

IMPLEMENTATION OF HYPNOBIRTHING METHOD TO PREVENT PARTUS PREMATURUS IMMINENS IN FACTORY WORKER MOTHERS

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Abstract

Partus prematurus imminens (PPI) is a high risk for pregnant women working in factories, with stress and physical workload as the main factors. This study aims to evaluate the effectiveness of hypnobirthing method in reducing the risk of PPI in factory working mothers. Using a descriptive design and quasi-experiment, the subjects consisted of pregnant women working in factories in Sidoarjo. Hypnobirthing intervention was given to the experimental group, while the control group only received standard care. The results showed that hypnobirthing decreased stress levels, and significantly reduced cervical contractions and opening. These findings indicate that hypnobirthing has the potential to be an effective non-pharmacological prevention method for IOP, with a positive impact on maternal mental and physical health. The implication of this study is the need for integration of hypnobirthing in maternal health services, especially for mothers who work in sectors with high physical load.

INTRODUCTION

Partus prematurus imminent (PPI) is a threat to pregnancy where there are signs of labor at term (20 weeks – less than 37 weeks) and the baby's birth weight is less than 2500 grams. *Partus prematurus imminent* (PPI) is a high-risk complication in pregnancy that not only adversely affects the health of the pregnant woman, but can also cause impacts on the baby including neonatal death, *cerebral palsy*, cognitive impairment, blindness, deafness, respiratory disease, and neonatal complications (Nie C *et al*, 2017).

Mechanisms of preterm labor include a condition where there is a deficiency of the choriodecidual enzyme 15-OH-PGDH, which is responsible for prostaglandin degradation, causing an increase in PGE2 concentration that reaches the myometrium and triggers contractions. Genital infections affecting the decidua/amniochorion cause a maternal or fetal inflammatory response. Activated macrophages and granulocytes release inflammatory mediators such as cytokines, (IL-1, IL-6 and TNF α), *matrix metallo* proteinases/MMPs (collagenase, gelatinase, stromelysin) and products of lipooxygenase and cyclooxygenase pathways. Infection leads to decreased levels of the enzyme 15-OH-PDGH which aids preterm labor. All these mediators ultimately result in premature rupture of membranes and the normal

birth cascade leading to preterm labor. Contractions and the presence of cervical opening before week 37 is one of the signs of preterm labor (Kota *et al.*, 2013).

Preterm birth complications are the leading cause of death in children under 5 years of age, causing an estimated 1 million deaths in 2015. In 184 countries, preterm birth rates range from 5% to 18% of babies born. In 2015, the preterm delivery rate in the United States was 9.62% among 3,977,745 births which translates to a significant number of neonates requiring further medical care. More than 60% of preterm births occur in Africa and South Asia. In low-income countries, an average of 12% of babies are born too early compared to 9% in high-income countries. The ten countries with the largest number of preterm births are India, China, Nigeria, Pakistan, Indonesia, United States, Bangladesh, Philippines, Democratic Republic of Congo, and Brazil. The ten countries with the highest preterm birth rates per 100 live births are Malawi, Comoros, Congo, Zimbabwe, Equatorial Guinea, Mozambique, Gabon, Pakistan, Indonesia and Mauritania (Hamilton *et al.*, 2016; WHO, 2018).

The incidence and mortality rate of preterm infants in Indonesia is still relatively high. Indonesia is ranked in the top 10 of 184 countries with a high incidence of premature births, which is 15.5 premature births per 100 live births. In terms of the number of babies born prematurely, Indonesia is the fifth country with the highest number of premature babies in the world, amounting to 675,700 babies (WHO, 2014). In terms of the number of deaths, Indonesia is ranked 7th out of 10 countries with a high number of premature under-five deaths, amounting to 25,800 deaths (UCFS, 2014). In 2018, Sidoarjo Regency had an infant mortality rate of 6.27 per 1,000 live births, with 60% due to prematurity (Sidoarjo Health Profile 2018).

Based on the results of research at Sanglah Denpasar Hospital, the prevalence of PPI was 4.1%. Most PPI patients were between 20-35 years old at 76.19%, although age is not a risk factor but many other factors are influential. The highest occupation of PPI patients was housewives at 45.24% and the lowest was students at 2.39%, heavy work and exhausting work conditions can increase the risk of preterm birth. Most PPI patients are nulliparity (64.29%), because the pregnancy that occurs in nulliparity patients is the patient's first pregnancy so that the lack of experience, readiness, and knowledge in dealing with pregnancy and how to maintain pregnancy. This can lead to several pregnancy complications such as premature rupture of membranes, infection, and stress during pregnancy so that PPI can occur (Widiana, 2019).

Preterm birth cannot be separated from various influencing factors. Many factors contribute to the occurrence of preterm birth. These include lifestyle factors such as late or no prenatal check-ups, smoking, drinking alcohol, drug use, domestic violence (including physical, sexual, or emotional abuse), lack of social support, high stress, and work that requires long standing times. Various medical conditions can also cause preterm labor, namely pelvic inflammatory disease, sexually transmitted diseases, urinary tract infections, high blood pressure, diabetes, blood clotting disorders, *underweight* or *overweight* before pregnancy, too close a gap between pregnancies, abnormalities in the baby, vaginal bleeding, weak cervix, premature rupture of membranes, previous history of preterm labor, uterine abnormalities, malnutrition, pregnancy at the age of > 35 years or < 19 years, pregnancy at the age of > 35 years or < 19 years, pregnancy at the age of > 35 years or < 19 years, pregnancy at the age of > 35 years or < 19 years of age, twin, triplet or more pregnancies, and uterine or cervical abnormalities, can also increase the risk of preterm birth (Trihono *et al.*, 2013).

The results of the study obtained socio-demographic data of women, older couples have more life experience and coping skills to face challenges such as *Partus Prematurus Imminens* (PPI). Couples with high socioeconomic status will have a positive perception of themselves compared to couples with low socioeconomic status. Research shows the depression rate of

PPI women is 27.7% for women with high family support and 50% for women with low family support. Found exclusively in PPI women, social support was positively associated with resilience, active coping, and positive affect, and negatively associated with distress, passive coping, negative affect, and depression (Nie C *et al*, 2017).

