Investigating the Effect of Hypnotherapy on Reducing Anxiety and Pain during Labor

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Abstract

Background: Majority of women go through levels of anxiety during pregnancy. In this respect, anxiety and fear of labor pain are among the most common causes for elective Cesarean-section as a preferred type of childbirth by pregnant women. However, Caesarean-section delivery as a surgical technique can be accompanied by adverse side effects and outcomes for mother-infant health. Thus, the use of non-pharmaceutical approaches moderating anxiety and pain during labor can be beneficial in promoting the health status of mothers and babies. Accordingly, the purpose of the present study was to investigate the effect of hypnotherapy on reducing anxiety and pain during labor among pregnant women.

Methodology: This study was an experimental research with a pre-test/posttest design comprised of experimental and control groups. Among the pregnant women referring to hospitals affiliated to Social Security Organization in Mazandaran Province, 30 nulliparous pregnant women with gestational age of 27-33 weeks were selected via convenience sampling method and then they were randomly designed to experimental and control groups of 15 individuals. The research instruments in this study included the Spielberger State-Trait Anxiety Inventory (STAI), McGill Pain Questionnaire (Index), as well as the Standard Numeric Rating Scale (NRS) and Visual Analogue Scale (VAS). In addition to routine prenatal care for pregnant women in the experimental group, hypnotherapy was used for 8 sessions to reduce prenatal anxiety and then it was employed to moderate pain during labor as an analgesic. However, the control group only received routine prenatal care. The data were also analyzed using the SPSS software (version 25) and parametric test of Covariance (ANCOVA); independent t test and nonparametric U Mann Whitney

Findings: Comparing the post-test state-trait anxiety in both control and experimental groups, it was found that hypnotherapy could reduce anxiety in pregnant women in the experimental group. Furthermore; comparing the variable of pain in the experimental and control groups revealed that the mean score of pain in the experimental group was lower than the significance level (p-value<0.00).

Conclusion: It was concluded that hypnotherapy was effective in reducing anxiety and pain during labor and it could be used as a non-pharmaceutical approach during pregnancy and childbirth care.

Keywords: Hypnotherapy; State Anxiety; Trait Anxiety; Labor Pain.

1. Introduction

The process of pregnancy and parenting is considered as one of the biggest psychological and biological changes associated with anxiety symptoms. Although provision of physical care for pregnant women has been expanded over hundreds of years in developed countries, mental health

care has been still neglected as an important part in childbirth and midwifery. In this respect, most women are likely to suffer from an onset or worsening of anxiety disorders during their pregnancy (Malary, Shahhosseini, Pourasghar & Hamzehgardeshi, 2015).

About 7-20% of pregnant women experience stress and anxiety concerning their decreased daily ability and functioning due to insomnia, obsessive thoughts, neuromuscular pains, panic attacks, hot flushes, or restlessness. It has been also proven that prenatal anxiety can predict physiological, mental-psychological, and motor growth, as well as behavioral-emotional problems in early childhood. Similarly, some studies have revealed that the symptoms of too much stress and anxiety reported before childbirth have been accompanied by a possible increase in levels of depression in postpartum period (Legrand, Grévin-Laroche, Josse, Polidori, Quinart, & Taïar, 2017).

As well; pain has been considered as a multidimensional experience with its own physiological, psychological, and social aspects. In terms of grading labor pain, it has been introduced as one of the most severe pains compared with all types of pain (Melzack, & Wall, 1988). Majority of pregnant women are also afraid of pain during labor. The given fear, like anxiety, can be accompanied by more painful experiences (Leeman, Fontaine, King, Klein & Ratcliffe, 2003). Reminding labor pain may be also harmful and cause distress and anxiety about future deliveries and, according to some experts, lead to severe negative reactions affecting sexual and psychological outcomes after childbirth (Stewart, 1982).

