

Original Article

Relaxation – Focused Nursing Care in Threatened Preterm Birth: Can it be a Complementary Treatment?

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Abstract

Preterm birth is stated to be one of the research priority issues of the World Health Organization. This is due to the prevalence of preterm birth with high rates in developed and developing countries in spite of increasing technology, treatment, and care possibilities. Preterm birth rates are high in our country, too. One of the preventable causes of preterm birth is stress. Stress has been proven to cause threatened preterm birth by recent research in the literature. In this article, relaxation-focused nursing care (RFNC) was developed based on the HypnoBirthing philosophy and transactional model that can be used to reduce stress in women with threatened preterm birth. While the HypnoBirthing philosophy argues the birth process is a normal, natural and healthy function, the transactional model treats stress as a relationship between individuals and their environment. This program was developed to extend the pregnancy period of women who are pregnant and have threatened preterm birth and to protect and improve the health of mother and fetus. The program was scheduled for 16 hours in two days. A study in which the program was applied reported that the anxiety of the mother decreased, the duration of pregnancy was extended, and the satisfaction with nursing care increased.

Keywords: Relaxation-focused nursing care, threatened preterm birth, HypnoBirthing, Transactional model.

Introduction

Threatened preterm birth (TPB) is defined as a condition in which regular and painful uterine contractions are accompanied by <2 cm cervical dilatation and <80% effacement, as well as the development of early membrane rupture (Ville & Rozenberg, 2018). Around 40-45% of preterm birth (PB) occurs with the onset of spontaneous preterm birth (Goldenberg et al., 2008). The rate of PB in developed countries has been reported to increase from 2.0 million in 1990 to 2.2 million in 2010 (Blencowe et al., 2012). Blencowe et al. (2013) reported that preterm birth rates ranged from 5 to 7% in developed countries and that more than 60% of PBs occurred in Sub-Saharan African countries (Blencowe et al., 2013). The rate of PB is about 5% in Northern European countries (Blencowe et al., 2012), 11.4% in the United States (Schoen et al., 2015), and 12% in Turkey (Blencowe et al., 2012). It is difficult to compare PB rates in low

and middle-income countries due to insufficient data (Blencowe et al., 2013). Preterm birth accounts for 28% of neonatal deaths without congenital anomalies around the world (Lawn et al., 2010). Approximately 1 million in fifteen million live PBs a year end up with neonatal deaths (Blencowe et al., 2013).

When the known causes of TPB are examined, 70 to 80% starts spontaneously, while the remaining 20-30% is of iatrogenic origin (Taner & Ekin, 2014). The causes of iatrogenic preterm birth include preeclampsia-eclampsia, placenta-induced bleeding (placental abruption, placenta previa), intrauterine growth restriction, and fetal distress (Kafkaslı, 2014). Other risk factors are uterine trauma and anomalies (Heinonen et al., 2013), black race (Kistka et al., 2007), low body mass index (BMI) (Goksever, Kılıç & Erata, 2008), smoking and alcohol consumption (ACOG, 2014), infection (WHO, 2014), maternal age (Aynıoğlu, 2014) multiple pregnancy (WHO,

2014), genetics (WHO, 2014; ACOG, 2014), stress (Jallo et al., 2017), previous preterm delivery, cervical incompetence, short inter-pregnancy interval, cervical or uterus operations (ACOG, 2014). One of the preventable and mitigable causes of TPB is stress. A considerable number of studies have found that maternal cortisol levels cause TPB (Hoffman et al., 2016; Karakash et al., 2016; Diego et al., 2009). Stress can cause TPB in women, while hospitalization for TPB can increase stress, as well (Oliveira & Mandu, 2015). The uncertainty of the length of hospital stay due to TPB in women is also one of the sources of stress (Jallo et al., 2017). Women diagnosed with TPB are generally hospitalized and treated (Sosa et al., 2015). The duration of hospitalization due to pregnancy-related risks in 2017 was reported to be 2.7 days on average in Turkey (Turkey's Health Ministry, 2017). During this period, women experience some physical problems such as a decrease in muscle functions, edema, and pain (Maloni, 2010), and psychological problems including stress, fear, worry, anxiety, and the like (Rodrigues et al., 2016; Oliveira & Mandu, 2015). Besides, women experience anxiety about separation from home and family, child care, transfer of household responsibilities to the husband, loss of control, fatigue, and health problems of herself and the fetus (Janighorban et al., 2018). As the length of hospital stay extends, women experience a variety of emotions from boredom to anger, and sadness to hope (Pohlmann et al., 2016; Rubarth et al., 2012). Also, hospitalization of women brings about an increase in medication and health costs (Maia et al., 2019). Moreover, intensive care costs for premature newborns make up a high economic burden worldwide (Coloma et al., 2018; Lucovnik, Chambliss & Garfield, 2013).

Priority in the treatment of TPB is to stop uterine contractions and to prevent the progression of cervical dilatation and effacement occurring due to these contractions. This approach aims to administer antenatal corticosteroids and to gain time for transferring the woman to a health facility that has a neonatal intensive care unit (Nour, 2012). Today, there is controversy about the effectiveness of the methods developed for the prevention of TPB. Positive opinions have been reported about the determination of cervical length with transvaginal ultrasound (Romero et al., 2016), antenatal corticosteroid administration (Roberts et al., 2017; ACOG, 2016), cervical cerclage (Goya et al., 2016), and progesterone

application (NICE, 2015; FIGO, 2015). However, there is insufficient evidence about tocolysis (ACOG, 2016; Wagner et al., 2016), cervical pessary, (Dugoff et al., 2018; Tsikouras et al., 2018), hydration (Stan et al., 2013), and bed rest (Sosa et al., 2015; Carty-Singleton & Sciscione, 2014).

