). It is a critical appraisal tool designed for the appraisal stage of systematic mixed studies reviews and can be used to assess qualitative research, randomized controlled trials, non-randomized studies, quantitative descriptive studies and mixed methods studies (Hong et al., 2018).

Results

After the search string was run on the different databases, we initially retrieved 709 articles. In addition to those, we found nine articles on Google Scholar. After duplicates were removed, 659 articles were screened by titles. Five hundred and seventy seven articles were removed for irrelevance and the remaining 82 were screened by abstracts. At that point, articles about emotional freedom techniques, use of relaxation, complementary and alternative medicine in general, studies using hypnosis for different medical conditions, or during the process of abortions or conceiving, were excluded. Among the 26 articles screened by full-text, nine met the inclusion criteria, three were excluded for referring to the same research protocols, while the remaining 14 were excluded for not measuring women's subjective experience specifically related to childbirth (see Table 2).

Each included article was assessed according to the MMAT tool. A score was assigned based on the number of criteria met (20% for each criterion met and so on until 100% for all five criteria met). Rather than an exclusion based on a lesser overall score, the authors of the MMAT tool (Hong et al., 2018) encourage a sensitivity analysis of every study: as the number of studies included was low, we chose to use the MMAT score as an indication of quality but not as an exclusion criterion, with a specific comment for the MMAT score for every study included (see Table 1). Studies 2 and 4 met all the criteria with a score of 100%. Three studies (1,5,9) scored 80% on the MMAT, two (3,6) scored 60% and two (7,8) scored 40%): There were issues with randomization (7,9), blinding the assessors (1,7), lack of adherence to the assigned interventions (5), very unequal interventions between experimental and control groups (3,9), significant baseline differences between groups (7), problems with substantiating data and making a coherent link between data sources, collection, analysis and interpretation (6), and lack of evidence concerning the interview transcript of outcomes and method of analysis (8).

Table 1
Results.

Study, Authors, Country, Year	Design, MMAT scores and comments	Aim	Target population	Intervention Assessment period	Tools	Core concepts for childbirth experience	Key findings
Study 1 Atis and Rathfisch, 2018 Turkey	Quantitative randomized controlled single-blinded clinical trial MMAT 80% Criterion 2.4 wasn't met: the assessor wasn't blinded to the intervention provided	Identify the effect of hypnobirthing training provided in the pregnancy period on childbirth pain and fear	$N = 60$ Experimental group $N = 30$ Control group $N = 30$ Primipara women	Intervention between 20 and 36 weeks of gestation Weekly 3 h sessions during 4 weeks & videos Prenatal sessions & during labor Pre-natal and postnatal assessment	During pregnancy: Prenatal period information form (PIF) Wijma's Delivery Expectancy Questionnaire W-DEQ-A (fear, confidence and expectations) During delivery: Visual Analog Scale (VAS) After delivery: Wijma's Delivery Experience Questionnaire W-DEQ-B/postnatal assessment form (PAF)	Childbirth fear	For participants from the experimental group: Less pain during labor (latent, active and transition phases) Lower scores in W-DEQ-B: reduction of birth fear Hypnosis "helped relaxation", "gave peace and confidence", "reduced the feeling of pain" and "helped to adjust to the environment" Shorter duration for 2nd and 3rd phase of labor Lower birth difficulty
Study 2 Finlayson et al., 2015 United Kingdom	Qualitative phenomenological study MMAT 100%	Explore the views and experiences of a group of women receiving an antenatal self-hypnosis training program for labor pain relief Study led along a research protocol: the SHIP trial (Downe et al., 2015)	$N = 16$ Women recruited from the experimental arm of the SHIP trial (Downe et al., 2015) Primipara women Partners included	Hypnosis intervention: around 32 weeks and 35 weeks of pregnancy, 2 self-hypnosis sessions × 90 min & CDs Post-partum assessment: 8 to 14 weeks post-partum	Semi-structured one to one qualitative interviews	Childbirth experiences of women having received antenatal self-hypnosis for labor pain and relief	Women reported experiencing: Calmness in a climate of fear Going from skeptic to believer Finding their space (literal and metaphorical sense) Having experienced delays and disappointments (shortcomings in using learnt techniques in a clinical setting) Having personal preferences (development of personal ways of utilizing training resources, such as self-hypnosis CD)
Study 3 Streibert et al., 2015 Germany	Quantitative non-randomized cohort study MMAT 60% Criteria 3.1 for population and 3.2 for measurements weren't met	Investigate the change in outlook towards birth	$N = 213$ Midwife education program $N = 155$ Self-hypnosis training $N = 58$	Above 26 weeks of gestation 10 sessions × 2 h for the midwife education program 4 self-hypnosis sessions × 2 h & CDs for the hypnosis group Assessment before the first and after the last self-hypnosis course	Osgood semantic differential scale questionnaire (−3 to +3 point scale) 4 words: 'birth' 'baby' 'partner' 'hypnosis' 3 attitudes: "good-bad", "strong-weak", "active-passive" Administered before the first and after the last course unit	Outlook towards birth	Positive changes in maternal emotions towards the outlook to birth (pleasure, harmony, dimension evaluation)

(*continued on next page*)

Table 1 (*continued*)

Study, Authors, Country, Year	Design, MMAT scores and comments	Aim	Target population	Intervention Assessment period	Tools	Core concepts for childbirth experience	Key findings
Study 4 Werner et al., 2013a Denmark	Quantitative randomized controlled single-blinded trial MMAT 100%	Develop a brief course in antenatal self-hypnosis to provide women with skills to cope with childbirth and to evaluate the effects on the childbirth experience	$N = 1222$ Intervention group $N = 497$ Active comparison group (relaxation group) $N = 495$ Control group of usual care $N = 230$ Primipara women	Above 27 weeks of gestation 3 × 1 h weekly sessions & audio recordings for both intervention (self-hypnosis) and active comparison (relaxation) group Assessment at recruitment and 6 weeks postpartum	At recruitment: W-DEQ-A/10-item Perceived Stress Scale/WHO-5 well-being questionnaire Immediately after completion of antenatal course: on a 5-point Likert scale (1–2 positive way, 3 no change, 4–5 negative way), question whether their expectations about the upcomping birth had changed 6 weeks post-partum: W-DEQ-B	Development of skills to cope with childbirth and evaluation of childbirth experience	Positive changes in expectations of upcoming birth for the hypnosis group Better childbirth experience for the hypnosis group Lower scores for fear level (for vaginal and spontaneous births)
Study 5 Cyna et al., 2013 Australia	Quantitative randomised controlled three-arm parallel group design clinical trial MMAT 80% Criterion 2.5 for adherence with the assigned intervention wasn't met	Investigation of the impact of standardised group hypnosis training in late pregnancy on analgesia requirements during childbirth	$N = 448$ Hypnosis intervention+ CD group= 154 Only CD group= 143 Control group=151	As near as possible to 37 weeks of gestation Three consecutive weekly group sessions+ CDs of the sessions for hypnosis group Hypnosis sessions on CDs for the CD-only group Usual antenatal preparation for the control group	Demographic data collection/ Spielberger State-Trait Anxiety Inventory/ Edinburgh Postnatal Depression Scale/ Creative Imagination Scale at baseline SSTAI/EPDS/postnatal questionnaire at birth and 6 weeks postpartum	Childbirth experiences of women having received antenatal self-hypnosis for labor pain and relief	No statistically significant between groups difference for: -the use of analgesia during childbirth, mode of delivery, labor length, breastfeeding, maternal pain intensity -birth experience being better than expected or a positive experience, sense of control during labor, ability to cope or satisfaction with the childbirth experience Increased use of prostaglandins for induction in women allocated in the hypnosis group