According to the Central Bureau of Statistics in 2012, out of 112 million workers in Indonesia, 43 million of them are women. The number of female workers in the industry is very high. In Jakarta there are about 80,000 factory workers, 90 percent of whom are women and 80 percent of female manufacturing workers are only elementary school graduates (Purba, *et al.*, 2016). Sidoarjo Regency is known as the city of SMEs. Currently Sidoarjo Regency has 171,264 Micro Business Units. Sidoarjo has an industrial district with 2,635 large, medium and small companies including *home industries* that involve many women workers. Sidoarjo is also the largest SME district in Indonesia in 2015. Most of the working population in Sidoarjo district are laborers/employees, 66.24 percent. Female factory workers in Sidoarjo Regency amounted to 36.21% (Fauziah, *et al.*, 2017, BPS 2018).

The results of research in 2014 showed that 54.8% of laboring mothers at Sidoarjo Regional Hospital had a heavy workload. The results showed there was a relationship between the workload of pregnant women with the incidence of preterm labor with $p\text{ value} = 0.008$ ($P < 0.05$). Pregnant women with heavy workloads are caused by having a job with a shift work system, long working hours >7 hours/day or >49 hours/week, working in a factory with an average break time of 1 hour and activities such as lifting or pushing goods. In addition, after working outside the home, mothers still do household chores such as cooking, sweeping, washing without the help of others. The reason why mothers work on average is to help the family economy (Rinata, 2014).

Research in Bangladesh found that factory work in the garment industry is physically demanding and stressful for women workers who have long working hours, live with the constant fear of dismissal and significant family and community demands on their time at home. During pregnancy, their vulnerability to problems increases. It is further revealed that pregnant workers in factories work in one position or standing for long periods of time with limited or no breaks. Several studies have found that physically demanding jobs with long standing and long working hours can increase catecholamine levels and patients who have high catecholamine levels suffer from pre-eclampsia or hypertensive disorders (Akhter S, *et al.*, 2017).

Pregnant factory workers reported that they felt work-related stress and panic about losing their jobs if they could not meet production quotas due to pregnancy. They do not get enough rest or sleep. The factory doctors reported that pregnant women develop hypertensive disorders due to the nature of their work such as working long hours in one position, and that work-related stress can cause hypertensive disorders during pregnancy (Akhter S, *et al.*, 2017).

Stress in humans can occur acutely and chronically, acute stress is related to immediate, immediate danger that stimulates a sympathetic nervous system counter-response. Biochemical variations play an important role in influencing changes in neurophysiological reactions to stress in adults and children. These chemical changes may result in psychosomatic disorders. Most of the neuro-biochemical variations associated with stress are a consequence of stimulation of the sympathetic nervous system, specifically: the fight-or-flight response. In acute stress, this response triggers the release of substances as catecholamines, which include epinephrine, norepinephrine (NE) and cortisol, from the adrenal glands. A number of neurotransmitters, neuropeptides and hormones have been associated with long-term psychiatric outcomes in psychosomatic disorders (Satsangi and Brugnoli, 2018)..

In terms of psychological factors, many studies have linked cortisol to stress, anxiety and mood in pregnancy. In particular, higher pregnancy anxiety has been associated with a sharper increase in cortisol trajectory during pregnancy. Based on these findings, we found that the higher cortisol observed in women pregnant for the first time (primiparous) versus those who had previously given birth (multiparous) during pregnancy was partially mediated by higher pregnancy-specific anxiety among primiparous women (Gillespie *et al.*, 2017).

Hypnosis is a procedure involving cognitive processes (such as imagination) in which the subject is guided by the hypnotist to respond to suggestions for changes in sensations, perceptions, thoughts, feelings, and behavior. *Hypnosis* can alter and eliminate the psychological experience of pain and also the neurophysiological processes of pain in the brain. Medical *hypnotherapy* includes teaching patients to enter a trance state of self-awareness, focused attention, selective wakefulness, and reinforced suggestion for specific purposes such as relaxation, pain or anxiety, or relief of psychological symptoms. (Satsangi and Brugnoli, 2018).

Hypnobirthing is a form of *hypnotherapy* known to have a very important role in the prevention of preterm labor. The cause of preterm labor of infants is generally due to pregnancies complicated by higher levels of psychosocial stress. *Hypnobirthing* combined with conventional pharmacological therapy can significantly extend the duration of pregnancies threatened by preterm labor, which is an average of 18.8% longer than patients treated with medication alone (Brown, 2007).

Some of the things that influence *hypnobirthing* can extend the duration of the gestational length of preterm labor imminence include first, the patient learns to control stress in the psychosocial changes of pregnancy. Secondly, *hypnobirthing* can be used to teach patients to be more aware of contractions, and therefore start pharmacological therapy at an earlier and more effective point in pregnancy. Thirdly, the relaxing effect of *hypnobirthing* not only makes the tolerance of pharmacological therapies that work to relax the uterine muscles, directly reducing the chances of preterm labor. *Hypnobirthing* can also increase the patient's motivation to continue the pregnancy to completion through increased self-efficacy. The extra attention and social support given to patients taught *hypnobirthing* may also contribute to a decrease in the incidence of prematurity (Brown, 2007).

Hypnobirthing helps to relax the uterine muscles and improve placental circulation and cope with psychosocial stress during pregnancy, it will be able to produce a good outcome. Clinical *hypnobirthing* is a method that intentionally induces a hypnotic state in patients through verbal guidance, and utilizes its properties and characteristics for targeted therapeutic purposes. It appears that the increased suggestibility in this altered state of consciousness provides an opportunity to change a mother's behavioral patterns and emotions regarding childbirth (Shah *et al.*, 2011).

The novelty in this study is that *hypnobirthing* has not been widely applied to the prevention of *partus prematurus imminens* by measuring stress levels in working mothers as well as the presence of contractions and the threat of cervical opening. This research is needed because of the need to prevent the incidence of partus prematurus, so that the application of *hypnobirthing* in cases of *partus prematurus imminens* can be used as a prevention effort. The novelty in sociodemographic factors in this study is that it is focused on sociodemographic factors in working mothers in factories that are associated with the prevention of *partus prematurus imminens* through the provision of *hypnobirthing*.