Additional non-invasive evidence-based methods are needed because of the high prevalence of preterm birth worldwide, high rates of neonatal mortality, high economic burden posed by them, and insufficient evidence of treatment options (Wagner et al., 2016; Hermans et al., 2015). One of the causes of TPB is known to be stress. Therefore, prevention and reduction of stress in TPB may be significant for the health of both pregnant and fetus. In this process, nurses have important responsibilities. They should evaluate women for stress before and during pregnancy. Besides, nurses should identify the stressors of women and plan interventions accordingly and empower women with pregnancy so that they can cope with stress. Also, nurses should try to understand the emotions of women in this process and employ strategies that make women feel that nurses support them throughout the process (Pohlmann et al., 2016). During the TPB process, nurses are recommended to evaluate the stress levels of women and to apply relaxation exercises (Jallo et al., 2017). If the stress level of women with pregnancy can be reduced and their cortisol levels can be decreased by using relaxation-focused nursing care, uterine contraction severity may decrease, and gestational weeks may be extended. Thus, both maternal and fetus health can benefit from this positively.

This article was prepared to explain the relaxation-focused nursing care (RFNC) program that could be applied for women diagnosed with TPB and the possible effects of the program.

Relationship between Threatened Preterm Birth and Stress

Stress is known to be one of the important risk factors of TPB (Jallo et al., 2017; Schetter Dunkel, 2011; Leight et al., 2010). In the case of maternal stress, the secretion of adrenocorticotrophic hormone (ACTH) and corticotropin-releasing hormone (CRH) increases (Makrigiannakis et al., 2007). Increased CRH stimulates prostaglandin receptor A in the myometrium. Progesterone level decreases by suppressing prostaglandin receptor B, which

1. *The Body Follows the Mind: The Psycho-Physical Response Law*

For every proposition, thought, or emotion that a person has in mind, there is a corresponding physiological and chemical reaction within the body. Whatever the mind chooses to perceive correctly, the body reacts accordingly. If there are scary, negative birth images in the mind, the body unconsciously switches to a defensive state. In this case, the sympathetic nervous system is activated in the body as a physical reaction, and then tension occurs (Mongan, 2012). Therefore, reducing the fear and tension of women during birth is important. The sympathetic nervous system is suppressed and the parasympathetic nervous system is activated through practices to reduce fear and tension during birth. This results in increased oxytocin release. Circular and longitudinal muscles in the myometrium of the uterus work in harmony (Dick-Read, 2004). Thus, the fetus is advanced downwards while cervical dilatation occurs. Endorphin secretion increases in women who can achieve relaxation as this process progresses. Thus, the woman feels less pain. As a result, the delivery time is shortened (Mongan, 2012, Dick-Read, 2004). This principle is used in the RFNC model in TPB, but it is not for the initiation of birth but rather for delaying it. According to this principle, if the woman's stress is reduced and relaxation is achieved, the cortisol level of the woman is reduced and cervical dilatation and effacement are prevented. In this study conducted with this aim, cortisol levels of women who were administered RFNC were determined to be lower compared to women who were not administered the method (Ozberk, Mete & Bektas, 2019).

2. *The Power of Language: The Law of Harmonious Attraction and the Law of Repetition*

Words and propositions create a chain of emotions, beliefs, and reactions. This can be encouraging and supportive, but it can also have a negative affect altogether. Words cause thoughts in our minds. Repeating these thoughts in our minds creates emotions. Over time, these feelings become beliefs. These beliefs constitute behaviors. For this reason, Hypnobirthing Philosophy aims to create positive thoughts and emotions. Positive thoughts and emotions about birth help form positive behaviors about birth (Mongan, 2012). When a woman diagnosed with TPB uses a positive language thinking that her

baby is healthy and that her pregnancy will continue without problems, this, later, turns into a belief. This situation causes the woman to relax and the cortisol level to decrease (Ozberk, Mete & Bektas, 2019).

3. *What you want is what you get: The Law of Motivation*

Meanings attributed to birth by women can affect their birth processes. If women think they are sick, this may cause them to desist completely and fail to take part in the birth process. For this reason, it is important to increase the motivation of women for birth and to help them actively participate in the birth process (Mongan, 2012). If women believe that TPB will be delayed with the help of RFNC, their harmony with healthcare workers and their motivation to perform the practices increase. The pregnant group which was administered the model was determined to have increased satisfaction with the model and nursing intervention (Ozberk, Mete & Bektas, 2019).

Transactional Model

In the event of acute stress, the human body can develop a solution by rapidly reacting to the current threat or stimulus. On the other hand, chronic stress is a long-term problem. If the appropriate response to the current threat or stimulus cannot be developed, it remains unresolved (Latendresse, 2009). Diagnosis with risky pregnancy such as TPB in women causes acute stress (Simmons & Goldberg, 2011). Women are exposed to long-term stress due to uncertainties in TPB and concerns about the hospital itself and the health of the fetus (Jallo et al., 2017). Women need meeting their current stressor-related requirements to cope with stress in the TPB process. These needs include care during TPB, information about TPB, the health status of the infant, how the birth process will be, and what they will face when the baby is born (Ozberk, Mete & Bektas, 2019, Sawyer et al., 2013).