Extreme fear of labor can cause anxiety and pain during pregnancy which may play a role in opting for elective Cesarean-section (C-section) delivery by mothers. Requests for C-section with no medical or obstetric reasons are a general issue in the twenty-first century and the most common cause for elective C-section is the fear of natural (vaginal) delivery. According to the results of the review study by Gibbense (2010), Iran with a rate of 41.9% has the second place following Brazil (45.9%) in terms of C-section delivery which is higher than the acceptable percentage proposed by the World Health Organization (WHO) (i.e. 10-15%) (Andaroon, Kordi, Kimiaei & Ismaili, 2017). One of the main reasons for C-section is the increase in clients' own requests. In this respect, pregnant women consider this type of childbirth as a method with less pain and fewer side effects than natural delivery. Death rate from C-section is also seven times higher than that in natural delivery, and the main side effects of C-section delivery can include postpartum endomyometritis, bleeding, urinary tract infection, and thromboembolism. C-section can also have risks for infants such as premature birth, transient tachypnea of the newborn (TTN), persistent pulmonary hypertension of the newborn (PPHN), as well as injuries such as wounds, bruises, or other problems (Jamshidi Avanaki, Khakbazan, Babaei & Seyyed Nouri, 2004).

Treatment of pain in patients is one of the uses of hypnosis. Today, this phenomenon is employed across the world on a large scale to reduce the consumption of synthetic and chemical drugs as well as narcotics and to lower costs of treatments and pressures on insurance companies. Hypnotherapy can be also considered as an effective approach to pain treatment in decision-making systems (Agah, 2010). In this respect, hypnosis can be effective through three major mechanisms for controlling pain: muscle relaxation, perceptual change, and cognitive distraction. Most often, pain is accompanied by reactive muscle tension; thus, techniques that create more relaxation can reduce pain in the body (Sadock, Sadock & Ruiz, 2005).

Despite the benefits of using hypnosis in moderating pain and anxiety during labor, the clinical use of this approach has been underestimated, especially in Iran. Therefore, research studies examining the clinical benefits of this treatment can provide great services to mother-infant health in a community. Accordingly, the purpose of this research study was to investigate the effect of hypnotherapy as a non-pharmaceutical approach on reducing anxiety and pain during labor in pregnant women.

2. Materials and Methods

This study was of applied experimental research type because it was to investigate the effect of hypnotherapy on pregnant women. To this end, the study participants were selected through

convenience sampling method. Then, they were randomly assigned to experimental and control groups. To conduct the clinical trial in this study, a pretest/posttest design was used. The statistical population also consisted of pregnant women referring to hospitals affiliated to Social Security Organization in Mazandaran Province. Using a cross-sectional design; at first, three hospitals from five hospitals affiliated to Social Security Organization in Mazandaran Province were randomly selected. After that, 30 nulliparous women with a gestational age of 27-33 weeks, referring to the mentioned hospitals between October 2017 and March 2017 in order to control their pregnancy and delivery, were selected using convenience sampling method and then they were randomly assigned to two groups of 15 individuals in the experimental (13 people after the sample loss) and control (12 individuals following the sample loss) groups.

The inclusion criteria in this research study were nulliparous women with the gestational age of 27-33 weeks, no contraindication of natural delivery, completion of consent form, no infection with major depressive disorder or suicidal thoughts, no uncontrolled seizure, as well as no paranoid, anti-social, and psychotic personality disorder. The mentioned criteria were investigated during interviews with the pregnant women. The exclusion criteria were also unwillingness to cooperate in the research study at any time, being absent in more than two sessions out of the total eight sessions, as well as occurrence of contraindication of natural delivery in the process of research implementation.

To observe the ethical considerations, the reasons for conducting the research as well as its procedure and conditions were explained to the pregnant women participating in this study during the initial interviews; then, the consent form was completed by the pregnant women and their husbands. During the research procedure, each participant who was unwilling to continue cooperation was allowed to withdraw. The principle of confidentiality as an important research principle was also observed. Moreover, the pregnant women attended all hypnotherapy sessions free of charge during their pregnancy and delivery.

