

# Relationship between Hypnosis for Pain Management in Labor and Adverse Neonatal Outcomes: A Systematic Review

Majid Khadem-Rezaiyan<sup>1</sup>, Reza Saeidi<sup>2</sup>, Masumeh Ghazanfarpour<sup>3</sup>, Mohamadghasem Etemadi Mashhadi<sup>4</sup>, Mona Najaf Najafi<sup>5\*</sup>

1. Community Medicine Specialist, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran

2. Neonatal Research Center, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran

3. Razi School of Nursing and Midwifery, Kerman University of Medical Science, Kerman, Iran

4. Anesthesiologist, Cardiac Anesthesia Research Center, Mashhad University of Medical Sciences, Mashhad, Iran

5. Clinical Research Unit, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran

## ABSTRACT

**Background:** Many techniques have been proposed to relieve labor pain, one of which is hypnotherapy, which can be defined as the usage of hypnosis during labor to alleviate pain or anxiety. The aim of this systematic review was to examine the possible relationship between hypnosis and neonatal outcomes based on the available reports.

**Methods:** Major databases, including PubMed, Web of Science, Scopus, and Cochrane CENTRAL, were systematically searched up to February 6, 2018. In the next stage, the titles and abstracts of the retrieved articles were reviewed to identify the relevant studies. The quality of the studies was evaluated using the Jadad scale. Study appraisal and data extraction were carried out by one of the authors, and then double-checked by another researcher. Finally, the search process resulted in the inclusion of 10 trials.

**Results:** Based on eight studies, hypnosis for pain management during labor had no effect on Apgar score in neonates. No significant difference was reported between hypnosis and non-hypnosis groups in terms of the number of admission to the Neonatal Intensive Care Unit (NICU). Furthermore, the short-term effect of hypnosis on the continuation of exclusive breastfeeding was indicated in three studies. However, the duration of neonatal admission to nursery or NICU was not reported in any of the studies. Only one study reported that there was no significant difference between hypnosis and control groups concerning the frequency of hospital readmission.

**Conclusion:** Based on the evidence reported in the literature, it could be concluded that hypnosis can be regarded as a safe approach for pain management during the labor. Moreover, this intervention did not show to exert any adverse effects on neonatal health status.

**Keywords:** Apgar score, Hypnosis, Labor pain, Neonatal outcome

## Introduction

Labor pain is regarded as one of the most excruciating events that a human being may experience. However, it differs from a woman to another; therefore, it is hypothesized that the pain intensity is affected by many factors. Many techniques have been proposed to control or relieve labor pain and reduce the use of sedatives and analgesics (1, 2).

Hypnotherapy can be defined as the usage of hypnosis during labor to alleviate pain or anxiety (3). The focus of hypnosis is usually on relaxation

and breathing techniques, enhancement of muscle relaxation, as well as reduction of psychological and physical symptoms (4). It has been shown that intraoperative and postoperative hypnotherapy can decrease the operation time (5, 6).

Clinical hypnosis, which focuses on breathing and relaxation, has been used for pain relief during childbirth for more than a century (7, 8). A notable number of studies have reported the positive labor outcomes of this practice. Some of

\* Corresponding author: Mona Najaf Najafi, Clinical Research Unit, Faculty of Medicine, Mashhad University of Medical Sciences, Mashhad, Iran. Tel: +989155009512; Email: Najafnm@mums.ac.ir

Please cite this paper as:

Khadem-Rezaiyan M, Saeidi R, Ghazanfarpour M, Etemadi Mashhadi M, Najaf Najafi M. Relationship between Hypnosis for Pain Management in Labor and Adverse Neonatal Outcomes: A Systematic Review. Iranian Journal of Neonatology. 2018 Sep; 9(3). DOI: [10.22038/ijn.2018.30047.1407](https://doi.org/10.22038/ijn.2018.30047.1407)

these outcomes include reduction in the duration of both the 1<sup>st</sup> and 2<sup>nd</sup> stages of labor, decreased caesarean sections (i.e., increased rate of vaginal birth), use of oxytocic labor augmentation, neonatal resuscitations, epidural administrations, episiotomy rates, and finally analgesia (7, 9-12).