Coping with stress refers to an individual's efforts to reduce or endure the negative effects of a stressful experience (Lazarus & Folkman, 1987). The model considers stress as an interactive process between the individual and the environment. It divides the stress assessment process into two stages; primary and secondary assessment. The former assesses the stress, while the latter assess whether stress can be overcome.

After assessing the extent of threat or harm that stressor poses, whether it can be coped is assessed. Following this assessment (stress assessment), the individual chooses a “coping” method that is appropriate for themselves. The model has two types of coping methods, one of which is problem-oriented and the other emotion-oriented. Problem-oriented coping: This approach aims to change the source of stress. The individual tries to reduce the effect of stress by controlling the situation or their behaviors that cause stress. For this purpose, the individual first determines the problem and its cause, develops solution-oriented alternatives, and selects and applies the most appropriate one among them. Emotion-oriented coping: This stage helps to supervise the negative emotions resulting from the stressful situation and to direct them to a positive point. When individuals feel that the stressful situation cannot be controlled, they turn to these strategies to reduce or eliminate emotional tension (Lazarus & Folkman, 1984).

Threatened preterm birth is reported to increase stress in women (Hoffman et al., 2016; Schetter Dunkel, 2011). Therefore, the use of Lazarus and Folkman's (1984) Transactional model (Lazarus & Folkman, 1984) may be appropriate in dealing with stress in a stressful situation such as TPB. The nurse who will use this model should first determine the stress level of the pregnant woman with TPB using the primary assessment of stress. Subsequently, the secondary assessment evaluates the causes of stress, how damaging it is, and whether the individual can cope with stress. Eventually, the woman should decide which of the emotionally-oriented or problem-oriented coping methods to use.

Relaxation Exercises

Relaxation exercises help the body to relax and facilitate emotional relaxation by providing the transition to the parasympathetic nervous system, and physical relaxation. It is the relaxation of whole body muscles or certain muscles along with deep breathing exercises and the implementation of relaxation commands by people sitting and lying flat and comfortable accompanied by music. During relaxation exercises, normal blood pressure is maintained, oxygen consumption decreases, respiratory rate and pulse rate decrease, and muscles relax (Seers et al., 2008; Roykulcharoen & Good, 2004). In this way, the idea of relaxation is created by stimulating the cortex, and muscle relaxation

occurs (Seers et al., 2008; Hart, 2008; Kwekkeboom & Gretarsdottir, 2006).

Relaxation exercises include progressive muscle relaxation, breathing exercises, hypnosis, yoga, massage, biological feedback, meditation, imagination, attracting the attention in a different direction, listening to music, etc (Snyder & Wieland, 2003). In this program, endorphin massage, gradual deep relaxation, and deep relaxation exercises specific to TPB were used to provide relaxation to the woman with pregnancy.

1. Endorphin massage

Endorphin massage is a type of massage in which effleurage and vibration massage techniques are systematically applied to the back and lumbar and sacral regions (Mongan, 2012). Endorphin massage increases the release of endorphins in the body, helps to create a calm and comfortable feeling (Azelea, Vasra & Kadir., 2019), and provides muscle relaxation (Taghinejad, Delpisheh & Suhrabi, 2010).

2. Gradual deep relaxation

It is based on the idea that it is impossible to be tense in any part of the body where the muscles are completely relaxed. It usually involves loosening the various muscle groups that move the body from the head to the feet in a calm, quiet, and comfortable environment. In gradual deep relaxation, muscle relaxation occurs by eliminating tension by focusing on muscle groups.

Thus, normalization of blood flow to the muscles and decreased oxygen consumption, heart rate, breathing, and muscle activity, as well as increased alpha brain waves are provided (Sciencedirect, 2010).

3. Threatened preterm birth-Specific Deep Relaxation

Threatened preterm birth deep relaxation is applied in a calm, quiet, and comfortable environment, combined with progressive deep relaxation. It involves helping the woman with pregnancy to create a visual in her mind about herself and her baby to imagine a place, event and time in which she can feel calm, relaxed, and peaceful, and also involved adding music to the atmosphere to ensure relaxation.