Based on similar research studies (Downe et al., 2015; Cyna et al., 2011; Finlayson, 2015; Harmon, 1990; Freeman, 1986), the number of hypnotherapy sessions was considered by eight sessions of 50 minutes. The content of the training sessions was as follows:

- Session One: taking a medical history, explaining the project, and determining the prevailing modulated sense in mothers, and also specifying their hypnotic personality characteristics as well as correcting misunderstanding about hypnotherapy
- Session Two: inductions, deepening, and suggestions to increase relaxation, senselessness, and lack of pain
- Session Three: strengthening ego to control pain and anxiety
- Session Four: practicing the control room of the mind to deal with anxiety and pain
- Session Five: age return to moderate anxiety-provoking and painful experiences in the past
- Session Six: age progress and successful labor experience with relaxation and pain control
- Session Seven: forgiving oneself or others and teaching self-hypnosis
- Session Eight: wrapping up previous sessions and teaching conditionalization to reduce labor pain

One of the research instruments used in this study was a demographic characteristics questionnaire including items such as age, education levels, occupation, gestational age, place of residence (city-village), history of infertility, and history of being affected with anxiety disorders.

The Spielberger State-Trait Anxiety Inventory (STAI) was another questionnaire employed in the present research study. This questionnaire consisted of separate self-measurement scales for state-trait anxiety. The state anxiety is one whose occurrence is situational and it is also devoted to stressful situations and the trait anxiety signifies individual differences in response to stressful situations with different levels of state anxiety (Spielberger, Gorsuch, Lushene, Vagg & Jacobs, 1983). The STAI was developed in 1970 by Spielberger containing 40 items in which items 1 to 20

are assigned to the state anxiety and items 21 to 40 are devoted to the trait one. Items related to the state anxiety are scored via a four-point Likert-type scale (*never*, *sometimes*, *usually*, and *almost always*) and the items related to the trait anxiety are also scored the same including *never*, *sometimes*, *usually*, and *almost always* (Spielberger, Gorsuch, Lushene, Vagg & Jacobs, 1983). The Cronbach's alpha coefficients for the sub-scales of the state-trait anxiety were also respectively reported by 0.92 and 0.90 by Spielberger et al. (1970). Moreover, the coefficients of the test-retest reliability for the state-trait anxiety were obtained by 0.62 and 0.68; respectively.

In a research study on 219 patients affected with generalized anxiety disorder, major depressive disorder, and normal individuals; Cronbach's alpha coefficient for the scale of state anxiety was 0.92 and that was 0.90 for the trait one (Taghavi, Najafi, Kianersi & Aghayan, 2013). The results of another study conducted on 600 individuals in the city of Mashhad in Iran also revealed that the reliability of this questionnaire measured through Cronbach's alpha coefficient for the scales of state anxiety, trait anxiety, and the total scale was 0.91, 0.90, and 0.94; respectively (Safavi & Ma'aroufi, 2012).

The other questionnaire used in this study was McGill Pain Questionnaire (Index) with a set of statements aimed at measuring individuals' perception of pain in a variety of dimensions including sensory, affective, and evaluative perceptions of pain, as well as pains of various types and diverse origins. The McGill Pain Questionnaire (Index) is one of the most prominent instruments for pain measurement which was administered for the first time by Melzack on 297 patients suffering from different types of pain (Melzack, 1975). The given questionnaire includes two independent factors: one called sensory pain describing pain experience by a person, and the other one is affective pain that illustrates and accounts for the effect of the sense of pain experience (Mason, Arceneaux, Abouhassan, Lauterbach, Seebach & Fauerbach, 2008). The reliability and validity of this questionnaire was determined by Durkin et al. in 2009. The findings of this study also showed a high reliability and validity for this questionnaire. As well, the results of exploratory and confirmatory factor analyses indicated four pain scales including chronic pain, varied pain, neuroleptic pain, and affective pain. The Cronbach's alpha coefficients for the given scales were also reported by 0.87, 0.87, 0.83, and 0.86; respectively (Dworkin, Turk, Revicki, Harding, Coyne & Peirce-Sandner, et al., 2009). This questionnaire was reviewed in Iran and its validity and reliability were reported to be desirable. For example, Khosravi et al. (2012) reported the total Cronbach's alpha coefficient of 0.85 in their investigation (Khosravi, Sadighi, Sanambar, Moradi & Zendehdel, 2013). In another study, Cronbach's alpha coefficient for this questionnaire was reported by 0.7336 (Fathi, 2014).