This study aims to evaluate the effect of hypnobirthing in the prevention of partus prematurus imminens through reducing stress levels and other physiological aspects in factory worker mothers. The sub-formulation of the problem includes analyzing differences in stress

levels, cervical opening and uterine contractions before and after hypnobirthing, as well as the impact of sociodemographics in the prevention of preterm labor. The results of this study are expected to have academic benefits in understanding the relationship between hypnobirthing and prevention of preterm labor, practical benefits in improving the quality of maternal care in Sidoarjo Regency, and social benefits in providing comfort and reducing maternal stress, thus supporting maternal and infant health and reducing morbidity and mortality.

RESEARCH METHODS

This study used two types of designs, namely descriptive and quasi-experiment, to evaluate the effect of hypnobirthing on the prevention of partus prematurus imminens (PPI) in factory worker mothers. The study was conducted at Bhayangkara Porong Hospital and Siti Hajar Sidoarjo Hospital, for six months in 2023.

This research design is divided into two types, first using descriptive analysis by screening pregnant women factory workers at risk of PPI using an initial questionnaire. The second uses a quasi-experiment, using a non-equivalent control group design without randomization to measure the effect of hypnobirthing. The experimental group received hypnobirthing and standard treatment, while the control group only received standard treatment.

Population and Sample

The population included factory worker mothers with IOP in the two hospitals. The sample, purposively selected, included participants who met the inclusion criteria such as PPI without other complications. The sample size was determined by power analysis, resulting in 33 participants in each group.

Research Procedure

Hypnobirthing was performed by certified experts to reduce stress levels, measured through PHQ-9. Uterine contractions using NST, and cervical opening by routine examination.

Respondents were given informed consent, then selected to the experimental or control group. Furthermore, contractions, and cervical opening were measured before and after hypnobirthing in the experimental group. The COVID-19 health protocol was followed. The study followed the principles of beneficence, non-maleficence, autonomy, anonymity, veracity and justice, ensuring safety, honesty and equality for all respondents.

Data Analysis

Data analysis in this study included three main stages: univariate analysis to describe variables with frequency distribution, mean, and standard deviation; bivariate analysis using the Kolmogorov-Smirnov test to check data normality, followed by parametric or non-parametric statistical tests according to data distribution; and multivariate analysis with regression tests to determine the effect of hypnobirthing on preventing partus prematurus imminens (PPI), including sociodemographic variables, uterine contractions, cervical opening, and stress levels.

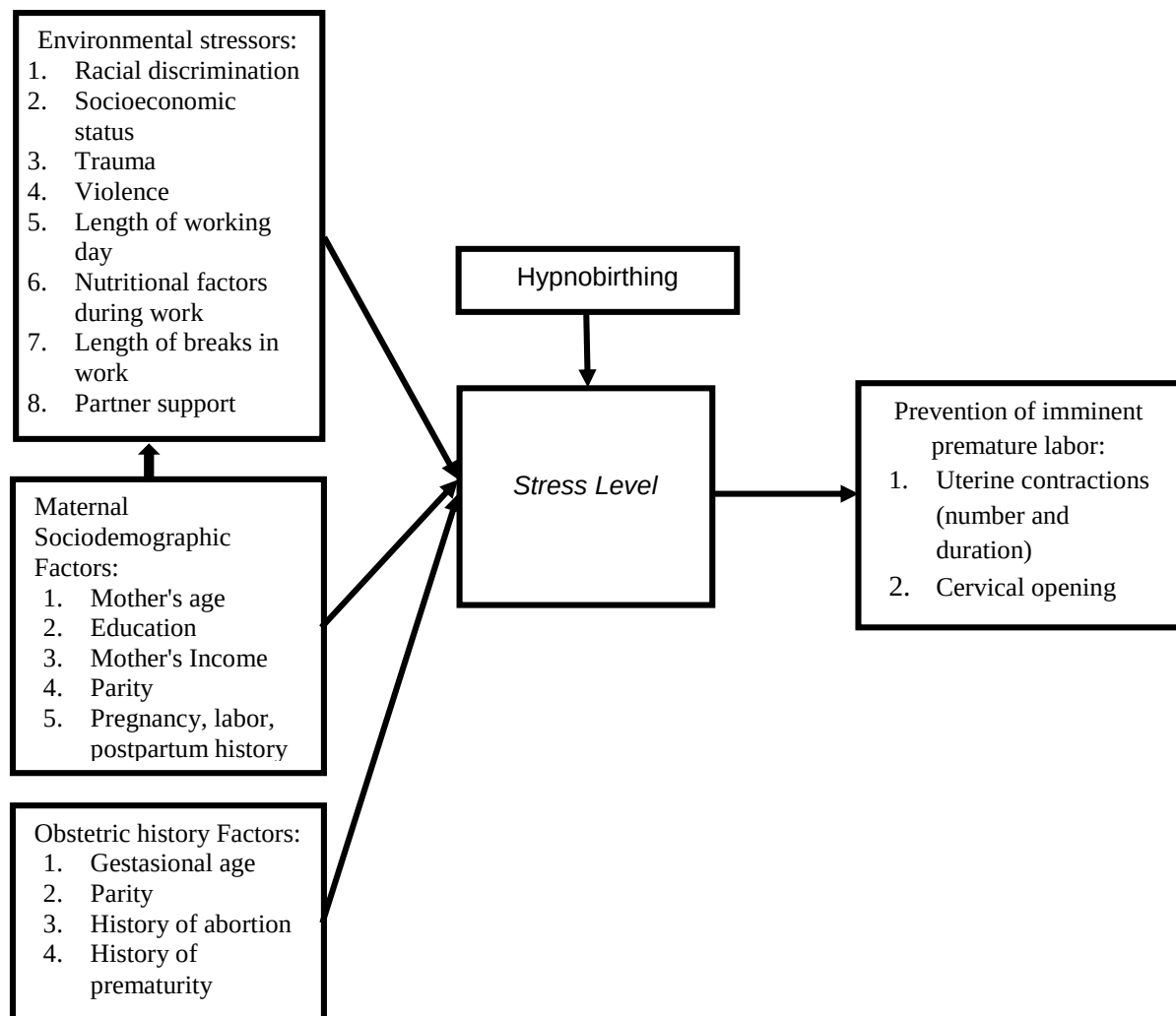


Figure 1. Conceptual Framework for the Implementation of Hypnobirthing to Prevent Partus Prematurus Imminens through Reducing Stress Levels in Factory Worker Mothers

RESULT AND DISCUSSION

Normality Test

Before conducting the analysis test, a data normality test is carried out to determine the statistical test to be used. The following will show the normality test using the Kolmogorov Smirnov test on each variable.