However, the neonatal outcomes have not been thoroughly studied in this regard. One study reported positive neonatal outcomes following the use of hypnosis during labor, such as full-term birth and birth weight of > 2 kg (13). As stated earlier, though maternal outcomes are well studied, little attention has been paid to neonatal outcomes in this respect. With this background in mind, the current systematic review was conducted to investigate the possible relationship between hypnosis and neonatal outcomes based on the already published findings.

## Methods

Major databases, including PubMed, Web of Science, Scopus, and Cochrane CENTRAL, were systematically searched up to February 6, 2018. All controlled clinical trials investigating hypnosis as a method of labor pain management and its associated neonatal outcomes were included in the review.

### Inclusion criteria

Studies with the following criteria were included in this systematic review:

1. Clinical trials (with or without a control group) using hypnosis as a labor pain management approach
2. Notification of all methods of hypnosis
3. Use of hypnosis for pain management in a term pregnancy
4. Investigation of neonatal outcomes

### Exclusion criteria

Animal studies and non-English papers were excluded from the review process.

### Outcome measures

Outcome measures included neonatal outcomes, such as fetal distress, Apgar score, NICU admission, breastfeeding, and long-term outcomes during infancy.

### Search strategy

To find the relevant articles, two authors searched the articles published between January 1, 1980 and February 6, 2018 in several scientific databases, namely PubMed, Web of Science, Scopus, and Cochrane CENTRAL. The search

process was accomplished using the following keywords: "Complementary therapies" OR "Complementary medicine" OR "Alternative treatments" OR "Hypnosis" AND "Labor pain" OR "Obstetric" OR "Delivery" OR "Labor". The titles and abstracts of the retrieved articles were reviewed to identify the relevant studies. Additionally, following the exclusion of the irrelevant papers, the references of the selected articles (i.e., 10 studies) and citation searching were also considered.

### Study appraisal and data extraction

The quality of the studies was evaluated using the Jadad scale. In addition, a checklist was used to evaluate five properties of each study, including randomization, method of randomization, blinding, method of blinding, and cause of attrition. The homogeneity of groups and intention to treat analysis were also assessed. The appraisal of the papers and data extraction were carried out by one of the authors, and then double-checked by another one. The papers that did not have the standard quality were further discussed and decided upon by two researchers.

A table was prepared for summarizing the studies features, including the first author's name, time and design of study, intervention and control groups, and neonatal outcomes (e.g., fetal distress, Apgar score, NICU admission, breastfeeding, and long-term outcomes). Finally, the data were reported using a qualitative approach.

## Result

Figure1 displays a flow chart describing the searching process of this systematic review. A total of 1,490 papers were retrieved in the initial literature review. The exclusion of the duplicates resulted in a total of 1,131 papers. The review of the titles and abstracts of the articles led to the removal of 1,107 articles. Out of the remaining studies, 14 articles were excluded due to not dealing with infancy outcomes (n=10), only reporting fetal outcomes (n=1), unavailability of the full text (n=1), having a retrospective design (n=1), or only discussing abortion cases (n=1). Finally, a total of 10 trials were included in the qualitative systematic review.

### Risk of bias in included studies

Among the 10 eligible articles, 2, and 6 cases were quasi-experimental, non-randomized trials, and randomized controlled trials, respectively. Only in 3 cases out of 6 trials, the method of generating allocation sequence had been