(*continued on next page*)

Table 1 (*continued*)

Study, Authors, Country, Year	Design, MMAT scores and comments	Aim	Target population	Intervention Assessment period	Tools	Core concepts for childbirth experience	Key findings
Study 6 Abbasi et al., 2009 Iran	Qualitative phenomenological study MMAT 60% Criterion 1.4 for interpretation and 1.5 for coherence weren't met	Understand the critical issues associated with hypnosis as a method of pain relief from the individual's perspective	$N = 6$ At least one birth in the past 4 years	38 to 42 weeks of gestation One self-hypnosis session × 75 min & presence of hypnotherapist during labor Post-partum assessment	In-depth audio-recorded interviews with open-ended questions Within 24 h after birth	Childbirth experiences of women having received antenatal self-hypnosis for labor pain and relief	Increased satisfaction, sense of control and confidence Reduced fear, anxiety and labor pain Decrease in fear of natural childbirth Shorter labor, reduced tiredness and increased consciousness Changing the sense of pain into a sense of pressure No longer willingness to have a selective cesarian operation in the future
Study 7 Guse et al., 2006 South Africa	Quantitative randomized controlled trial MMAT 40% Criteria 2.1 for randomization, 2.2 for significant baseline differences between groups and 2.4 for blinding the assessors weren't met	Develop and evaluate a hypnotherapeutic program based on Ericksonian and ego state therapy principles, with the focus being the promotion of the psychological well-being and strengths of first-time mothers	$N = 46$ Experimental group $N = 23$ Control group $N = 23$ Primipara women	3rd trimester of pregnancy (24 to 38 weeks of gestation) 6 individual sessions for experimental group Pre and post-partum assessment	During the 1st session: Stanford Hypnotic Clinical Scale (SHCS: Adult) Two weeks and two months post-partum: Childbirth Perceptions Questionnaire : Perception of Labor and Delivery (PLD- for psychological well-being related to specific aspects of early motherhood)/Items from research by Woollett and Parr focusing on mothers' feelings about their babies and their relationship with their babies (FRB)/Maternal Self-Confidence Scale (MSC)(subscale of the Childbirth Attitudes Question-naire)/Edinburgh Postnatal Depression Scale (EPDS)/General Health Questionnaire (GHQ)/Satisfaction with Life Scale (SWLS)/Affectometer 2 Short Form (AFM)/Sense of Coherence Scale (SOC)/Generalized Self-Efficacy Scale (GSE)	Promotion of psychological well-being and strengths of 1st time mothers	Significantly higher scores for the experimental group on all measures of psychological well-being except for the PLD & GHQ at two weeks. Continued to exhibit an improvement on their prenatal scores at ten weeks post-partum with regard to their experience of their relationship with their babies, maternal self-confidence, levels of depression, decrease in symptom pathology, increase in life satisfaction, positive affect balance and a strengthened sense of coherence

(*continued on next page*)

Table 1 (*continued*)

Study, Authors, Country, Year	Design, MMAT scores and comments	Aim	Target population	Intervention Assessment period	Tools	Core concepts for childbirth experience	Key findings
Study 8 German, 2004 Australia	Qualitative case study MMAT 40% Criteria 1.3/1.4/1.5 weren't met as there is no evidence of an interview transcript to address the aim of this study	Decrease generalized anxiety, and the frequency and severity of panic attacks Increase confidence by empowering the patient with self-management skills during pregnancy, childbirth, motherhood & beyond, promote self-efficacy and mastery	One primipara patient treated for generalized anxiety and panic attacks during pregnancy Partners included	30 weeks of gestation and beyond 2 self-hypnosis sessions & audio-recorded sessions Pre and post-partum assessment	Post natal interview	Development of skills to cope with childbirth and evaluation of childbirth experience	Patient reported painful contractions during labor, but also having learned how to focus and not to panic during childbirth
Study 9 Mehl-Madrona, 2004 USA	Mixed methods convergent design MMAT 80% Criterion 5.5 for quality of each tradition of methods involved wasn't met	Determine if a program of prenatal hypnosis could reduce birth complications and labor length	$N = 520$ patients Experimental group $N = 260$ Attention-only group $N = 260$ (matched to a No-contact group for comparison) Partners included	During the 1st and 2nd trimester As many sessions as needed for experimental group (1 to 60 sessions were reported) Attention-only (psychotherapy) group: as many sessions as needed Pre and postnatal assessment	Prenatal assessment: Complete medical and psychosocial history, stressors, fears and social support assessed during an initial 2-hour interview/Holmes-Rahe Life Stress Inventory/Taylor Manifest Anxiety Scale/Dyadic Adjustment Scale/Beck Depression Inventory Women's or couples' interviews, encoded according to the Glaser's method of grounded theory postnatal assessment: Case reviews for labor outcomes (normal vs complicated births)	Childbirth fear	Fewer complicated deliveries for the hypnosis group Prenatal hypnosis was able to offset a lack of support form friends and mother (but not from women's partners) The association of anxiety, fear, poor maternal self-identity, negative belief about birth and higher levels of life stress with complicated birth, was eliminated in the hypnosis group