Table 1. Variable Normality Test Results

Variables	ρ value	Description
Stress level	0,043	Abnormal
Opening	0,000	Abnormal
Number of contractions	0,001	Abnormal
Duration of contraction	0,002	Abnormal

Based on table 1, the value on all variables is <0.05 , which means that all data is not normally distributed, so it cannot use parametric statistical tests. The statistical test used is a non-parametric test, in this study using the Friedman statistical test because it tests numerical comparative hypotheses with non-normal distribution and more than two paired groups.

Comparison of Stress Levels of Factory Worker Mothers in the Treatment Group, Control Group with Stress and Control Group without Stress Before and After

To determine the comparison of stress levels of factory worker mothers in the treatment group, control group with stress and control group without stress using the Friedman Test.

Table 2. Friedman Test Analysis Results Comparison of Stress Levels in Three Groups

Group	n	Before	After	p value
		Median (Minimum-Maksimum)	Median (Minimum-Maksimum)	
Hypnobirthing with stress	33	13 (10-15)	7 (5-8)	0,000
Non-Hypnobirthing with stress	33	13 (10-15)	10 (9-14)	
Non-Hypnobirthing without stress	33	5 (1-9)	4 (1-9)	

Wilcoxon Post Hoc Test: Comparison of stress levels in hypnobirthing and non hypnobirthing groups with stress $p = 0.000$; hypnobirthing and non hypnobirthing groups without stress $p = 0.000$; non hypnobirthing groups with stress and non hypnobirthing without stress $p = 0.000$.

Based on table 2, the results of the Friedman test showed that the value of $p = 0.000$, which can be concluded that there is a significant measurement of stress levels in both groups. The table shows that in each group there is a decrease in stress levels after treatment, but there is a significant decrease in the hypnobirthing group, which is 6 points.

To determine the difference between the three groups, Wilcoxon post hoc test was conducted. Based on the Wilcoxon post hoc test, the value $p = 0.000$ was obtained for the comparison of all groups before and after treatment. The conclusion that can be drawn on post hoc Wilcoxon is:

1. The level of stress in the hypnobirthing group is different from the non-hypnobirthing group with stress.
2. The stress level in the hypnobirthing group was different from the non-hypnobirthing group without stress.
3. The level of stress in the non-hypnobirthing group with stress is different from the non-hypnobirthing group without stress.

Comparison of the Number of Uterine Contractions in the Treatment Group, Control Group With Stress and Control Group Without Stress Before and After

Table 3. Friedman Test Analysis Results Comparison of the Number of Uterine Contractions in Three Groups

Group	n	Before	After	p value
		Median (Minimum-Maksimum)	Median (Minimum-Maksimum)	

		(amount in 20 minutes)	(amount in 20 minutes)	
Hypnobirthing with stress	33	5 (3-6)	1 (1-2)	0,000
Non-Hypnobirthing with stress	33	5 (3-6)	3 (1-5)	
Non-Hypnobirthing without stress	33	5 (2-6)	2 (1-5)	

Wilcoxon Post Hoc Test: Comparison of the number of uterine contractions in hypnobirthing and non-hypnobirthing groups with stress $p = 0.000$; hypnobirthing and non-hypnobirthing groups without stress $p = 0.000$; non-hypnobirthing groups with stress and non-hypnobirthing without stress $p = 0.000$.

Based on table 3, the results of the Friedman test showed that the value of $p = 0.000$, which can be concluded that there is a significant measurement of the number of uterine contractions in both groups. The table shows that in each group there is a decrease in the number of contractions after treatment, but there is a significant decrease in the hypnobirthing group.

To determine the difference between the three groups, Wilcoxon post hoc test was conducted. Based on the Wilcoxon post hoc test, the value $p = 0.000$ was obtained for the comparison of all groups before and after treatment. The conclusion that can be drawn on post hoc Wilcoxon is:

1. The number of uterine contractions in the hypnobirthing group was different from the non-hypnobirthing group with stress.
2. The number of uterine contractions in the hypnobirthing group was different from the non-hypnobirthing group without stress.
3. The number of uterine contractions in the non-hypnobirthing group with stress is different from the non-hypnobirthing group without stress.

Comparison of Duration of Uterine Contractions in the Treatment Group, Control Group With Stress and Control Group Without Stress Before and After

Table 4. Friedman Test Analysis Results Comparison of Duration of Uterine Contractions in Three Groups

Group	n	Before	After	p value
		Median (Minimum-Maksimum) (second)	Median (Minimum-Maksimum) (second)	
Hypnobirthing with stress	33	30 (15-50)	10 (5-10)	0,000
Non-Hypnobirthing with stress	33	30 (15-50)	20 (10-35)	
Non-Hypnobirthing without stress	33	20 (15-50)	10 (10-40)	

Wilcoxon Post Hoc Test: Comparison of the duration of uterine contractions in hypnobirthing and non-hypnobirthing groups with stress $p = 0.000$; hypnobirthing and non-hypnobirthing groups without stress $p = 0.000$; non-hypnobirthing groups with stress and non-hypnobirthing without stress $p = 0.000$.

Based on table 4, the results of the Friedman test showed that the value of $p = 0.000$, which can be concluded that there is a significant measurement of the length of uterine

contractions in both groups. The table shows that in each group there is a decrease in the length of contractions after treatment, but there is a significant decrease in the hypnobirthing group. Although in the control group without stress and hypnobirthing after treatment is almost the same, but before treatment the length is more in the hypnobirthing group.