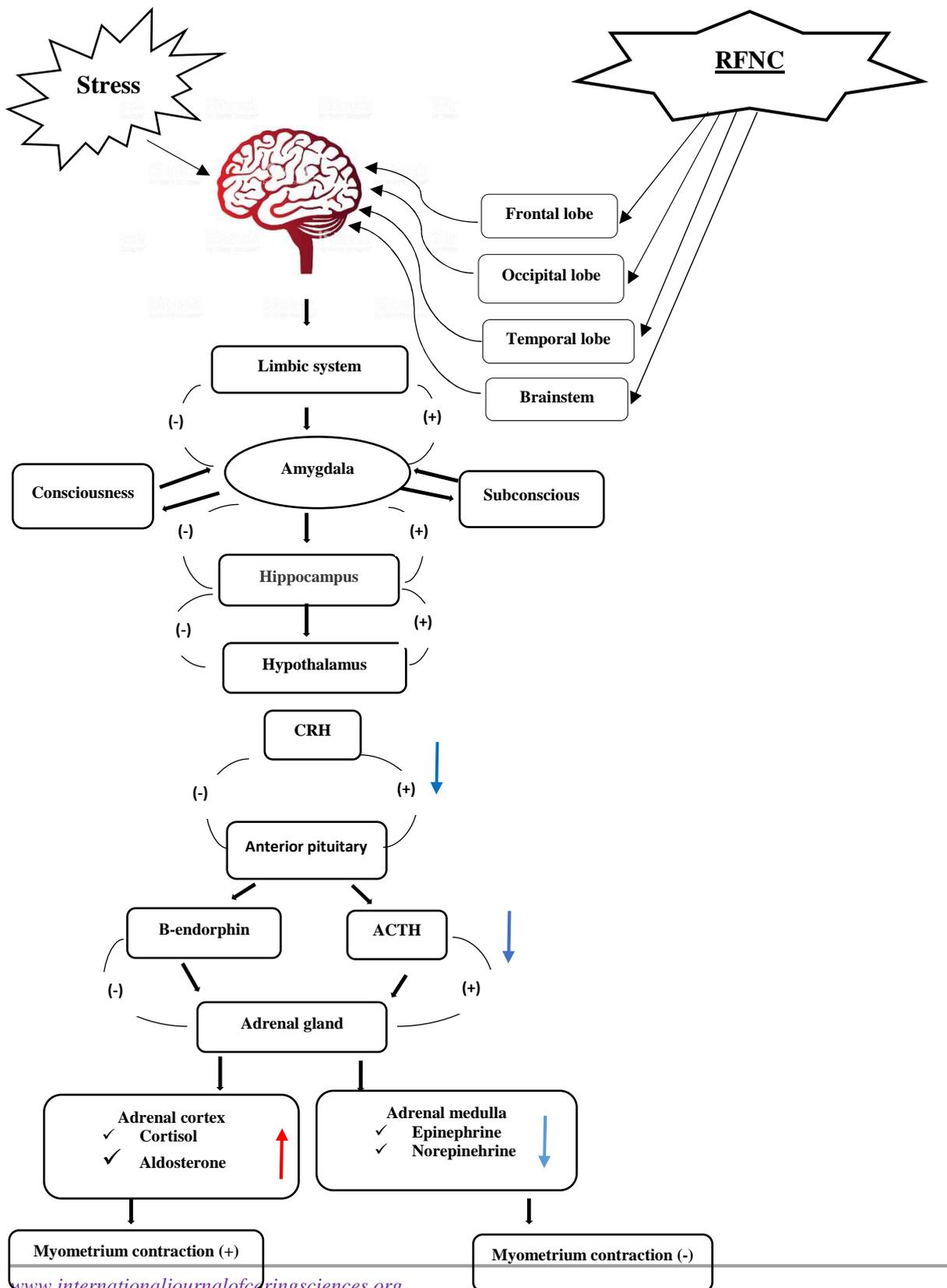
This relaxation exercise begins with breathing exercises and gradual relaxation. Then, the woman with pregnancy is relaxed through verbal

messages consisting of positive phrases and imagination which enables her to communicate with her baby. The sentences in this exercise focus completely on the comfort of the unborn

baby and it is important that there are no sentences related to birth.

Relaxation-Focused Nursing Care (RFNC)

Figure 2. Relaxation Focused Nursing Care Effect on Stress and TPB



Program in Threatened Preterm Birth

Figure 2 presents RFNC, and the use of RFNC in TPB is given in Table 1. The program employed here was scheduled for 16 hours in two days. The RFNC program uses three methods for the relaxation of the mother. The main goal of the program is to reduce maternal anxiety. The principles for reducing anxiety are as follows.

1. Meeting the information needs of the mother because the lack of knowledge will increase anxiety.

2. Direct or indirect stressors increase stress. Therefore, the second principle involves identifying the stressors of the mother and addressing them in order of priority. It also involves planning nursing interventions according to whether stressors are emotion-oriented or problem-oriented, making the mother accept stressors that cannot be changed and changing the ones that can be changed, empowering the mother to cope with stressors.

3. Using relaxation exercises to help the mother to relax.

Table 1. Use of RFNC in the Care of Pregnant Women with TPB

Aim		Philosophy in which it was formed	Nursing Initiative	Conclusion Outputs
MAKING A RELIABLE COMMUNICATION (1th day)	Starting positive communication (20 minutes)	HypnoBirthing and Transactional Model (Emotion and Problem Oriented Approach)	-Introduce yourself -Introduce physicians and nurses -Speak with a self confidence and calm tone -Set short sentences -Use touching with appropriate time and time according to the reactions of the pregnant when necessary.	1. Being calm 2. Peaceful facial expression 3. Asking questions 4. Ability to answer questions 5. Expressing that she feels good 6. Expressing that the nurse is positively affected by her approach 7. Communicating positively with the healthcare team 8. Deciding the meeting hours with the nurse together 9. Determining the hours of the interview (phone) with relatives 10. Expressing that she feels good
	Making her feel safe (20 minutes)		- Say you will support her during TPB - Encourage her to express herself - Encourage to ask the question - Explain everything that is done	
	Creating a positive hospital environment Disclosure of care principles to pregnant women (20 minutes)		- Introduce the hospital parts that the pregnant will use - Introduce the materials that the pregnant woman sees and will be used in her treatment. -Planning of meal, fluid intake and rest -Planning the program with the pregnant (planning the time of the interview, relaxation exercises, communication with the family relatives (phone call) times) -Giving contact information (phone and whatsapp)	
DETERMINING AND REDUCE THE	Determination of stressors and handling of priority stressors	HypnoBirthing and Transactional Model (Emotion and Problem Oriented	1.Determining their stressors through observation from the first encounter 2. Put the stressors in order of importance and determine the method of intervention according to the order of importance 3. Reducing stressors related to TPB	1. Expressing Stressors 2.Stressors evaluation 3. Expressing the way of thinking that can be changed 4. Deciding on the appropriate coping