Another research instrument employed in this study was the Standard Numeric Rating Scale (NRS) and Visual Analogue Scale (VAS). Within the NRS and VAS, the patient shows the severity of their pains in numbers from 0 to 10 on a scale. It is clear that the higher the scores selected by patients, the more the severity of pain. This research instrument has been extensively used and its validity and reliability have been proved in terms of acute pain. This scale is the modified form of Johnson's NRS and VAS that was endowed with good construct and concurrent validity (0.816). It had also positive correlation for examining the severity of pain.

In one study, the validity and the criterion validity of this scale ranged from 0.76 to 0.84, and its reliability was estimated by 0.60 to 0.77 using different methods (Ghamari Givi, Share'ei, Mohammadipour Rik, Abolghasemi & Nader Pilehrood, 2012). Atashzadeh Shoorideh as well as Bastani et al. (2015) in their study used the NRS and VAS for the measurement of the severity of the pain. The validity of this questionnaire using content and face validity and its reliability measured via internal consistency method were also determined by r=0.88 (Bastani, Sobhani & Emamzadeh Ghasemi, 2015).

3. Research Procedure

To measure the level of state-trait anxiety, the STAI was administered. Before the onset of hypnotherapy, levels of anxiety in both study groups were measured during the first session. After

eight 50-minute weekly hypnotherapy sessions for the experimental group, the levels of anxiety in both experimental and control groups were re-measured at the end of the eighth session. Individuals in the experimental group also became familiar with hypnotherapy during therapeutic sessions and practiced self-hypnosis exercises at home based on the subjects of the sessions. After the end of the therapeutic sessions, self-hypnosis continued until the delivery time on a daily basis by mothers. With the start of uterine contractions and the active labor phase, the hypnotic inductions of no pain during labor were performed by the therapist for the pregnant mothers during delivery. The severity of pain during labor was also measured through the NRS and VAS and then the McGill Pain Questionnaire (Index) was used immediately after the end of the third labor phase in the labor room to examine the quality of pain in both experimental and control groups.

4. Findings

The mean age of the individuals in the control group was 25.24 and the standard deviation of their age was 5.52. The mean and standard deviation of age in the experimental group was also 28 and 4.14; respectively. The two study groups did not have a significant difference in their mean age (p-value=0.080). The mean gestational age of the control group was 34.75 and their standard deviation was 1.65. The mean and the standard deviation of gestational age in the experimental group were also 33.69 and 2.21; respectively. It was observed that gestational age in both groups was not statistically significant (p-value=0.192).

Table 1

group	control		experimental	
	mean	standard deviation	mean	standard deviation
age	24.25	5.52	28	4.71
independent t-test results	t=1.831 df=23 p-value=0.08			
gestational age	34.75	1.65	33.69	2.21
independent t-test results	t=1.343 df=23 p-value=0.192			

Table 2. Frequency distribution and educational percentage of research units in control and experimental group

education levels	control		experimental	
	frequency	percentage	frequency	percentage
high school diploma and higher	8	66/7	6	46/2
university graduate	4	33/3	7	53/8
total	12	100	13	100
Consequence of Chi-squared test	$\chi^2 = 1/06$df=1 p-value=0/302			

As shown in the table2 the p value in Chi-square test is achieved 0/302 it was shown that there were no significant differences between the control and experimental group in terms of education and were homogeny.