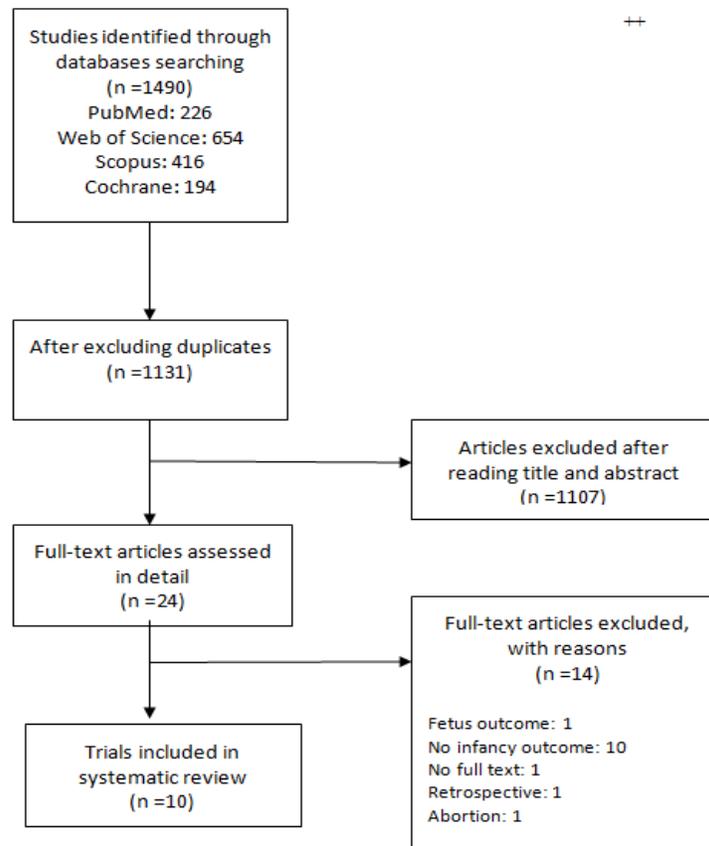


Figure 1. Flow chart of the systematic literature review process

Table 1. Quality evaluation of the reviewed studies using Jadad scale

Author	Randomization			Blinding			Sample
	Mentioning randomization	Appropriate method	Inappropriate method	Mentioning blinding	Appropriate method	Inappropriate method	Report of dropping out
Beevi	Non-random	-	-	?	-	-	+
Werner	+	+	-	+	+	-	+
Cyna	+	+	-	+	+	-	+
Fisher	+	?	-	+	+	-	+
Abbasi	Quasi-experimental	-	-	-	-	-	+
Mehl-Madrona	+	+	-	+	+	-	+
Martin	+	-	-	+	+	-	+
Letts	Quasi-experimental	-	-	+	+	-	+
Harmon	+	?	-	+	+	-	+
Brann	Non-random	-	-	-	-	-	+

reported. Seven of the reviewed studies used single blind technique following an appropriate method. One of them was open-label and two cases did not report blinding. Attrition was not reported in two trials. There was a baseline comparability in all of these studies. Intention to treat analysis was reported only in 3 out of 9 studies as one of these 10 studies entailed a single group (Table 1). The characteristics of the included studies and adverse birth outcomes in neonates are shown in Table 2.

### Apgar score

Out of the 10 reviewed articles, 8 studies assessed the effect of hypnosis on Apgar score. Brann et al. did not find any significant difference between hypnosis and psychoprophylaxis groups in terms of Apgar scores at 1 (7.5±1.4 vs. 7.3±1.4) and 5 (9±0.6 vs. 8.9±0.5) min (7). Furthermore, Harmon et al. observed no significant difference between hypnosis and breathing exercises/relaxation groups considering the Apgar score at 1 and 5 min (19).

**Table 2.** Characteristics of the included studies and their data on adverse birth outcomes in neonates

Author/year	Study design	Int. group	Cont. group	Subject/Gestation	Number of subjects in Int./Cont.	Cesarean section	Neuraxial/epidural anesthesia	Anesthesia/pain relief drug	Fetal distress	Apgar score	NICU admission	Breastfeeding
Beevi Z, 2017 (4)	Quasi-experimental	Hypnosis	Usual care	Multi/null 2th tri	28/28	8.9% (Int) 17.8% (Cont)	None-sig	Sig lower in Int. group	-	Apgar 1,5: None-sig	-	-
Werner, 2013 (14)	RCT	Hypnosis	1.Relaxation 2.Usual care	Null 3th tri	497/495/230	Sig higher in Int. group	None-sig (3)	-	-	Apgar 5: None-sig	None-sig	None-sig
Cyna, 2013 (16)	RCT	Hypnosis + CD	1.CD only 2. Control	Multi/null 3th tri	154/143/151	None-sig	None-sig	None sig	-	Apgar 5: None-sig	None-sig	None-sig but after 6 months, sig lower in Int. group
Fisher, 2009 (20)	RCT	Hypnosis	Usual care	Multi/null	-	None-sig	None-sig	None sig	-	None-sig	-	-
Abbasi M, 2009 (3)	Quasi-experimental	Hypnosis	-	Multi/ 3th tri	6	None	None	-	-	Apgar 5: All≥8	-	-
Mehl-Madrona, 2004 (9)	RCT	Hypnosis	1. Psychotherapy 2. Usual care	Multi/null 1st, 2th tri	260/260(both controls)	No-sig difference	Sig lower in Int. group	Sig lower in Int. group	None-sig	-	-	-
Martin, 2001 (17)	RCT	Hypnosis	Supportive counseling	2th tri	-	Sig lower in Int. group	Lower in Int. group	Lower in Int. group	-	-	None-sig	-
Letts P.J, 1993 (18)	Quasi-experimental	Hypnosis	1. CNTRL 2. Usual care	Null/multi 3th tri	87/56/352	-	Sig lower in Int. group	None-sig	-	None-sig	-	-
Harmon, 1990 (19)	RCT	Hypnosis	Breathing exercises /relaxation	Null 2th tri	30/30	-	-	Sig lower in Int. group	-	Apgar 1, 5: None-sig	-	-
Brann L.R, 1987 (7)	RCT	Hypnosis	Psychoprophylaxis	-	45/41	None-sig	-	None-sig	-	None sig	-	None-sig