(30 minutes)	Approach)	<p>What is TPB? What causes TPB? What are the symptoms of TPB? How is the diagnosis made in TPB? How is TPB treated? What are the effects of drugs taken in TPB? How long is the hospital stay in TPB? What is the mode of delivery in TPB? How is the health of the baby monitored in TPB?</p>	style
Breathing exercises and application of endorphin massage (15 minutes)	HypnoBirthing and Transactional Model (Emotion Oriented Approach)	<p>Breathing exercises -To teach breathing exercise techniques before the intensity and severity of contractions increase. -Applying the taught techniques together -Then, if there is any, make the breathing exercise between the contractions.</p> <p>Endorphine massage -Providing room and bed layout -Providing silence -Setting the ambient temperature -Explain the effect of endorphine massage -Getting permission for endorphine massage -Endorphine massage application -Teaching and applying endorphin massage, if any, to the accompanying person.</p>	<ol style="list-style-type: none"> 1. Relaxed facial expression 2. Being in a comfortable position 3. Make breathing exercises 4. Doing breathing exercises alone 5. Give positive feedback about endorphine massage
Creating positive thoughts, emotions and behavior (20 minutes)	HypnoBirthing and Transactional Model (Emotion Oriented Approach)	<ol style="list-style-type: none"> 1. Use positive language Avoid using all words that may negatively affect the perception of the pregnant woman. Choosing positive words; Use pressure word instead of pain word Use the word birth waves instead of pain 2. Describing the importance of using positive language as soon as possible For example: How do you hear your baby's heart sounds normally and how beautiful? 3. Establish encouraging and motivating sentences The number of contractions has decreased today 4. Asking the pregnant woman to use positive language 5. Ensuring that common messages are given to the pregnant by speaking with the team. 	<ol style="list-style-type: none"> 1. Ask a question 2. Responding to questions 3. Expressing that the nurse is positively affected by her approach 4. Expressing herself with positive words instead of negative words
To provide psychological and physiological	HypnoBirthing and Transactional Model	<p>Relaxation exercise -Providing room and bed layout -Providing silence -Setting the ambient temperature -To teach imagination exercise which</p>	<ol style="list-style-type: none"> 1. Comfortable appearing 2. Getting started with positive language 3. Establishing self-

	cal relaxation (20 minutes)	(Emotion Oriented Approach)	<p>is one of the relaxation techniques</p> <ul style="list-style-type: none"> -Focus on attention -Explanation of the technique of imaging -Using the relaxation breath taught to the pregnant woman -To make this exercise together by reading the relaxation text prepared for the pregnant -Getting the feedback of the pregnant after the relaxation is over -Performing relaxation exercises again in line with their feedback -Then wait for the pregnant woman to do this exercise by giving her time. -Doing encouraging and motivating sentences. For example; you feel more relaxed as you practice relaxation exercises. Let's continue with them. -Asking the pregnant woman to use positive language. 	<p>encouraging sentences</p> <ol style="list-style-type: none"> 4. Establishing positive sentences regarding the TPB process 5. Communicate positively with her baby 6. Make breathing exercises effective 7. Doing breathing exercises alone 8. Expressing relaxation with relaxation exercise
CONTINUING THE RELIABLE COMMUNICATION AND STRESS REDUCTION INITIATIVES (2nd days)	Maintaining positive communication (20 minutes)	HypnoBirthing and Transactional Model (Emotion and Problem Oriented Approach)	<ul style="list-style-type: none"> -Speaking in a calm, confident voice -Establish short sentences -Giving information about being contacted at any time (via phone and whatsapp) 	<ol style="list-style-type: none"> 1. Peaceful facial expression 2. Being willing to ask questions 3. Ability to answer questions 4. Expressing that she feels good 5. Expressing that she is positively affected by the nurse's approach
	Application of relaxation exercise (20 minutes)	HypnoBirthing and Transactional Model (Emotion Oriented Approach)	Relaxation exercise <ul style="list-style-type: none"> -Providing room and bed layout -Providing silence -Setting the ambient temperature -To teach gradual relaxation exercise which is one of the relaxation techniques -To make this exercise together by reading the relaxation text prepared for the pregnant -Getting the feedback after the relaxation is over -Then wait for the pregnant woman to do this exercise by giving her time. -Doing encouraging and motivating sentences. 	<ol style="list-style-type: none"> 1. Using positive language 2. Establishing self-encouraging sentences 3. Make positive sentences 4. Communicate positively with her baby 5. Expressing relaxation with relaxation exercise 6. Doing relaxation exercise on her own 7. Expressing her comfort
	Determination of existing stressors and addressing stressors going on from the previous day	HypnoBirthing and Transactional Model (Emotion and Problem Oriented Approach)	<ol style="list-style-type: none"> 1. Reducing stressors in TPB <p>How can I reduce my stress during the TPB process?</p> <p>What should be the relationship between my social support and support during the TPB process?</p> <p>How do I adapt to the hospital environment?</p> <p>What are my expectations about health professionals?</p> <p>What should I watch for in my diet?</p>	<ol style="list-style-type: none"> 1. Expressing coping resources for stressors 2. Willingness to learn about the coping ways expected from nurses