To determine the difference between the three groups, Wilcoxon post hoc test was conducted. Based on the Wilcoxon post hoc test, the value $p = 0.000$ was obtained for the comparison of all groups before and after treatment. The conclusion that can be drawn on post hoc Wilcoxon is:

1. The duration of uterine contractions in the hypnobirthing group was different from the non-hypnobirthing group with stress.
2. The duration of uterine contractions in the hypnobirthing group was different from the non-hypnobirthing group without stress.
3. The duration of uterine contractions in the non-hypnobirthing group with stress is different from the non-hypnobirthing group without stress.

Comparison of Uterine Cervical Opening in the Treatment Group, the Control Group with Stress and the Control Group without Stress Before and After

Table 5. Friedman Test Analysis Results Comparison of Uterine Cervical Opening in Three Groups

Group	n	Before	After	p value
		Median (Minimum-Maksimum) (cm)	Median (Minimum-Maksimum) (cm)	
Hypnobirthing with stress	33	0 (0-1)	0 (0-4)	0,005
Non-Hypnobirthing with stress	33	0 (0-1)	0 (0-5)	0,025
Non-Hypnobirthing without stress	33	0 (0-1)	0 (0-3)	0,008

Wilcoxon Post Hoc Test: Comparison of uterine cervical opening in hypnobirthing and non hypnobirthing groups with stress $p = 0.011$; hypnobirthing and non hypnobirthing groups without stress $p = 0.041$; non hypnobirthing groups with stress and non hypnobirthing without stress $p = 0.016$.

Based on table 5, the results of the Friedman test showed that the value $p < 0.05$, which can be concluded that there is a significant measurement of uterine cervical opening in both groups. To determine the difference between the three groups, the Wilcoxon post hoc test was conducted. Based on the Wilcoxon post hoc test, the value $p < 0.05$ was obtained for the comparison of all groups before and after treatment. The conclusion that can be drawn on post hoc Wilcoxon is:

1. The opening of the uterine cervix in the hypnobirthing group was different from the non-hypnobirthing group with stress.
2. The opening of the uterine cervix in the hypnobirthing group was different from the non-hypnobirthing group without stress.

3. The opening of the uterine cervix in the non-hypnobirthing group with stress is different from the non-hypnobirthing group without stress.

Effect of Hypnobirthing Method to Prevent Partus Prematurus Imminens in Factory Worker Mothers with *Partial Least Square* (PLS) Statistical Test

This section will review the data and discussion with calculations using partial least square (PLS). The analysis carried out evaluates the outer model measurement results and evaluates the structural model (inner model). Measuring the outer model Partial Least Square (PLS) to determine the validity and reliability of indicators that measure latent variables. The validity test criteria in a study refer to the amount of outer loading of each indicator on the latent variable. Researchers used SmartPLS 3.0 to conduct data processing on the results of this study where the data collected had been screened so that there were no questionnaire results that were missing value filling outside the predetermined measurement scale. This section will present various interpretations of the pre-processed data in the form of analysis of each variable, namely the analysis of hypnobirthing, sociodemographics, environmental stressors, stress levels, uterine cervical opening, uterine contractions and cortisol levels.

Outer Model Evaluation

Data processing using SmartPLS 3.0 validity and reliability tests. For validity testing using *convergent validity* and *average variance extracted* (AVE) is required to have a minimum value of 0.5. The reliability test is known from the *Cronbach's alpha* and *Composite reliability* scores. The *Cronbach's alpha* score is required to be at least 0.6 while the minimum *Composite reliability* score is 0.7. The following is the initial model of the research:

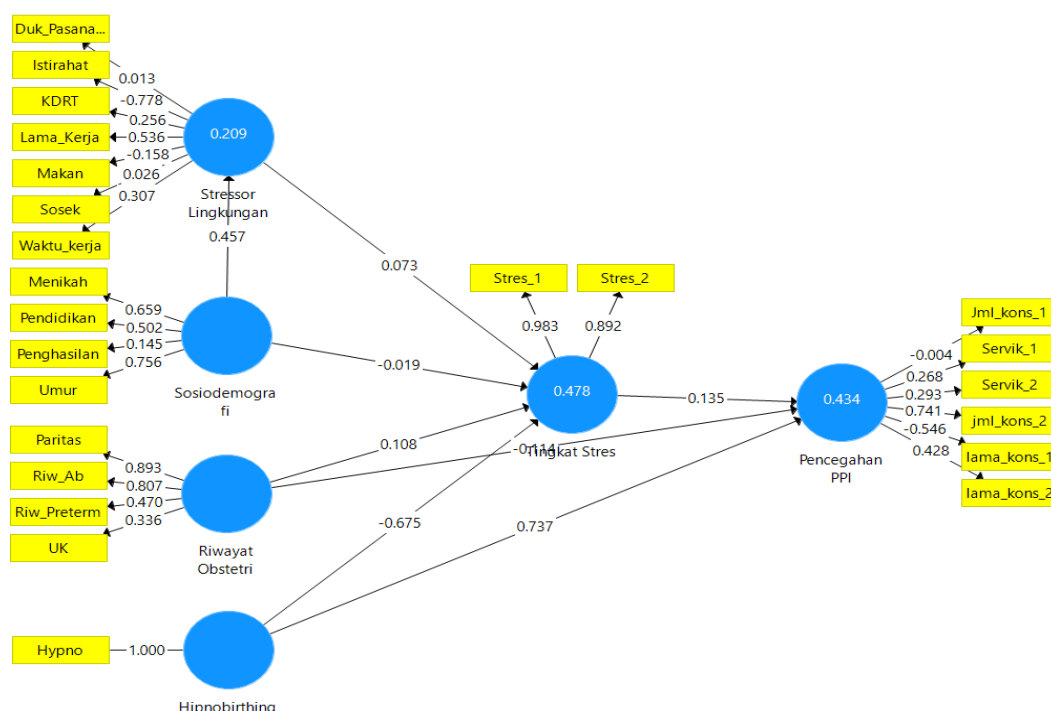


Figure 2. Initial Outer Model of Hypnobirthing Method Implementation to Prevent Partus Prematurus Imminens in Factory Workers