Fischer's exact test results for the other demographic information presented in table3 show that there were no significant differences between two groups and were hemogen and majority of pregnant women were resident of the city and they haven't history of infertility and anxiety symptoms.

Table 3

variable	group	control		experimental		P value
		frequency	percentage	frequency	percentage	
occupation	housewife	9	75	11	84.6	0/787
	employee	2	16.8	2	45.4	
	university students	1	8.3	0	0	

place of residence	city	9	75	12	92.3	0/322
	village	3	23	1	7.7	
infertility status	yes	0	0	1	7.7	0/999
	no	12	100	12	92.3	
anxiety symptoms	yes	1	8.3	1	7.7	0/999
	no	11	91.7	12	92.3	

Table 4. Normality review of anxiety score using Shapiro vilk test

group		Variable	z	Degree of freedoom	Level of significance	normality
Pretest	**experimental**	Trait anxiety	0/949	13	0/577	normal
		State anxiety	0/959	13	0/734	normal
		anxiety	0/934	13	0/386	normal
	control	Trait anxiety	0/895	12	0/136	normal
		State anxiety	0/942	12	0/524	normal
		anxiety	0/919	13	0/281	normal
Post.test	**experimental**	Trait anxiety	0/924	13	0/280	normal
		State anxiety	0/912	13	0/196	normal
		anxiety	0/924	13	0/287	normal
	control	Trait anxiety	0/891	12	0/120	normal
		State anxiety	0/959	12	0/769	normal
		anxiety	0/896	12	0/140	normal

The score listed in the table4 shown variables distribution are normal. Given the distribution of research variables (anxiety; trait and state anxiety) in pre and post-test are normal and measurement scale was interval scale; for data analysing Ancova parameteric test hase employed.

Table 5. Mean score and standard deviation in control and experimental group

group	test	index	Trait anxiety	State anxiety	anxiety
experimental	Pretest	M	39/15	43/00	82/15
		SD	8/01	8/92	15/68
	Post.test	M	25/67	22/15	47/82
		SD	2/35	1/72	3/31
control	Pretest	M	38/58	42/50	81/08
		SD	10/59	8/58	18/31
	Post.test	M	40/17	45/83	86/00
		SD	11/61	10/09	21/11

Results of table 5: mean score and standard deviation in anxiety and it's component (trait and state anxiety) ividedd in to two group is presented in the table. the pretest anxiety mean score in experimental group was 82/15 and post-test mean score was 47/82; in control group was 81/08 and 86 respectively which in descriptive term the post-test mean scores in experimental group was lower than pre-test scors but the post test scores in control group were increased.

Table 6. McGill numerical indices of pain in control and experimental groups and their test of significance

McGill pain	control		experimental		**Mann-Whitney U test results**
	mean	**standard deviation**	**mean**	**standard deviation**	
sensory	21.91	4.98	6.69	3.7	p-value<0.001
affective	6	1.9	0.84	0.8	p-value<0.001
evaluative	4	1.34	0.84	1.14	p-value<0.001
varied	11	3.46	2.76	2.27	p-value<0.001

The findings in Table 5 indicated that pain in the experimental group was significantly lower than that in the control group (p-value<0.001).

Table 7. Distribution of frequency and percentage of severity of pain among participants in control and experimental groups and its test of significance

pain group	control		experimental	
	frequency	percentage	frequency	percentage
mild	0	0	1	7.7
moderate	0	0	7	53.8
severe	0	0	4	30.8
very severe	3	25	1	7.7
profound (unbearable)	9	75	0	0
total	12	100	13	100
standard deviation ± mean	9.66±0.65		4.84±2.07	
Mann Whitney U test	p-value<0.001			

The results of the non-parametric test of Mann-Whitney U test were illustrated in Table 6 revealing that pain in the experimental group was significantly lower than that in the control group (p-value<0.001). There can be seen that pain in most women in the control group was at profound (unbearable) levels by 75%, but 53.8% of the women in experimental group had moderate levels of pain.