	(45 minutes)		<p>How can I maintain my hygiene? Will there be discharge at TPB, what should be considered? Can I breastfeed my baby if birth is early? What should I look for in the care of my baby if birth is early?</p> <ol style="list-style-type: none"> 2. Eliminate if the stressor can be removed 3. Supporting the pregnant woman to reduce / eliminate the stressor 4. Nurses' reduction / elimination of the stressor on behalf of the pregnant that the pregnant woman cannot do 5. If the stressor cannot be removed, its effect will be reduced. For this, either direct intervention to the stressor or indirect ways to reduce the effect of the stressor (relaxation exercises, etc.). 6. If the stressor cannot be removed, strengthening the pregnant woman to cope with this stressor. 7. Acceptance of the stressor and teaching her to live with her (providing social support until birth, etc.) 	
	Application of relaxation exercise (20 minutes)	HypnoBirthing and Transactional Model (Emotion Oriented Approach)	Relaxation exercise -Providing room and bed layout -Providing silence -Setting the ambient temperature -To teach relaxation exercise in TPB, which is one of the relaxation techniques for pregnant women. -To make this exercise together by reading the relaxation text prepared for the pregnant -Supporting the pregnant woman to do this exercise -Doing encouraging and motivating sentences.	<ol style="list-style-type: none"> 1. Comfortable appearing 2. Using positive language 3. Establishing self-encouraging sentences 4. Make positive sentences 5. Communicate positively with her baby 6. Doing breathing exercises alone 7. Expressing her comfort

Conclusion

Stress is known to be an important problem in the TPB process. Also, evidence levels of TPB treatment are thought to be insufficient. During the TPB process, women suffer from stress about primarily the health of the fetus, and birth, treatment process, hospital environment, health care personnel, and family and social support systems. During this process, the RFNC, which was prepared for reducing stress in women, will be effective in reducing uterine contractions by decreasing cortisol levels. Cortisol levels and stress levels were determined to be lower, and

satisfaction with gestational week and nursing care was higher in the RFNC program-administered group involving women diagnosed with TPB compared to the group in which the program was not applied (Ozberk, Mete & Bektas, 2019). It is recommended that nurses should use this program and that the program should be tested with research.

References

- American College of Obstetricians and Gynecologists (ACOG). (2016). Management of preterm labor. *Obstetrics and gynecology*, 128:e155–64.