Based on Figure 2, the *outer loading* value of each *observed variable* can be known. The *outer loading* value of the *observed* and *latent variables* of the effect of the Hypnobirthing Method to Prevent Partus Prematurus Imminens on Factory Workers is presented in the table below:

Table 7. Results of convergent validity measurement on the initial outer model

<i>Latent Variable</i>	<i>Observed Variable</i>	<i>Outer Loading</i>	<i>Description</i>
Hypnobirthing	Trance state	1,000	Valid
Sociodemographics	Age	0,756	Valid
	Education	0,502	Invalid
	Income	0,145	Invalid
	Length of marriage	-0,517	Invalid
Environmental stressors	Partner support	0,013	Invalid
	Duration of break	-0,778	Invalid
	Length of service	0,636	Valid
	Working time	0,307	Invalid
	Eat at the factory	0,026	Invalid
	DOMESTIC VIOLENCE	0,256	Invalid
	Socio-economic	0,026	Invalid
Obstetric history	Gestational age	0,336	Invalid
	Parity	0,893	Valid
	History of abortion	0,807	Valid
	History of prematurity	0,618	Valid
Stress level	Pre-stress level	0,983	Valid
	Post stress level	0,892	Valid
Prevention of PPI	Number of pre contractions	-0,004	Invalid
	Number of post contractions	0,741	Valid
	Length of pre-contraction	-0,546	Invalid
	Length of post contraction	0,634	Valid
	Pre cervical opening	0,268	Invalid
	Post cervical opening	0,293	Invalid

Based on table 7, invalid results will be removed from the model. The next model will be measured again, the following *convergent validity* evaluation results are presented in the final *outer model* image below:

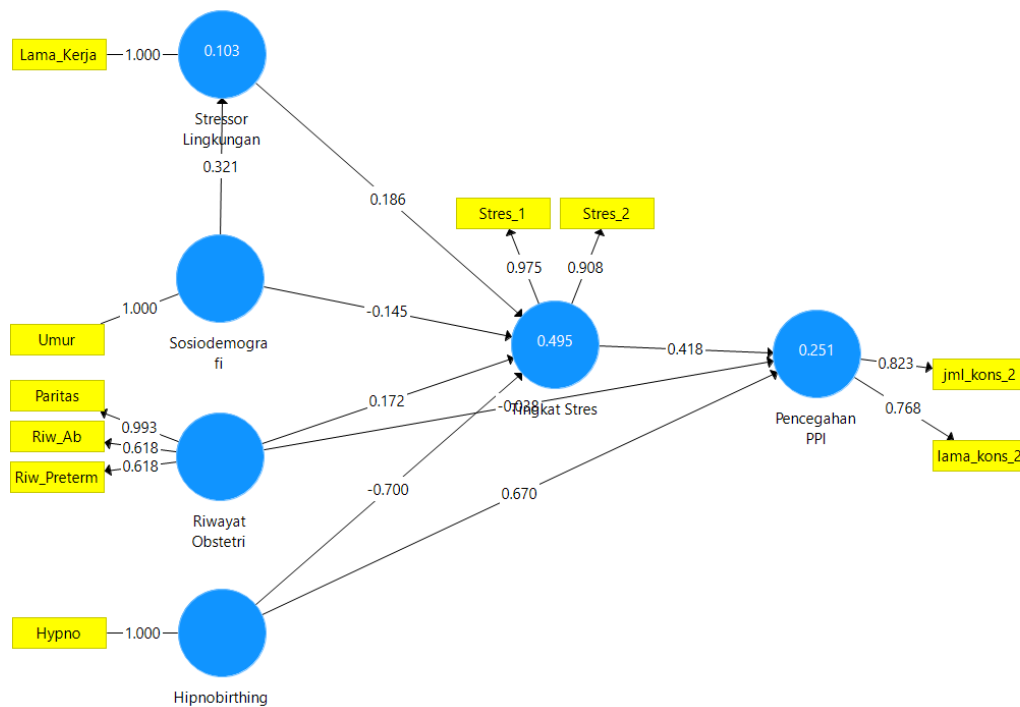


Figure 3. Outer model of the final Hypnobirthing Method Implementation to Prevent Partus Prematurus Imminens in Factory Workers

Figure 3 shows that the *outer loading* values for all variables in the final structural model are valid. The *outer loading* values of the valid latent variables can be seen in the table below:

Table 8. Results of convergent validity measurement on the final outer model

<i>Latent Variable</i>	<i>Observed Variable</i>	<i>Outer Loading</i>	<i>Description</i>
Hypnobirthing	Trance state	1,000	Valid
Sociodemographics	Age	1,000	Valid
Environmental stressors	Working time	1,000	Valid
Obstetric history	Parity	0,993	Valid
	History of prematurity	0,618	Valid
	Histort of abortus	0,618	Valid
Stress level	Pre-stress level	0,975	Valid
	Post stress level	0,908	Valid
Prevention of PPI	Number of post contractions	0,823	Valid
	Duration of post contraction	0,768	Valid

The results of measuring construct validity with *convergent validity* in table 5.12 show that all indicators are valid in forming and measuring latent variables and indicate a good measurement model. The analysis results show that all observed variables have an outer loading value ≥ 0.6 .

Structural Model Evaluation (*Inner Model*)

Inner model evaluation is related to hypothesis testing of the influence between research variables. *Inner model* testing is used to see the influence between latent variables after *bootstrapping*. The following is a picture of the t statistical value of the influence between variables in the *inner model*.