RCT: randomized controlled trial, Int.: intervention, Cont.: control, sig: significant, min: minute, multi: multiparous, null: nulliparous, tri: trimester, CD: compact disk containing hypnotherapist guidance, CM: clinical management, IUFD: intrauterine fetal death, CNTRL: people who either did not learn hypnosis technique or refused hypnosis as an intervention, NICU: neonatal intensive care unit

In another study, Letts et al. divided neonates into three groups, including hypnosis, CNTRL (i.e., people who either did not learn hypnosis technique or refused hypnosis as an intervention), and usual care. Based on their findings, hypnosis group did not significantly differ from CNTRL and usual care groups in terms of the Apgar score of > 6 (18). In a pretest-posttest study, Abbasi et al. assessed the effect of hypnosis on Apgar score. In the mentioned study, five of six subjects had neonates with an Apgar score of 9, and only one of the subjects had neonates with an Apgar score of 8 (3).

Cyna et al. observed no significant difference between hypnosis and control groups (relative risk: 0.49, 95% CI: 0.05-5.32; P=0.55), as well as between those who received education using a CD and control groups (relative risk was 0.53: 95% CI: 0.05-5.27; P=0.597) in terms of the Apgar score of < 7 at 5 min (16). Werner et al. compared three groups, namely hypnosis, relaxation, and usual care group. In the mentioned study, the comparison of the three groups revealed no significant difference concerning the Apgar score of < 7 at 5 min (P=0.89) (14).

Likewise, Beevi et al. reported no significant difference between hypnosis and usual care groups in terms of Apgar score at 1 (P=0.498) and 5 min (P>0.05) (4). In another study, Fisher et al. compared hypnosis and usual care and observed no significant difference between these groups

considering Apgar score (20). Together, based on eight studies, the hypnosis of mothers during labor had no effect on neonates' Apgar score at 1 and 5 min.

#### Admission to Neonatal Intensive Care Unit

Three studies assessed the effect of hypnosis on NICU admission among neonates. The first study performed by Cyna et al. (16) compared three groups, including hypnosis, hypnosis plus CD (hypnotherapy guides), and control, in terms of the number of neonates admitted to high-dependency unit/intensive care unit (HDU/ICU). Their results showed no significant difference between the hypnosis and control groups (relative risk: 1.47, 95% CI: 0.25-8.68; P=0.670), as well as between the CD and control groups (relative risk: 3.70, 95% CI: 0.78-17.50; P=0.099) in terms of the neonatal admission to HDU/ICU. In addition, they detected no significant difference between the CD and control groups (relative risk: 0.93, 95% CI: 0.67-1.30; P=0.674), as well as between the CD and control groups (relative risk: 1.02, 95% CI: 0.75-1.39; P=0.906) regarding the number of the newborns admitted to the special care neonatal unit.

Werner et al. compared three groups, namely hypnosis (n=493), relaxation (n=494), and usual care (n=230) groups and found no significant difference among them regarding the number of the newborns admitted to the neonatal ward (14).

As the findings of the reviewed studies indicated, there was no significant difference between the hypnosis group and other groups considering the number of admission to NICU.