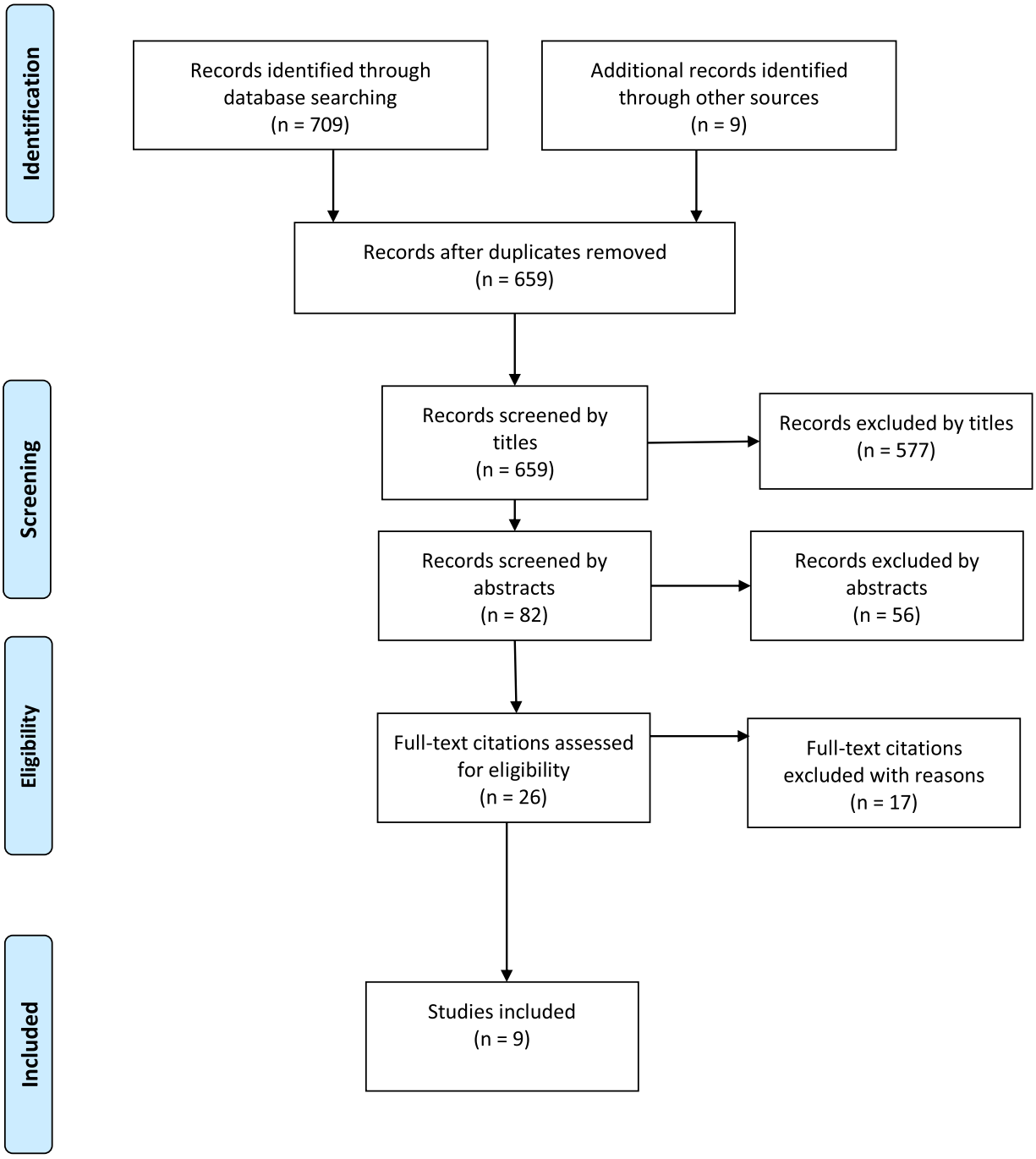

Fig. 1. PRISMA Flow Diagram.

The years ranged from 2004 to 2018 and a total of 2532 women took part in the research protocols. The designs were quantitative for more than half of the studies: Four randomized (1,4,5,7) and one non-randomized cohort study (3). There were two qualitative phenomenological studies (2,6), one case study (8) and one mixed methods convergent study (9). The assessment tools used to evaluate whether the attitudes towards birth or the childbirth experience overall were various: Two studies (1,4) used the Wijma's Delivery Expectations/Experience Questionnaire (W-DEQ-A or W-DEQ-B), one (3) used an Osgood semantic differential scale questionnaire with three attitudes towards four themes (baby, birth, partner and hypnosis). The Perception of Labor and Delivery Scale (PLD) and the Maternal Self-Confidence (MSC, subscale of the Childbirth Attitudes Questionnaire) were used in another study (7). Four research protocols used in-depth interviews to assess attitudes towards birth or experience of childbirth (2, 6, 8, 9), with a thematic analysis for three of them (2, 6, 9), and one study used a postpartum questionnaire with questions about the childbirth experience (5).

The evaluation of the childbirth experience wasn't always a primary goal of the included studies, but was often one of the parameters studied. The aims of the included studies were mainly threefold:

- -Exploration of the outlook towards birth in general (3,5) and more specifically, to understand if hypnosis changed the experience of pain and fear related to childbirth (1,2,4,5,6,8);

Table 2
Excluded papers.

Authors	Study	Reasons for exclusion
Beevi et al., 2019	The effectiveness of hypnosis Intervention in alleviating postpartum psychological symptoms	Measures of depression, anxiety and stress. No measures of subjective experience specifically related to childbirth
Beevi et al., 2017	The effectiveness of hypnosis intervention for labor : an experimental study	Labor and delivery data/visual analog pain scale/ neonatal assessment. No measures of subjective experience specifically related to childbirth
Legrand et al., 2017	Effets of hypnosis during pregnancy : a psychophysiological study on maternal stress	Antenatal measures of stress and anxiety. No measures of subjective experience specifically related to childbirth
Waisblat et al., 2017	Impact of a hypnotically-based intervention on pain and fear in women undergoing labor	Pain and fear measures related only to the placement of the epidural catheter during childbirth
Beevi et al., 2016	Impact of hypnosis intervention in alleviating psychological and physical symptoms during pregnancy	Measures of depression, anxiety and stress. No measures of subjective experience specifically related to childbirth
Beevi et al., 2015	Succesful treatment of ptyalism gravidarum with concomitant hyperemesis using hypnosis	Measures of depression, anxiety and stress, physical symptoms and general emotional state. No measures of subjective experience specifically related to childbirth
Downe et al., 2015	Self-hypnosis for intrapartum pain management (SHIP) in pregnant nulliparous women : a randomised controlled trial of clinical effectiveness	Article referring to the same research protocol as Finlayson et al., 2015, included
Slater, 2015	Post-traumatic stress disorder managed successfully with hypnosis and the rewind technique : two cases in obstetric patients	Measures of experience only in relation to a prior birth experience
Williamson and Gregory, 2015	Hypnotherapy : the salutogenic solution to dealing with phobias	White coat hypertension case report. No measures of subjective experience specifically related to childbirth
Beebe, 2014	Hypnotherapy for labor and birth	Litterature review. Case report. No measures of subjective experience specifically related to childbirth
Werner et al., 2013b	Effect of self-hypnosis on duration of labor and maternal and neonatal outcomes : a randomized controlled trial	Article referring to the same research protocol as Werner et al., 2013a, included
Werner et al., 2012	Self-hypnosis for coping with labor pain : a randomised controlled trial	Article referring to the same research protocol as Werner et al., 2013a, included
Madrid et al., 2011	Treating persistent nausea of pregnancy with hypnosis: four cases	Evaluation related only to nausea and vomiting symptoms
Cyna et al., 2006	Antenatal self-hypnosis for labor and childbirth : a pilot study	Measures of use of epidural analgesia. No measures of subjective experience specifically related to childbirth
Cyna and Andrew, 2003	Induction of labor using switchbox imagery during hypnosis	Case report. No measures of subjective experience specifically related to childbirth
Brown and Massarelli, 2002	Medical hypnosis and quadruplets: a case report	Case report. No measures of subjective experience specifically related to childbirth
Moore and Burrows, 2002	Hypnosis in childbirth	Case report. No measures of subjective experience specifically related to childbirth

- -Promotion of psychological well-being and development of skills to cope with childbirth (4,7,8);
- -To determine if prenatal hypnosis can reduce birth complications (5,9) and labor length (1,5,9).

Key findings

Only one study (Cyna et al., 2013) did not find any statistically significant differences between groups in the use of analgesia, perceived pain, labor length or mode of delivery. This same study found no influence of hypnosis sessions on childbirth satisfaction, sense of control or sense of being able to cope with birth.