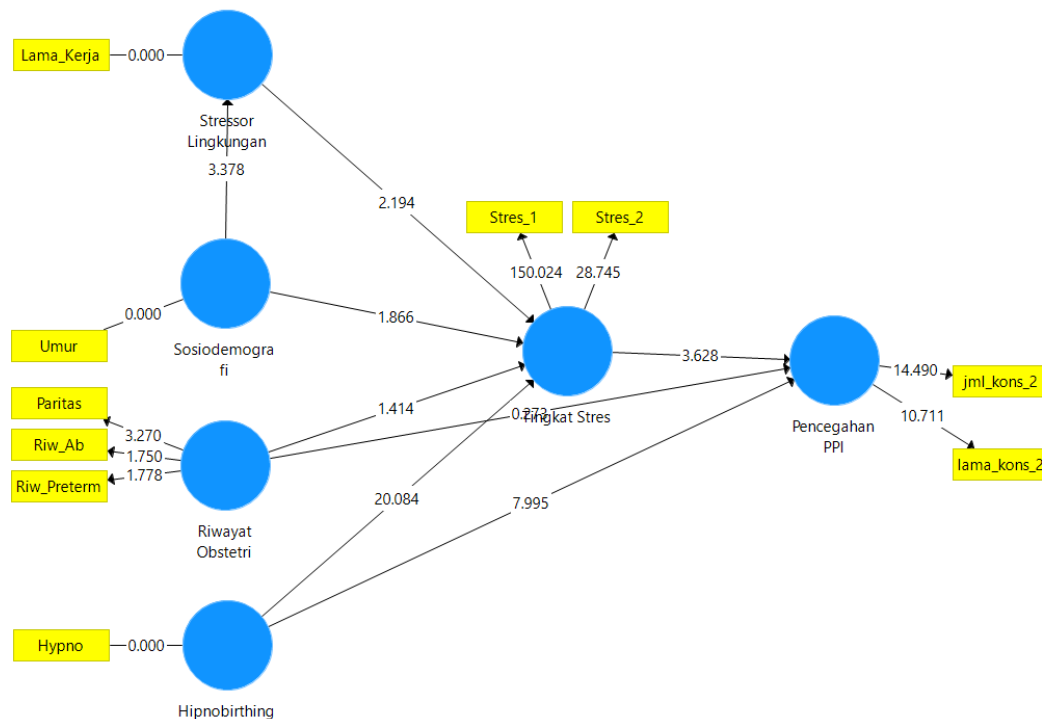


Figure 4. inner model of Hypnobirthing Method Implementation to Prevent *Partus Prematurus Imminens* in Factory Workers

Furthermore, it is seen from the results of the effect value and path coefficient of exogenous factors and endogenous factors. The path coefficient of exogenous factors is said to have a significant effect on endogenous factors if the t-statistic of the processing results is greater than the t-table value. The t-table value using an error tolerance (α) = 5% with 1.96. If the statistical value < 1.96 means that these variables do not affect each other. The test results between variables display the effect value, t statistics, p value and f square. The f square value is the qualitative influence of variables at the structural level (low, moderate and high), if the f square value of 0.02 is classified as low, 0.15 is moderate and 0.35 is high (Hair, 2018).

Table 9. results of testing the influence value between variables on the *inner model*

No.	Influence between variables	T statistics	p value	f square
1	Hypnobirthing → PPI Prevention	7,96	0,000 (significant)	0,38 (high)
2	Hypnobirthing → stress levels	20,08	0,000 (significant)	0,92 (high)
3	Obstetric history → PPI prevention	0,273	0,785 (not significant)	-
4	Obstetric history → stress levels	1,41	0,158 (not significant)	-

5	Sociodemographics→ environment stress	3,378	0,001 (significant)	0,12 (low)
6	Sociodemographics→ stress levels	1,86	0,06 (not significant)	-
7	Environmental stressors→ stress levels	2,19	0,029 (significant)	0,06 (low)
8	Stress levels→ prevention of PPI	5,13	0,000 (significant)	0,21 (moderat)

Evaluation of Goodness and Fit of the Model

Evaluation of the goodness and fit of the model is seen from the coefficient of determination (R Square), which is used to determine the amount of variation in endogenous variables that can be explained by other exogenous or endogenous variables in this model. According to Chin (1998), the qualitative interpretation value of R Square is 0.19 (low influence), 0.33 (moderate influence) and 0.66 (high influence). The results of R Square can be seen in the table below:

Table 10. R Square value

Variables	R Square	Adjusted R Square
Prevention of PPI	0,251	0,228
Stress level	0,495	0,473
Environment stress	0,103	0,094

Based on table 10, it can be seen the magnitude of the influence between variables including:

- 1) The R Square value of PPI prevention is 0.251 or 25.1%, including low influence.
- 2) The R Square value of stress level is 0.495 or 49.5% including moderate influence.
- 3) The R Square value of environment stress is 0.103 or 10.3%, including low influence.

The model fit test uses several statistical indicators including, *Standardized Root Mean Square Residual* (SRMR). The results of the mode fit test can be seen below:

Table 11. Model Fit

	Saturated Model	Estimated Model
SRMR	0,092	0,110
d_ ULS	0,464	0,670
d_ G	0,408	0,433
Chi-Square	189,301	247,264
NFI	0,577	0,448

The SRMR value between 0.08-0.1 is still acceptable, and the value for SRMR in the results of this study is 0.09 so that the model fits.

Indirect Effect

The indirect effect of Hypnobirthing Method Implementation to Prevent *Partus Prematurus Imminens* on Factory Workers can be seen in the table as follows:

Table 12. indirect effect between variables

No.	Influence between variables	p value	Description
1	Hypnobirthing→ stress levels→ PPI prevention	0,000	Significant
2	Obstetric history→ stress levels→ prevention of PPIs	0,203	Not significant
3	Sociodemographics→ stress levels→ PPI prevention	0,103	Not significant
4	Environmental stressors→ stress levels→ PPI prevention	0,105	Not significant

Based on the table, it is found that the indirect effect is hypnobirthing affecting stress levels which will affect the prevention of PPI.

Discussion

Effect of Hypnobirthing on Stress Levels

The study found that hypnobirthing significantly reduced stress levels in pregnant factory worker mothers, with an average reduction of up to 6 points in the treatment group compared to the control group. Hypnobirthing techniques help reduce anxiety and fear of labor by providing a greater sense of control and confidence in the mother. This is in line with research showing that relaxation techniques can change perceptions of pain and prepare mothers mentally to face labor. (Olza et al., 2020; Uldal et al., 2023)..