### **Difficulties in lactation**

In a study performed by Werner (14), there was no statistically significant difference among the three groups (i.e., hypnosis, relaxation, and usual care groups) between weeks 0 and 4 ( $P=0.43$ ), between months 1 and 4 ( $P=0.95$ ), and 4 months postpartum ( $P=0.52$ ) in terms of difficulties in lactation. In another study performed by Cyna et al. (16), no significant difference was observed among the groups regarding the rate of exclusive breastfeeding upon hospital discharge; however, this parameter significantly varied among groups after six months ( $P<0.05$ ).

Moreover, Brann and Guzvica (7) reported that 60% of mothers in hypnosis group continued breastfeeding, compared to 50% of mothers in psychoprophylaxis group. In sum, hypnosis had no negative effects on the continuation of exclusive breastfeeding in the short run as shown by the above-described three studies. Only one study reported a lower long-term breastfeeding rate in hypnosis group than that in control group (16).

### **Other complications**

The duration of neonatal ward or NICU stay was not indicated in any studies. Only one study reported that there was no significant difference among hypnosis group and the others in terms of readmission to the hospital (16).

## **Discussion**

In this systematic review, we evaluated the findings of ten studies, focused on the effect of hypnosis on neonatal outcomes. It was found that hypnosis has no statistically significant effect on the enhancement of fetal distress, NICU admission, and long-term complications or reduction of Apgar score and breastfeeding. Some studies did not discuss the neonatal outcomes and only focused on maternal issues; however, we tried to collect available information in this regard and draw a conclusion based on the reported evidence.

As stated above, since all published reports were primarily focused on the maternal outcomes of hypnosis intervention, we considered this issue in the first stage. For example, in a qualitative study, participants indicated the efficiency of

hypnosis in pain relief. Consequently, the intervention group who received hypnosis reported a decrease in the fear of natural childbirth. Furthermore, the labor time was reported to be decreased following the use of this intervention, compared to that of the previous childbirth (3).

Regarding this, it may be concluded that hypnosis can give the pregnant women a sense of control and confidence over the labor process. Another theory is that the pain experience does not change in hypnosis group rather hypnosis improves subject's tolerance against the perceived pain (19).

Most of the published studies suffer from some critical issues including, different hypnotizability levels among groups, different methods of teaching self-hypnosis, marked gaps between education time points (i.e., different time periods between sessions), few hypnosis sessions, small sample size, and an overall low adherence to intervention (e.g., one study reported that only a minority of women actually attended all three sessions and listened to all four CDs [16]).

Finally, due to the nature of hypnosis, double-blinding was unlikely. However, the positive point is that various numbers of sessions and starting time points (i.e., gestational age) were tested. Furthermore, the majority of the studies were based on low-cost interventions in an attempt to find an approach that could be easily performed in any settings.

Two well-designed randomized controlled trials with large sample sizes (which are expected to benefit from higher power) and proper adherence to antenatal training, compared to the previously published projects, did not find any statistically significant difference between intervention or control groups concerning the use of analgesics during labor and childbirth, mode of delivery, use of oxytocics in nulliparous or multiparous women (16), duration of labor, frequency of vaginal birth, number of interventions, neonatal outcomes, and success of lactation in nulliparous women (14). However, it should be noted that also no adverse effects following these interventions were reported.

One study showed that Apgar score and birth weight were higher in the experimental group than those in the other groups; however, this difference was not statistically significant. It has been shown that anxiety and depression are not related to preterm birth or birth weight. Nonetheless, women with anxiety disorders have been reported to have neonates with relatively

lower Apgar scores at 1 and 5 min after birth (21).

## Conclusion

Based on the evidence reported in the literature, it could be concluded that in pregnant women, hypnosis can be regarded as a safe approach for pain management. Moreover, it was found that hypnosis does not affect neonatal health status.

## Acknowledgments

None.

## Conflicts of interests

None declared.