5. Discussion

The results of this study demonstrated that the mean score of anxiety at the end of the research study was significantly lower in the experimental group and it also decreased compared with that in the control group, so the research hypothesis was confirmed. In this regard, Abbasi (2014) investigated the effect of hypnosis on reducing anxiety during labor in pregnant women (VandeVusse, Irland, Healthcare, Berner, Fuller & Adams, 2007). In this quasi-experimental study, conducted with a control group (12 individuals) and an experimental group (12 individuals), the findings showed that hypnosis was effective as a complementary and safe treatment for anxiety in pregnant women (Abbasi Fashami, 2013). Moreover, the results of of Hammond's meta-analysis (2010) revealed that hypnosis had been useful in reducing state anxiety along with stressful situations (Hammond, 2010).

It should be noted that individuals' physical functions can be controlled by the autonomic nervous system, which can be affected by their minds. They are, in fact, the unintentional psychological reactions that are apparently out of individuals' control and intention. The minds of individuals are also able to control their bodies. During hypnosis, people receive relaxing inductions and they are asked to focus on imagery for relaxation which can cause mental relaxation, followed by physical relaxation and reduced muscle tensions.

Also, the findings of the present study suggested that hypnosis could significantly reduce pain in the experimental group compared to that in the control group. The McGill Pain Questionnaire (Index) scores in the sensory, affective, evaluative, and varied dimensions were respectively 21.91, 6, 4, and 11 in the control group and 6.69, 0.84, 0.84, and 2.76 in the experimental group indicating that hypnosis had reduced pain in the experimental group. Given the measurement of severity of pain using NRS and VAS, it was concluded that pain in the experimental group was significantly lower than that in the control group. It was also found that pain in most women i.e. 75% in the control group was at profound (unbearable) levels and 53.8% of women in the experimental group were suffering from moderate pain. These results were consistent with the findings by Saadatmand in 1994 (Saadatmand, 1995) and Vandevusse in 2011 (VandeVusse, Irland, Healthcare, Berner, Fuller & Adams, 2007) in terms of the impact of hypnotherapy on pain relief. In his review study, Madden (2016) observed no significant difference

in reducing pain between experimental and control groups in the investigations reviewed. He explained that there were few studies examining the use of hypnosis during childbirth. Although interventions could show a bit of hope, further research studies were needed on the clinical benefits of controlling and managing pain in care centers for pregnant mothers. He also stated that more research studies with higher quality were required because the number of women examined had been small (Madden, Middleton, Cyna, Matthewson & Jones, 2016). In explaining the reason for the effect of hypnotherapy in reducing pain, it was argued that the presence of segregation and induction, as two components of the three most important components of the hypnotic condition, were effective. Hypnotic inductions could also distract a person from the delivery environment and her attention could be focused on pleasant imagery, so perception of pain could be reduced, and direct hypnosis could lower the severity of pain in a person and make her feel less painful. Thus; it was concluded that using this simple and inexpensive approach with no side effects could lead to satisfaction with the process of delivery.

It is suggested to conduct further research studies at a wider level and with more sample size. During labor, a hypnotherapist can be also preferably a gynecologist or a midwife who is responsible for controlling pregnancy and childbirth, in order to maintain their authority at a higher-level during hypnotherapy. To create high-grade analgesia, samples should be selected from individuals with high hypnotic levels. Therefore; hypnotherapy, as an inexpensive and safe approach to reduce anxiety and labor pain should be included in the prenatal care procurement protocol by the Ministry of Health, Treatment, and Medical Education.

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