All the other included studies found a positive impact of hypnosis-based interventions on several domains:

Labor outcomes: Shorter duration of labor was observed in two studies (Atis and Rathfisch, 2018; Abbasi et al., 2009) and particularly concerning phases 2 and 3 of labor (Atis and Rathfisch, 2018). The association of anxiety, fear, poor maternal self-identity, negative belief about birth and higher levels of life stress with complicated birth was eliminated for the hypnosis group in comparison to control in one study (Mehl-Madrona, 2004). This same study found that women from the hypnosis group had fewer complicated births overall.

Fear and pain related to childbirth: Three studies (Atis and Rathfisch, 2018; Werner et al., 2013a; Abbasi et al., 2009) found that the hypnosis group scored significantly lower pain scores during labor, with a reduction of fear related to birth, as seen through the lower scores on the W-DEQ-B. One study reported a change in the perception of pain, which turned into a sense of pressure rather than a painful sensation, with the use of hypnosis (Abbasi et al., 2009).

Better childbirth experience: The findings suggest better childbirth experience (Werner et al., 2013a), lower birth difficulty experienced overall (Atis and Rathfisch, 2018), and no longer a willingness for a selective caesarean section in the future (Abbasi et al., 2009). Women experienced positive changes in their emotions and

outlook towards birth, expressing feelings of pleasure and harmony (Streibert et al., 2015), less anxiety (Abbasi et al., 2009), and increased satisfaction related to childbirth (Werner et al., 2013a).

Postnatal well-being: One study (Guse et al., 2006) found that the hypnosis group showed a significant improvement of prenatal scores and a continuous improvement ten weeks post-partum in a multitude of measures of psychological well-being, such as maternal self-confidence, increase in life satisfaction, positive affect balance and a strengthened sense of coherence, with significantly less general symptoms of psychopathology and depression.

Empowerment: Women who received hypnosis-based interventions experienced an increased sense of control and confidence in relation to childbirth (Atis and Rathfisch, 2018; Abbasi et al., 2009), reported keeping calmness in a climate of fear, while finding their space (Atis and Rathfisch, 2018; Finlayson et al., 2015) and being able to focus whilst being in pain (German, 2004).

Discussion

It has been debated in some research protocols whether hypnosis-based interventions had an impact on birth outcomes (Werner et al., 2012 and 2013b; Downe et al., 2015). When these same studies focus on the impact of their interventions on childbirth experience, positive results are found (Werner et al., 2013a; Finlayson et al., 2015).

Interestingly, in the only study that did not find any positive effects of hypnosis on the childbirth experience (Cyna et al., 2013), sessions of hypnosis were offered in group settings late in pregnancy (as close to 37 weeks of gestation as possible), and less than 50% of women allocated in the intervention groups actually attended all 3 sessions, and even fewer used the hypnosis compact discs (CDs) as instructed. In order to comprehend this lack of motivation, it would be useful to consider the nature of the relationship established between pregnant women and their hypnotherapists in this protocol, as this relationship is known to be crucial for the success of hypnosis (Bioy and Michaux, 2007).

The results of this review suggest that hypnosis-based interventions on mothers-to-be can positively impact their subjective experience of childbirth. The findings show how women felt less fearful and more confident with themselves and their capacity to go through labor, while enabling them to deal with their emotions in a more satisfactory manner. Another crucial part of the findings is the sense of feeling in control of the situation. This is of great importance considering the preexisting literature that finds control to be one of the main ingredients of a positive childbirth experience (Lavender et al., 1999; Larkin et al., 2009).

Although the findings of this review are encouraging for the use of hypnosis in pregnancy, labor and birth and the improvement of the childbirth experience, there are several limitations that can affect their generalization. Some issues need to be addressed, the first being linked to the design of this review, as it included only articles written in English. Furthermore, the methodological value of the articles was limited for half of the studies. The interventions were at times quite uneven between protocols or even inside a protocol, as the duration and frequency of sessions were not always comparable between groups (see Table 1). The content of the interventions was not consistently specified and this opens a perspective for a future investigation. Nonetheless, even if standardizing the hypnosis interventions is crucial for comparing the different protocols (James, 2008), the difficulty lies in the fact that every woman is unique, as is her past and present physical and emotional experiences.

Very few studies took into consideration *women's partners*. Only in three studies (Finlayson et al., 2015; German, 2004; Mehl-Madrona, 2004) partners were part of the protocols, and there is almost no data of the impact of their participations. Nonetheless, there is some evidence that prenatal hypnosis could balance a lack of social support from friends and mother, but not from the women's partner (Mehl-Madrona, 2004). This could be an interesting issue to be investigated in future hypnosis-based interventions, as the importance of the perceived support from partners has been long known to be crucial for a positive childbirth experience (Beaton and Gupton, 1990; Olde et al., 2006). Including expectant fathers in the hypnosis protocols would also allow them to prepare for the forthcoming birth and alleviate their own potential childbirth fear (Serçekus and Baskale, 2016; Hildingsson et al., 2014).

There is little evidence about *medical and surgical history* of the pregnant women included in the studies. Only two protocols incorporated this information (German, 2004; Mehl-Madrona, 2004). Past experience can be a crucial element in the way one will experience any physical event. For instance, past pain experience may greatly influence the way future painful events will be experienced (Noel et al., 2012). Similarly, there are few data collected concerning *childbirth narratives coming from women's close environments*: recent research has underlined how hearing other's pain appraisals can modulate the anticipation and the experience of one's own pain (Peng et al., 2019). Including these elements in the hypnosis protocols can help women focus on their actual and individual emotional and physical experience of pregnancy, while protecting them from external influences such as negative childbirth narratives or even their own past experiences that can be traumatic (Yildiz et al., 2017). It would also be helpful to take into consideration in the hypnosis protocols the experience of women going through *pregnancy complications*, as several conditions can greatly affect the subjective experience of pregnancy and childbirth (Blazy, 2012).

Finally, an interesting finding is that pregnant women using self-hypnosis at the beginning of their labor could look so relaxed when attending the maternity unit, that the midwives sometimes misinterpreted this relaxed state and sent laboring women home (Finlayson et al., 2015). Hypnosis often naturally leads patients to a more relaxed state, which can affect body movements and facial expressions. These are crucial for the social communication of pain and of our inner state in general, as they provide key information to the observer. People have common representations of the way faces and bodies react to a noxious stimulus, and we perceive others' pain through these representations (Budell et al., 2010; Craig et al., 2009). When these latter do not correspond to what is expected, healthcare-providers tend to underestimate painful complaints (PrKachin et al., 2007). This underlines the need for a wider knowledge and multi-disciplinary staff training among healthcare professionals in order to provide the most beneficial environment for women using self-hypnosis during labor (McAllister et al., 2017; James, 2009).

Conclusions

This review aimed to understand the impact of hypnosis-based interventions on women's childbirth experience. Even though there are several limitations for the generalization of the results, the main findings are encouraging for the use of hypnosis in the improvement of childbirth experience and particularly in alleviating fear and pain related to childbirth, enhancing postnatal well-being, and empowering women to feel more confident and in control of their emotions during childbirth.