## References

- Cyna A, Andrew MI, McAuliffe GL. Antenatal self-hypnosis for labour and childbirth: a pilot study. *Anaesth Intensive Care*. 2006; 34(4):464-9.
- VandeVusse L, Irland J, Healthcare WF, Berner MA, Fuller S, Adams D. Hypnosis for childbirth: a retrospective comparative analysis of outcomes in one obstetrician's practice. *Am J Clin Hypn*. 2007; 50(2):109-19.
- Abbasi M, Ghazi F, Barlow-Harrison A, Sheikvatan M, Mohammadyari F. The effect of hypnosis on pain relief during labor and childbirth in Iranian pregnant women. *Int J Clin Exp Hypn*. 2009; 57(2):174-83.
- Beevi Z, Low WY, Hassan J. The effectiveness of hypnosis intervention for labor: an experimental study. *Am J Clin Hypn*. 2017; 60(2):172-91.
- Lang EV, Benotsch EG, Fick LJ, Lutgendorf S, Berbaum ML, Berbaum KS, et al. Adjunctive non-pharmacological analgesia for invasive medical procedures: a randomised trial. *Lancet*. 2000; 355(9214):1486-90.
- Montgomery GH, David D, Winkel G, Silverstein JH, Bovbjerg DH. The effectiveness of adjunctive hypnosis with surgical patients: a meta-analysis. *Anesth Analg*. 2002; 94(6):1639-45.
- Brann LR, Guzvica SA. Comparison of hypnosis with conventional relaxation for antenatal and intrapartum use: a feasibility study in general practice. *J R Coll Gen Pract*. 1987; 37(303):437-40.
- Gravitz MA. Early uses of hypnosis as surgical anesthesia. *Am J Clin Hypn*. 1988; 30(3):201-8.
- Mehl-Madrona LE. Hypnosis to facilitate uncomplicated birth. *Am J Clin Hypn*. 2004; 46(4):299-312.
- Smith CA, Collins CT, Cyna AM, Crowther CA. Complementary and alternative therapies for pain management in labour. *Cochrane Database Syst Rev*. 2006; 4:CD003521.
- Huntley AL, Coon JT, Ernst E. Complementary and alternative medicine for labor pain: a systematic review. *Am J Obstet Gynecol*. 2004; 191(1):36-44.
- Cyna AM, McAuliffe GL, Andrew MI. Hypnosis for pain relief in labour and childbirth: a systematic review. *Br J Anaesth*. 2004; 93(4):505-11.
- Shah MC, Thakkar SH, Vyas RB. Hypnosis in pregnancy with intrauterine growth restriction and oligohydramnios: an innovative approach. *Am J Clin Hypn*. 2011; 54(2):116-23.
- Werner A, Ulbjerg N, Zachariae R, Nohr EA. Effect of self-hypnosis on duration of labor and maternal and neonatal outcomes: a randomized controlled trial. *Acta Obstet Gynecol Scand*. 2013; 92(7): 816-23.
- Werner A, Ulbjerg N, Zachariae R, Rosen G, Nohr EA. Self-hypnosis for coping with labour pain: a randomised controlled trial. *BJOG*. 2013; 120(3): 346-53.
- Cyna AM, Crowther CA, Robinson JS, Andrew MI, Antoniou G, Baghurst P. Hypnosis antenatal training for childbirth: a randomised controlled trial. *BJOG*. 2013; 120(10):1248-59.
- Martin AA, Schauble PG, Rai SH, Whit Jr R. Effects of hypnosis on the labor processes and birth outcomes of pregnant adolescents. *J Fam Pract*. 2001; 50(5):441-3.
- Letts PJ, Baker PR, Ruderman J, Kennedy K. The use of hypnosis in labor and delivery: a preliminary study. *J Womens Health*. 1993; 2(4):335-41.
- Harmon TM, Hynan MT, Tyre TE. Improved obstetric outcomes using hypnotic analgesia and skill mastery combined with childbirth education. *J Consult Clin Psychol*. 1990; 58(5):525-30.
- Fisher B, Esplin S, Stoddard G, Silver R. Randomized controlled trial of hypnobirthing versus standard childbirth classes: patient satisfaction and attitudes towards labor. *Am J Obstet Gynecol*. 2009; 201(6):S61-2.
- Berle J, Mykletun A, Daltveit AK, Rasmussen S, Holsten F, Dahl AA. Neonatal outcomes in offspring of women with anxiety and depression during pregnancy. A linkage study from The Nord-Trøndelag Health Study (HUNT) and Medical Birth Registry of Norway. *Arch Womens Ment Health*. 2005; 8(3):181-9.