- American Congress of Obstetricians and Gynecologists (ACOG). (2014). Preterm (Premature) Labor and Birth. www.acog.org/~media/.../faq087.pdf
- Aynioğlu O. (2014). Evaluation of demographic variables of mothers giving birth over 35 years of age. *Kocatepe Medical Journal*, 15(2):152-5.
- Azelea A, Vasra E & Kadir A. (2019). "The effect of endorphin message technique towards the decrease of pain at the first childbirth in BPM and Society Health Center Palembang" in The 1st Payung Negeri International Health Conference, KnE Life Sciences, pages 79–86.
- Blencowe H, Cousens S, Chou D, Oestergaard M, Say L, Moller A, et al. (2013). Born too Soon: the global epidemiology of 15 million preterm births. *Reproductive Health*, 10(Suppl 1):1–14.
- Blencowe H, Cousens S, Oestergaard MZ, Chou D, Moller AB, Narwal R, et al. (2012). National, regional, and worldwide estimates of preterm birth rates in the year 2010 with time trends since 1990 for selected countries: A systematic analysis and implications. *Lancet*, 379(9832):2162e72.
- Carty-Singleton S & Sciscione AC. (2014). Maternal activity restriction in pregnancy and the prevention of preterm birth: An evidence-based review. *Clinical Obstetrics and Gynecology*, 57(3):616±27.
- Coloma M, Kang F, Vallejo-Torres L, Díaz P, Méndez Y & Álvarez de la Rosa M. (2018). Economic consequences of over-diagnosis of threatened preterm labor. *International Journal of Gynecology & Obstetrics*, 141(2):200-205.
- Dick-Read G. (2004). Childbirth without fear. Pinter&Martin Ltd., London.
- Diego MA, Field T, Hernandez-Reif M, Schanberg S, Kuhn C & Gonzalez-Quintero VH. (2009). Prenatal depression restricts fetal growth. *Early human development*, 85:65–70.
- DiPietro JA, Hilton SC, Hawkins M, Costigan KA & Pressman EK. (2002). Maternal stress and affect influence fetal neurobehavioral development. *Developmental psychology*, 38(5):659-68.
- Dugoff L, Berghella V, Sehdev H, Mackeen Ad, Goetzl A & Ludmir J. (2018). Prevention of preterm birth with pessary in singletons (PoPPS): Randomized controlled trial. *Ultrasound in Obstetrics & Gynecology*, 51(5):573-579.
- FIGO (International Federation of Gynecology and Obstetrics). (2015). Best practice in maternal-fetal medicine. *International Journal of Gynecology & Obstetrics*, 128:80–82.
- Goldenberg RL, Culhane JF, Iams JD & Romero R. (2008). Epidemiology and causes of preterm birth. *Lancet*, 371(9606):75e84.
- Goya M, de la Calle M, Pratorcorona L, Merced L, Rodo C, Munoz B, et al. (2016). Cervical pessary to prevent preterm birth in women with twin gestation and sonographic short cervix: A multicenter randomized controlled trial (PECEP-Twins). *American Journal of Obstetrics & Gynecology*, 214:145–152.
- Goksever H, Kılıc B & Erata Y. (2008). Epidemiological Factors in Preterm Births. *Türkiye Klinikleri Gynecology Obstetrics*, 18(5):294-305.
- Hart J. (2008). Guided imagery. *Mary Ann Liebert*, 14(6), 295-299.
- Heinonen A, Gissler M, Riska A, Paavonen J, Tapper AM & Jakobsson M. (2013). Loop electrosurgical excision procedure and the risk for preterm delivery. *Obstetrics and gynecology*, 121(5):1063-8.
- Hermans FJR, Bruijn MMC, Vis JY, Wilms FF, Oudijk MA, Porath MM, et al. (2015). Risk stratification with cervical length and fetal fibronectin in women with threatened preterm labor before 34 weeks and not delivering within 7 days. *Acta Obstetrica et Gynecologica Scandinavica*, 94:715–721.
- Hoffman MC, Mazzoni SE, Wagner BD, Laudenslager ML & Ross RG. (2016). Measures of maternal stress and mood in relation to preterm birth. *Obstetrics and gynecology*, 127(3):545-52.
- Jallo N, Thacker LR, Menzies V, Stojanovic P & Svikis DS. (2017). A Stress coping app for hospitalized pregnant women at risk for preterm birth. *MCN: The American Journal of Maternal/Child Nursing*, 42(5):257-262.
- Janighorban M, Heidari Z, Dadkhah A & Mohammadi F. (2018). Women's needs on bed rest during high-risk pregnancy and postpartum period: A qualitative study. *Journal of Midwifery and Reproductive Health*, 6(3): 1327-1335.
- Kafkaslı A. (2014). Preterm Labor. *Türkiye Klinikleri Family Medicine*, 5(5):106-11.
- Karakash SD, Tschankoshvili N, Weedon J, Schwartz RM, Kirschbaum C & Minkoff H. (2016). Hypocortisolism and preterm birth. *Journal of Neonatal-Perinatal Medicine*, 9,333–339.
- Kistka ZA, Palomar L, Lee KA, Boslaugh SE, Wangler MF, Cole FS, et al. (2007). Racial disparity in the frequency of recurrence of preterm birth. *American Journal of Obstetrics & Gynecology*, 196(2):131.e1-6.
- Kwekkeboom KL & Gretarsdottir E. (2006). Systematic review of relaxation interventions for pain. *Journal of Nursing Scholarship*, 38:3,269-277.
- Latendresse G. (2009). The interaction between chronic stress and pregnancy: Preterm birth from a biobehavioral perspective. *Journal of Midwifery & Women's Health*, 54(1):8–17.
- Lawn JE, Gravett MG, Nunes TM, Rubens CE & Stanton E. (2010). Global report on preterm birth and stillbirth (1 of 7): definitions, description of the burden and opportunities to improve data. *BMC Pregnancy and Childbirth*, 23;10 Suppl 1:S1.