This review opens some paths for future research, by exploring how several aspects of individual experience during pregnancy can be taken into account in the design of hypnosis-based protocols, such as the inclusion of women's partners in the hypnosis interventions (during pregnancy and labor), the personal medical and surgical history of women, childbirth narratives coming from

women's close environments, or the impact of experiencing a complex pregnancy. An interesting future review would be an inventory and content analysis of all hypnosis-based interventions that have been published in the perinatal field in order to have a clear perspective of their theoretical bases, designs, goals and specific outcomes.

Authorship

The protocol of this review was developed and its progress was critically appraised by both SC and JW. SC performed the literature search, screening and inclusion phase of the process and wrote the first draft of this article. Both authors participated and approved the final draft.

Ethical approval

Not applicable.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Declaration of Competing Interest

The authors declare no conflict of interest.

Acknowledgements

We would like to thank Dr Dikaios Sakellariou for his feedback.

References

Abbasi, M., Ghazi, F., Barlow-Harrison, A., Sheikhvatan, M., Mohammadyari, F., 2009. The effect of hypnosis on pain relief during labor and childbirth in Iranian pregnant women. Int. J. Clin. Exp. Hypn. 57 (2), 174–183. doi:10.1080/00207140802665435.

Araoz, D., 2005. Defining hypnosis. Am. Soc. Clin. Hypn. 48 (2–3), 123–126. doi:10.1080/00029157.2005.10401506.

Atis, F.Y., Rathfisch, G., 2018. The effect of hypnobirthing training given in the antenatal period on birth pain and fear. Complement. Ther. Clin. Pract. 33, 77–84. doi:10.1016/j.ctcp.2018.08.004.

Ayers, S., Eagle, A., Waring, H., 2006. The effects of childbirth-related post-traumatic stress disorder on women and their relationships: a qualitative study. Psychol. Health Med. 11 (4), 389–398. doi:10.1080/13548500600708409.

Barker, J., Jones, M., Greenlees, I., 2010. Assessing the immediate and maintained effects of hypnosis on self-efficacy and soccer wall-volley performance. J. Sport Exerc. Psychol. 32 (2), 243–252. doi:10.1123/jsep.32.2.243.

Beaton, J., Gupton, A., 1990. Childbirth expectations: a qualitative analysis. Midwifery 6 (3), 133–139. doi:10.1016/S0266-6138(05)80170-6.

Becker, P.M., 2015. Hypnosis in the management of sleep disorders. Sleep Med. Clin. 10 (1), 85–92. doi:10.1016/j.jsmc.2014.11.003.

Beebe, K.R., 2014. Hypnotherapy for labor and birth. Nurs. Women's Health 18 (1), 48–59. doi:10.1111/1751-486X.12093.

Beevi, Z., Low, W.Y., Hassan, J., 2019. The effectiveness of hypnosis intervention in alleviating postpartum psychological symptoms. Am. J. Clin. Hypn. 61 (4), 409–425. doi:10.1080/00029157.2018.1538870.

Beevi, Z., Low, W.Y., Hassan, J., 2017. The effectiveness of hypnosis intervention for labor: an experimental study. Am. J. Clin. Hypn. 60, 172–191. doi:10.1080/00029157.2017.1280659.

Beevi, Z., Low, W.Y., Hassan, J., 2016. Impact of hypnosis intervention in alleviating psychological and physical symptoms during pregnancy. Am. J. Clin. Hypn. 58 (4), 368–382. doi:10.1080/00029157.2015.1063476.

Beevi, Z., Low, W.Y., Hassan, J., 2015. Successful treatment of ptyalism gravidarum with concomitant hyperemesis using hypnosis. Am. J. Clin. Hypn. 58, 215–223. doi:10.1080/00029157.2015.1013186.

Bioy, A., Michaux, D., 2007. Traité d'hypnothérapie. Dunod, Paris. pp. 9–18.

Blazy, M., 2012. Les grossesses à risque. In: Missonnier, S. (Ed.), Manuel De Psychologie Clinique De La Périnatalité. Elsevier Masson, Paris, pp. 65–102. doi:10.1016/B978-2-294-70541-0.00005-6.

Bossano, C.M., Townsend, K.M., Walton, A.C., Blomquist, J.L., Handa, V.L., 2017. The maternal childbirth experience more than a decade after delivery. Am. J. Obstet. Gynecol. 217 (3) 342e1-342e8. 10.1016/j.ajog.2017.04.027.

Breda, J., Lehmann Schumann, N., Arshad, S., 2015. Body image and pregnancy. birth in Europe in the 21st century. WHO Eur. Region. Entre Nous 81, 24–25. http://www.euro.who.int/__data/assets/pdf_file/0003/277734/Body-image-and-pregnancy.pdf?ua=1.

Brown, D., Massarelli, E., 2002. Medical hypnosis and quadruplets : a case report. Am. J. Clin. Hypn. 45 (1), 39–46. doi:10.1080/00029157.2002.10403496.

Brown, A., Rance, J., Warren, L., 2015. Body image concerns during pregnancy are associated with a shorter breast feeding duration. Midwifery 31 (1), 80–89. doi:10.1016/j.midw.2014.06.003.

Budell, L., Jackson, P., Rainville, P., 2010. Brain responses to facial expressions of pain: emotional or motor mirroring? Neuroimage 53, 355–363. doi:10.1016/j.neuroimage.2010.05.037.

Bydlowski, M., 2001. Le regard intérieur de la femme enceinte, transparence psychique et représentation de l'objet interne. Devenir 13 (2), 41–52. doi:10.3917/dev.012.0041.

Carquillat, P., Boulvain, M., Guittier, M.-J., 2016. How does delivery method influence factors that contribute to women's childbirth experiences? Midwifery 43, 21–28. doi:10.1016/j.midw.2016.10.002.

Cowen, L.W., 2016. Literature review into the effectiveness of hypnotherapy. ACR J. 10 (1), 1–55. http://www.acrjournal.com.au/resources/assets/journals/Volume-10-Issue-1-2016/V10_I1_Leon_Cowen_1-55.pdf.

Christian, L., 2012. Psychoneuroimmunology in pregnancy: immune pathways linking stress with maternal health, adverse birth outcomes, and fetal development. Neurosci. Biobehav. Rev. 36 (1), 350–361. doi:10.1016/j.neubiorev.2011.07.005.

Craig, K.D., Versloot, J., Goubert, L., Vervoort, T., Crombez, G., 2009. Perceiving pain in others: automatic and controlled mechanisms. J. Pain 11 (2), 101–108. doi:10.1016/j.jpain.2009.08.008.

Cyna, A.M., Andrew, M.I., 2003. Induction of labour using switchbox imagery during hypnosis. Aust. J. Clin. Exp. Hypn. 31 (1), 74–87.

Cyna, A.M., McAuliffe, G.L., Andrew, M.I., 2004. Hypnosis for pain relief in labour and childbirth: a systematic review. Br. J. Anaesth. 93 (4), 505–511. doi:10.1093/bja/aeh225.

Cyna, A.M., Andrew, M.I., McAuliffe, G.L., 2006. Antenatal self-hypnosis for labour and childbirth : a pilot study. Anaesth. Intensive Care 34, 464–469. doi:10.1177/0310057X0603400402.