- Lazarus RS & Folkman S. (1984). Stress, Appraisal, and Coping, New York: Springer.
- Lazarus RS & Folkman S. (1987). Transactional theory and research on emotions and coping. *European Journal of Personality*, 1,141–169.
- Leight KL, Fitelson EM, Weston CA & Wisner KL. (2010). Childbirth and mental disorders. *International Review of Psychiatry*, 22(5):453-71.
- Levine A, Zagoory-Sharon O, Feldman R, Lewis JG & Weller A. (2007). Measuring cortisol in human psychobiological studies. *Physiology and Behavior*, 90,43-53.
- Lucovnik M, Chambliss LR & Garfield RE. (2013). Costs of unnecessary admissions and treatments for "threatened preterm labor". *American Journal of Obstetrics & Gynecology*, 209(3):217.e1-3.
- Maia MC, Nomura R, Mendonca F, Rios L & Moron A. (2019). Is cervical length evaluated by transvaginal ultrasonography helpful in detecting true preterm labor? *The Journal of Maternal-Fetal & Neonatal Medicine*, 22:1-7.
- Makrigiannakis A, Semmler M, Briese V, Eckerle H, Minas V, Mylonas I, et al. (2007). Maternal serum corticotropin-releasing hormone and ACTH levels as predictive markers of premature labor. *International Journal of Gynecology & Obstetrics*, 97(2),115-9.
- Maloni JA. (2010). Antepartum bed rest for pregnancy complications: Efficacy and safety for preventing preterm birth. *Biological Research for Nursing*, 12(2),106-124.
- Mongan MF. (2012). *HypnoBirthing, Mongan method*. Gün Publishing, Istanbul, Turkey.
- NICE (The National Institute for Health and Clinical Excellence). (2015). Preterm labour and birth. <https://www.nice.org.uk/guidance/ng25/resources/preterm-labour-and-birth-pdf-1837333576645>
- Nour NM. (2012). Premature delivery and the millennium development goal. *Reviews in Obstetrics & Gynecology*, 5(2):100–105.
- Oliveira DC & Mandu ENT. (2015). Women with high-risk pregnancy: Experiences and perceptions of needs and care. *Escola Anna Nery*, 19(1):93-101.
- Ozberk H, Mete S & Bektas M. (2019). The effect of nursing care on stress, prenatal adaptation, contraction, cortisol and birth week in threat of preterm birth [dissertation]. Izmir, Turkey.
- Pohlmann FC, Kerber NPC, Viana JS, Carvalho VF, Costa CC & Souza CS. (2016). Premature birth: Approaches presents in national and international scientific production. *Enfermería Global*, 42:410-423.
- Roberts D, Brown J, Medley N & Dalziel SR. (2017). Antenatal corticosteroids for accelerating fetal lung maturation for women at risk of preterm birth. *Cochrane Database Systematic Reviews*, 21;3:CD004454.
- Rodrigues PB, Zambaldi CF, Cantilino A & Sougey EB. (2016). Special features of high-risk pregnancies as factors in development of mental distress: A review. *Trends Psychiatry Psychother*, 38(3):136-140.
- Romero R, Nicolaides KH, Conde-Agudelo A, O'Brien JM, Cetingoz E, Da Fonseca E, et al. (2016). Vaginal progesterone decreases preterm birth \leq 34 weeks of gestation in women with a singleton pregnancy and a short cervix: An updated meta-analysis including data from the OPPTIMUM study. *Ultrasound in Obstetrics & Gynecology*, 48(3):308-17.
- Roykulcharoen V & Good M. (2004). Systematic relaxation to relieve postoperative pain. *Journal of Advanced Nursing*, 48(2):140-8.
- Rubarth LB, Schoening AM, Cosimano A & Sandhurst H. (2012). Women's experience of hospitalized bed rest during high-risk pregnancy. *Journal of Obstetric, Gynecologic & Neonatal Nursing*, 41(3):398-407.
- Sawyer A, Rabe H, Abbott J, Gyte G, Duley L & Ayers S. (2013). Parents' experiences and satisfaction with care during the birth of their very preterm baby: A qualitative study. *BJOG: An International Journal of Obstetrics & Gynaecology*, 120,637–643.
- Schetter Dunkel C. (2011). Psychological science on pregnancy: Stress processes, biopsychosocial models, and emerging research issues. *Annual Review of Psychology*, 62:531-58.
- Schoen CN, Tabbah S, Iams JD, Caughey AB & Berghella V. (2015). Why the United States preterm birth rate is declining. *American Journal of Obstetrics & Gynecology*, 213(2):175-80.
- Sciencedirect. (2010). Progressive Muscle Relaxation. <https://www.sciencedirect.com/topics/medicine-and-dentistry/progressive-muscle-relaxation/pdf>
- Seers K, Crichton N, Tutton E, Smith L & Saunders T. (2008). Effectiveness of relaxation for postoperative pain and anxiety: Randomized controlled trial. *Journal of Advanced Nursing*, 62(6):681-8.
- Simmons HA & Goldberg LS. (2011). "High-risk" pregnancy after perinatal loss: understanding the label. *Midwifery*, 27(4):452-7.
- Snyder M & Wieland J. (2003). Complementary and alternative therapies: What is their place in the management of chronic pain? *The Nursing clinics of North America*, 38:495-508.
- Sosa CG, Althabe F, Belizán JM & Bergel E. (2015). Bed rest in singleton pregnancies for preventing preterm birth. *Cochrane Database Systematic Reviews*, 30;(3):CD003581.
- Stan C, Boulvain M, Pfister R & Hirsbrunner-Almagbaly P. (2013). Hydration for treatment of preterm labour. http://www.cochrane.org/CD003096/PREG_hydration-for-treatment-of-preterm-labour
- Taghinejad H, Delpisheh A & Suhrabi Z. (2010). Comparison between massage and music therapies

- to relieve the severity of labor pain. *Women's Health*, 6(3), 377–381.
- Taner CE & Ekin A. (2014). Definition, classification and significance of preterm birth. *Turkiye Klinikleri Gynecology Obstetrics*, 7(1):1-4.
- Tsikouras P, Anastasopoulos G, Maroulis V, Bothou A, Chalkidou A, Deuteraiou D, et al. (2018). Comparative evaluation of arabin pessary and cervical cerclage for the prevention of preterm labor in asymptomatic women with high risk factors. *International Journal of Environmental Research and Public Health*, 18;15(4).
- Turkey's Health Ministry. (2017). [Health Statistics Yearbook. <https://www.saglik.gov.tr/TR,52696/saglik-istatistikleri-yilligi-2017-yayinlanmistir.html>
- Ville Y & Rozenberg P. (2018). Predictors of preterm birth. *Best Practice & Research: Clinical Obstetrics & Gynaecology*, 23-32. 52:23-32.
- Wagner P, Sonek J, Heidemeyer M, Schmid M, Abele H, Hoopmann M, et al. (2016). Repeat measurement of cervical length in women with threatened preterm labor. *Geburtshilfe Frauenheilkd*, 76(7): 779–784.
- Weinstock M. (2008). The long-term behavioural consequences of prenatal stress. *Neuroscience & Biobehavioral Reviews*, 32(6),1073-86.
- World Health Organization (WHO). (2014). Preterm birth. <http://www.who.int/mediacentre/factsheets/fs363/en/>