Cyna, A.M., Crowther, C.A., Robinson, J.S., Andrew, M.I., Antoniou, G., Baghurst, P., 2013. Hypnosis antenatal training for childbirth: a randomised controlled trial. BJOG 120, 1248–1259. doi:10.1111/1471-0528.12320.

Dahlberg, U., Aune, I., 2013. The woman's birth experience—The effect of interpersonal relationships and continuity of care. Midwifery 29 (4), 407–415. doi:10.1016/j.midw.2012.09.006.

Davidson, J.A., 1962. An assessment of the value of hypnosis in pregnancy and labour. Br. Med. J. 2, 951–953. doi:10.1136/bmj.2.5310.951.

Dobbin, A., Maxwell, M., Elton, R., 2009. A benchmarked feasibility study of a self-hypnosis treatment for depression in primary care. Int. J. Clin. Exp. Hypn. 57 (3), 299–318. doi:10.1080/00207140902881221.

Dominguez-Ortega, L., Rodriguez-Munoz, S., 2010. The effectiveness of clinical hypnosis in the digestive endoscopy: a multiple case report. Am. J. Clin. Hypn. 53 (2), 101–107. doi:10.1080/00029157.2010.10404332.

Downe, S., Finlayson, K., Melvin, C., Spiby, H., Ali, S., Diggle, P., Gyte, G., Hinder, S., Miller, V., Slade, P., Trepel, D., Weeks, A., Whorwell, P., Williamson, M., 2015. Self-hypnosis for intrapartum pain management in pregnant nulliparous women: a randomised controlled trial of clinical effectiveness. Br. J. Obstet. Gynaecol. 122 (9), 1226–1234. doi:10.1111/1471-0528.13433.

Finlayson, K., Downe, S., Hinder, S., Carr, H., Spiby, H., Whorwell, P., 2015. Unexpected consequences: women's experiences of a self-hypnosis intervention to help with pain relief during labour. BMC Pregnancy Childbirth 15, 1–9. doi:10.1186/s12884-015-0659-0, 229.

Gandhi, B., Oakley, D.A., 2005. Does 'hypnosis' by any other name smell as sweet? The efficacy of 'hypnotic' inductions depends on the label 'hypnosis'. Conscious. Cogn. 14 (2), 304–315. doi:10.1016/j.concog.2004.12.004.

Gartus-Niegel, S., von Soest, T., Vollrath, M.E., Eberhard-Gran, M., 2013. The impact of subjective birth experiences on post-traumatic stress symptoms: a longitudinal study. Arch. Women's Ment. Health 16 (1), 1–10. doi:10.1007/s00737-012-0301-3.

German, E., 2004. Hypnotic preparation of a mother-to-be. Austr. J. Clin. Exp. Hypn. 32 (2), 157–169. http://www.hypnosisaustralia.org.au/resources/journal-archives-public/.

Gooley, J.J., Mohapatra, L., Chao Kuan Twan, D., 2018. The role of sleep duration and sleep disordered breathing in gestational diabetes mellitus. Neurobiol. Sleep Circadian Rythms 4, 34–43. doi:10.1016/j.nbscr.2017.11.001.

Graus, A., 2014. Hypnosis in Spain (1888–1905): from spectacle to medical treatment of mediumship. Stud. Hist. Philos. Biol. Biomed. Sci. 48, 85–93. doi:10.1016/j.shpsc.2014.07.002.

Green, J.P., Barabasz, A.F., Barrett, D., Montgomery, G.H., 2005. Forging ahead: the 2003 apa division 30 definition of hypnosis. Int. J. Clin. Exp. Hypn. 53 (3), 259–264. doi:10.1080/00207140590961321.

Guse, T., Wissing, M., Hartman, W., 2006. The effect of a prenatal hypnotherapeutic programme on postnatal maternal psychological well-being. J. Reprod. Infant. Psychol. 24 (2), 163–177. doi:10.1080/02646830600644070.

Hammond, D.C., 2010. Hypnosis in the treatment of anxiety and stress-related disorders. Expert Rev. Neurother. 10 (2), 263–273. doi:10.1586/ern.09.140.

Hildingsson, I., Haines, H., Johansson, M., Rubertsson, C., Fenwick, 2014. Childbirth fear in Swedish fathers is associated with parental stress as well as poor physical and mental health. Midwifery 30 (2), 248–254. doi:10.1016/j.midw.2013.12.012.

Hodnett, E.D., 2002. Pain and women's satisfaction with the experience of childbirth: a systematic review. Am. J. Obstet. Gynecol. 186 (5), 160–172. doi:10.1016/S0002-9378(02)70189-0.

Hong, Q.N., Pluye, P., Fàbregues, S., Bartlett, G., Boardman, F., Cargo, M., Dagenais, P., Gagnon, M.-P., Griffiths, F., Nicolau, B., O'Cathain, A., Rousseau, M.-C., Vedel, I., 2019. Improving the content validity of the mixed methods appraisal tool (MMAT): a modified e-Delphi study. J. Clin. Epidemiol. 111, 49–59. doi:10.1016/j.jclinepi.2019.03.008.

Hong Q.N., Pluye P., Fàbregues S., Bartlett G., Boardman F., Cargo M., Dagenais P., Gagnon M.-P., Griffiths F., Nicolau B., O'Cathain A., Rousseau M.-C., Vedel I. Mixed Methods Appraisal Tool (MMAT), version 2018. Registration of Copyright (#1148552), Canadian Intellectual Property Office, Industry Canada. http://mixedmethodsappraisaltoolpublic.pbworks.com/w/file/fetch/127916259/MMAT_2018_criteria-manual_2018-08-01_ENG.pdf.

Huang, X., Lin, J., Demner-Fushman, D., 2006. Evaluation of Pico as a knowledge representation for clinical questions. AMIA Annu Symp Proc. 2006, 359–363. http://users.umiacs.umd.edu/~jimmylin/publications/Huang_etal_AMIA2006.pdf.

James, U., 2008. Research into clinical hypnosis: time to grasp the nettle: a commentary on: the launch of the medical school hypnosis association. Complement. Ther. Clin. Pract. 14 (4), 288–290. doi:10.1016/j.ctcp.2008.07.003.

James, U., 2009. Practical uses of clinical hypnosis in enhancing fertility, healthy pregnancy and childbirth. Complement. Ther. Clin. Pract. 15 (4), 239–241. doi:10.1016/j.ctcp.2009.09.005.

Kraft, T., Kraft, D., 2009. The place of hypnosis in psychiatry, part. 3: the application of the treatment to eating disorders. Austr. J. Clin. Exp. Hypn. 37 (1), 1–20. http://www.hypnosisaustralia.org.au/wp-content/uploads/journal/AJCEH_Vol37_No1_MAY09.pdf.

Landolt, A.S., Milling, L.S., 2011. The efficacy of hypnosis as an intervention for labor and delivery pain: a comprehensive methodological review. Clin. Psychol. Rev. 31 (6), 1022–1031. doi:10.1016/j.cpr.2011.06.002.

Larkin, P., Begley, C.M., Devane, D., 2012. 'Not enough people to look after you': an exploration of women's experiences of childbirth in the Republic of Ireland. Midwifery 28 (1), 98–105. doi:10.1016/j.midw.2010.11.007.

Larkin, P., Begley, C.M., Devane, D., 2009. Women's experiences of labor and birth: an evolutionary concept analysis. Midwifery 25 (2), e49–e59. doi:10.1016/j.midw.2007.07.010.

Lavender, T., Walkinshaw, S.A., Walton, I., 1999. A prospective study of women's views of factors contributing to a positive birth experience. Midwifery 15 (1), 40–46. doi:10.1016/S0266-6138(99)90036-0.

Legrand, F., Grévin-Laroche, C., Josse, E., Polidori, G., Quinart, H., Taïar, R., 2017. Effets of hypnosis during pregnancy : a psychophysiological study on maternal stress. Med. Hypotheses 102, 123–127. doi:10.1016/j.mehy.2017.03.026.

Lundgren, I., 2005. Swedish women's experience of childbirth 2 years after birth. Midwifery 21 (4), 346–354. doi:10.1016/j.midw.2005.01.001.

MacKinnon, A.L., Yang, L., Feeley, N., Gold, I., Hayton, B., Zelkowitz, P., 2017. Birth setting, labour experience, and postpartum psychological distress. Midwifery 50, 110–116. doi:10.1016/j.midw.2017.03.023.

Madden, K., Middleton, P., Cyna, A.M., Matthewson, M., Jones, L., 2016. Hypnosis for pain management during labour and childbirth (Review). Cochrane Database Syst. Rev. 2016 5. doi:10.1002/14651858.CD009356.pub3.

Madrid, A., Giovannoli, R., Wolfe, M., 2011. Treating persistent nausea of pregnancy with hypnosis : four cases. Am. J. Clin. Hypn. 54 (2), 107–115. doi:10.1080/00029157.2011.605480.

Marc, I., Rainville, P., Masse, B., Dufresne, A., Verreault, R., Vaillancourt, L., Dodin, S., 2009. Women's views regarding hypnosis for the control of surgical pain in the context of a randomized clinical trial. J. Women's Health 18 (9), 1441–1447. doi:10.1089/jwh.2008.1015.

Marc, I., Toureche, N., Ernst, E., Hodnett, E.D., Blanchet, C., Dodin, S., Njoya, M.M., 2011. Mind-body interventions during pregnancy for preventing or treating women's anxiety (Review). Cochrane Database of Syst. Rev. 2011 7. doi:10.1002/14651858.CD007559.pub2.

McAllister, S., Coxon, K., Murrells, T., Sandall, J., 2017. Healthcare professionals' attitudes, knowledge and self-efficacy levels regarding the use of self-hypnosis in childbirth: a prospective questionnaire survey. Midwifery 47, 8–14. doi:10.1016/j.midw.2017.01.017.

McCormack, D., 2010. Hypnosis for hyperemesis gravidarum. J. Obstet. Gynaecol. (Lahore) 30 (7), 647–653. doi:10.3109/01443615.2010.509825.

Mehl-Madrona, L.E., 2004. Hypnosis to facilitate uncomplicated birth. Am. J. Clin. Hypn. 46 (4), 299–312. doi:10.1080/00029157.2004.10403614.

Mitchell, M., 2016. Women's use of complementary and alternative medicine in pregnancy: narratives of transformation. Complement. Ther. Clin. Pract. 23, 88–93. doi:10.1016/j.ctcp.2015.05.006.

Moghaddam Hosseini, V.M., Nazarzadeh, M., Jahanfar, S., 2018. Interventions for reducing fear of childbirth: a systematic review and meta-analysis of clinical trials. Women Birth 31 (4), 254–262. doi:10.1016/j.wombi.2017.10.007.

Moher, D., Liberati, A., Telzlaff, J., Altman, D., 2009. Preferred reporting items for systematic reviews and meta-analyses: the prisma statement. Ann. Intern. Med. 151 (4), 264–269. doi:10.1371/journal.pmed.1000097.

Mongan, M.F., 2016. HypnoBirthing®: The Mongan method: the Natural Instinctive Approach to safer, easier, More Comfortable Birthing, 4 ed. Health Communications, Inc., Florida.

Moore, K., Burrows, G., 2002. Hypnosis in childbirth. Austr. J. Clin. Exp. Hypn. 30 (1), 35–44.

Murray, L., Cooper, P., Hipwell, A., 2003. Mental health of parents caring for infants. Arch. Women's Ment. Health 6 (2), 71–77. doi:10.1007/s00737-003-0007-7.

Nishi, D., Shirakawa, M.N., Ota, E., Hanada, N., Mori, R., 2014. Hypnosis for induction of labour. Cochrane Database Syst. Rev. 2014, Issue 8. Art. No.: CD010852. 10.1002/14651858.CD010852.pub2

Noel, M., Chambers, C.T., McGrath, P.J., Klein, R.M., Stewart, S.H., 2012. The influence of children's pain memories on subsequent pain experience. Pain 153 (8), 1563–1572. doi:10.1016/j.pain.2012.02.020.

Olde, E., van der Hart, O., Kleber, R., van Son, M., 2006. Posttraumatic stress following childbirth: a review. Clin. Psychol. Rev. 26, 1–16. doi:10.1016/j.cpr.2005.07.002.

Oyiengo, D., Louis, M., Hott, B., Bourjeily, G., 2014. Sleep disorders in pregnancy. Clin. Chest Med. 35 (3), 571–587. doi:10.1016/j.ccm.2014.06.012.

Pace, R., Pluye, P., Bartlett, G., Macaulay, A.C., Salsberg, J., Jagosh, J., Seller, R., 2012. Testing the reliability and efficiency of the pilot mixed methods appraisal tool (MMAT) for systematic mixed studies review. Int. J. Nurs. Stud. 49 (1), 47–53. doi:10.1016/j.ijnurstu.2011.07.002.

Peng, W., Peng, H., Lu, J., Fan, B., Cui, F., 2019. Others' pain appraisals modulate the anticipation and experience of subsequent pain. Neuroscience 410, 16–28. doi:10.1016/j.neuroscience.2019.04.055.

Pluye, P., Gagnon, M.P., Griffiths, F., Johnson-Lafleur, J., 2009. A scoring system for appraising mixed methods research, and concomitantly appraising qualitative, quantitative and mixed methods primary studies in mixed studies reviews. Int. J. Nurs. Stud. 46 (4), 529–546. doi:10.1016/j.ijnurstu.2009.01.009.

PrKachin, K., Solomon, P., Ross, R., 2007. Underestimation of pain by health-care providers: towards a model of the process of inferring pain in others. Can. J. Nurs. Res. 39 (2), 88–106. https://cjnr.archive.mcgill.ca/article/view/2054.

Richardson, J., Smith, J.E., McCall, G., Richardson, A., Pilkington, K., Kirsch, I., 2007. Hypnosis for nausea and vomiting in cancer chemotherapy: a systematic review of the research evidence. Eur. J. Cancer Care (Engl) 16 (5), 402–412. doi:10.1111/j.1365-2354.2006.00736.x.

Robertson Blackmore, E., Gustafsson, H., Gilchrist, M., Wyman, C., O'Connor, T.G., 2016. Pregnancy-related anxiety: evidence of distinct clinical significance from a prospective longitudinal study. J. Affect. Disord. 197, 251–258. doi:10.1016/j.jad.2016.03.008.

Sado, M., Ota, E., Stickley, A., Mori, R., 2012. Hypnosis during pregnancy, childbirth, and the postnatal period for preventing postnatal depression (Review). Cochrane Database Syst Rev 2012 6. doi:10.1002/14651858.CD009062.pub2.

Salmon, P., Drew, N.C., 1992. Multidimensional assessment of women's experience of childbirth: relationship to obstetric procedure, antenatal preparation and obstetric history. J. Psychosom. Res. 36 (4), 317–327. doi:10.1016/0022-3999(92)90068-D.

Sapp, M., Obiakor, F.E., Scholze, S., Gregas, A.J., 2007. Confidence intervals and hypnosis in the treatment of obesity. Austr. J. Clin. Hypnother. Hypn. 28 (2), 125–133.

Saxbe, D., Rossin-Slater, M., Goldenberg, D., 2018. The transition to parenthood as a critical window for adult health. Am. Psychol. 73 (9), 1190–1200. https://psycnet.apa.org/record/2018-62311-022.

Schnur, J.B., Kafer, I., Marcus, C., Montgomery, G.H., 2008. Hypnosis to manage distress related to medical procedures: a meta-analysis. Contemp. Hypn. 25 (3/4), 114–128. doi:10.1002/ch.364.

Serçekus, P., Baskale, H., 2016. Effects of antenatal education on fear of childbirth, maternal self-efficacy and parental attachment. Midwifery 34, 166–172. doi:10.1016/j.midw.2015.11.016.

Shih, M., Yang, Y.H., Koo, M., 2009. A meta-analysis of hypnosis in the treatment of depressive symptoms: a brief communication. Int. J. Clin. Exp. Hypn. 57 (4), 431–442. doi:10.1080/00207140903099039.

Slater, P.M., 2015. Post-traumatic stress disorder managed successfully with hypnosis and the rewind technique : two cases in obstetric patients. Int. J. Obstet. Anesth. 24, 272–283. doi:10.1016/j.ijoa.2015.03.003.

Smarandache, A., Kim, T.H.M., Bohr, Y., Tamim, H., 2016. Predictors of a negative labour and birth experience based on a national survey of Canadian women. BMC Pregnancy Childbirth 1- (114), 1–9. doi:10.1186/s12884-016-0903-2.

Spiegel, H., Greenleaf, M., 2005. Commentary: defining hypnosis. Am. Soc. Clin. Hypn. 48 (2–3), 111–116. doi:10.1080/00029157.2005.10401504.

Streibert, L.A., Reinhard, J., Yuan, J., Schiermeier, S., Louwen, F., 2015. Clinical study: change in outlook towards birth after a midwife led antenatal education programme versus hypnoreflexogenous self-hypnosis training for childbirth. Geburtshilfe Frauenheilkd 75 (11), 1161–1166. doi:10.1055/s-0035-1558250.

Thompson, T., Terhune, D.B., Oram, C., Sharangparni, J., Rouf, R., Solmi, M., Veronese, N., Stubbs, B., 2019. The effectiveness of hypnosis for pain relief: a systematic review and metaanalysis of 85 controlled experimental trials. Neurosci. Biobehav. Rev. 99, 298–310. doi:10.1016/j.neubiorev.2019.02.013.

Urech, C., Fink, N.S., Hoesli, I., Wilhelm, F.H., Bitzer, J., Alder, J., 2010. Effects of relaxation on psychobiological wellbeing during pregnancy: a randomized controlled trial. Psychoneuroendocrinology 35 (9), 1348–1355. doi:10.1016/j.psyneuen.2010.03.008.

Waisblat, V., Langholz, B., Bernard, F.J., Arnould, M., Benassi, A., Ginsbourger, F., Guillou, N., Hamelin, K., Houssel, P., Hugot, P., Martel-Jacob, S., Moufouki, M., Muselec, H., Mansour, S.N., Ogagna, D., Paqueron, X., Zerguine, S., Cavagna, P., Bloc, S., Jensen, M.P., Dhonneur, G., 2017. Impact of a hypnotically-based intervention on pain and fear, in women undergoing labor. Int. J. Clin. Exp. Hypn. 65 (1), 64–85. doi:10.1080/00207144.2017.1246876.

Wark, D.M., 2008. What we can do with hypnosis: a brief note. Am. J. Clin. Hypn. 51 (1), 29–36. doi:10.1080/00029157.2008.10401640.

Watson, B., Broadbent, J., Skouteris, H., Fuller-Tyszkiewicz, M., 2016. A qualitative exploration of body image experiences of women progressing through pregnancy. Women Birth 29 (1), 72–79. doi:10.1016/j.wombi.2015.08.007.

Werner, A., Uldbjerg, N., Zachariae, R., Wu, C.S., Nohr, E.A., 2013a. Antenatal hypnosis training and childbirth experience: a randomized controlled trial. Birth 40 (4), 272–280. doi:10.1111/birt.12071.

Werner, A., Uldbjerg, N., Zachariae, R., Nohr, E.A., 2013b. Effect of self-hypnosis on duration of labor and maternal and neonatal outcomes: a randomized controlled trial. Acta. Obstet. Gynecol. Scand. 92 (7), 816–823. doi:10.1111/aogs.12141.

Werner, A., Uldbjerg, N., Zachariae, R., Rosen, G., Nohr, E.A., 2012. Self-hypnosis for coping with labour pain: a randomised controlled trial. Br. J. Obstet. Gynecol. 120 (3), 346–353. doi:10.1111/1471-0528.12087.

Werner, W.E.F., Schauble, P.G., Knudsen, M.S., 1982. An argument for the revival of hypnosis in obstetrics. Am. J. Clin. Hypn. 24 (3), 149–171. doi:10.1080/00029157.1982.10404046.

Williamson, M., Gregory, C., 2015. Hypnotherapy : the salutogenic solution to dealing with phobias. Pract Midwife 18 (5), 35–37.

Wolberg, L.R., 1964. Hypnosis in medicine. Bull. NY Acad. Med. 40 (2), 98–115. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1750511/pdf/bullnyacadmed00287-0011.pdf.

Woods, S.M., Melville, J.L., Guo, Y., Fan, M.-Y., Gavin, A., 2010. Psychosocial stress during pregnancy. Am. J. Obstet. Gynecol. 202 (1), 61e1–61e7. doi:10.1016/j.ajog.2009.07.041.

Yeh, V.M., Schnur, J.B., Montgomery, G.H., 2014. Disseminating hypnosis to health care settings: applying the re-aim framework. Psychol. Conscious. 1 (2), 213–228. https://psycnet.apa.org/doi/10.1037/cns0000012.

Yildiz, P.D., Ayers, S., Phillips, L., 2017. The prevalence of posttraumatic stress disorder in pregnancy and after birth: a systematic review and meta-analysis. J. Affect. Disord. 208, 634–645. doi:10.1016/j.jad.2016.10.009.