Stress during pregnancy negatively affects the nervous and hormonal systems, increasing cortisol levels which can affect the health of both mother and baby. Hypnobirthing, with its relaxation and hypnosis approach, suppresses stress through neurophysiological processes that reduce the release of stress hormones such as ACTH and cortisol. This technique also decreases anxiety related to pregnancy risks, such as fear of cesarean section, which impacts maternal and fetal well-being. (Fata, 2021; Champagne et al., 2011)..

Effect of Hypnobirthing on Duration of Uterine Contractions

Hypnobirthing has been shown to affect uterine contractions, decreasing the intensity and duration of contractions in mothers at risk of partus prematurus imminens (PPI). This study shows that hypnobirthing, combined with tocolytic treatment, is able to suppress uterine contractions, prolong gestational age, and reduce the risk of preterm labor. This is particularly important in Indonesia, where the preterm delivery rate is 16%, the fifth highest in the world. (WHO, 2024; Purwoko et al., 2024)..

In labor, hypnobirthing helps reduce uterine contractions through relaxation techniques and positive suggestion focus, reducing uterine muscle activity and increasing pain tolerance. This technique also provides better control for mothers in dealing with contractions, allowing them to feel more prepared and calm during labor. The results of this study are in line with other studies showing that hypnobirthing can prolong pregnancy by an average of 18.8% in mothers at risk of preterm labor (Brown, 2007).

Effect of Hypnobirthing on Uterine Cervical Opening

Hypnobirthing has a significant effect on the opening of the cervix uteri in mothers with PPI. This study showed that hypnobirthing reduces pressure on the cervix thus preventing premature opening, which helps prevent untimely birth. The myometrium must remain relaxed during pregnancy to keep the cervix closed and prevent preterm labor (Kota et al., 2013).

Hypnobirthing techniques play an important role in helping to maintain myometrial calmness and reduce cervical tension. In this study, mothers who received hypnobirthing therapy showed slower cervical opening than the control group. Hypnosis helps mothers prepare themselves physically and emotionally for labor, increasing motivation to maintain pregnancy until term (Brown, 2007).

Effect of Hypnobirthing to Prevent Partus Prematurus Imminens in Factory Worker Mothers

Hypnobirthing has a significant influence in preventing PPI in factory worker mothers, as evidenced by the results of *PLS SEM* analysis which shows that 31.5% of PPI prevention is influenced by hypnobirthing and other factors such as sociodemographics, stress levels, and obstetric history. Hypnobirthing techniques help to reduce stress triggered by environmental stressors and workload at the workplace, which is often a precipitating factor for PPI. (Koirala, 2022).

In addition, hypnobirthing helps mothers manage fears of birth and increases self-confidence. The stress of a demanding work environment can be exacerbated by a lack of partner support and social roles, especially in mothers from low socioeconomic backgrounds. By helping mothers achieve mental and physical relaxation, hypnobirthing serves as a preventive method against the risk of preterm birth among working mothers. (Habib et al., 2017).

CONCLUSION

This study concluded that hypnobirthing has a significant effect in lowering stress levels, reducing the intensity and duration of uterine contractions, slowing cervical opening, in factory worker mothers at risk of partus prematurus imminens (PPI). This effect was also seen in the prevention of PPI, where hypnobirthing directly reduced stress levels and the risk of preterm labor. Meanwhile, other variables such as obstetric history, sociodemographics, and environmental stressors showed no direct effect on PPI prevention or stress levels, emphasizing that the hypnobirthing approach is highly beneficial for mothers at risk of preterm labor.

As a complementary therapy, hypnobirthing is recommended to be applied more widely to high-risk pregnant women as a preventive measure for preterm labor. Hospitals and health agencies can consider using hypnobirthing to provide comfort, reduce anxiety, and support maternal mental health during pregnancy and labor. The implementation of this therapy is expected to improve maternal and infant health, reduce the risk of morbidity and mortality, and provide a calmer and more controlled labor experience for pregnant women.

REFERENCES

- Adhikari D, Zheng W, Shen Y, Gorre N, Hamaiainen T, Cooney AJ, Huhtaniemi I, Lan Z, Liu K (2010) Tsc/mTORC1 signaling in oocytes governs the quiescence and activation of primordial follicles. *Hum Mol Genet* 18:397–410
- Agrawal V, JaiswalMK, Mallers T, Katara GK, Gilman-Sachs A, Beaman KD et al (2015) Altered autophagic flux enhances inflammatory responses during inflammation-induced preterm labor. *Sci Rep* 5:9410.
- Akhter, S., Rutherford, S. and Chu, C., 2017. What makes pregnant workers sick: why, when, where and how? An exploratory study in the ready-made garment industry in Bangladesh. *Reproductive health*, 14(1), pp.1-9.
- Austin, M.P. and Marcé Society Position Statement Advisory Committee, 2014. Marcé International Society position statement on psychosocial assessment and depression screening in perinatal women. *Best Practice & Research Clinical Obstetrics & Gynaecology*, 28(1), pp.179-187.
- Barrett, D. (Ed.). (2010). Hypnosis and hypnotherapy Vol. 1. Santa Barbara, CA: Praege.
- Beebe, K.R., 2014. Hypnotherapy for labor and birth. *Nursing for women's health*, 18(1), pp.48-59.
- Beevi, Z., Low, W.Y. and Hassan, J., 2016. Impact of hypnosis intervention in alleviating psychological and physical symptoms during pregnancy. *American Journal of Clinical Hypnosis*, 58(4), pp.368-382.

- Biaggi, A., Conroy, S., Pawlby, S. and Pariante, C.M., 2016. Identifying the women at risk of antenatal anxiety and depression: a systematic review. *Journal of affective disorders*, 191, pp.62-77.
- Binder EB, Nemeroff CB (2010). The CRF system, stress, depression and anxiety – insights from human genetic studies. *Mol Psychiatry* 15: 574–588
- Brittain, K., Myer, L., Koen, N., Koopowitz, S., Donald, K.A., Barnett, W., Zar, H.J. and Stein, D.J., 2015. Risk factors for antenatal depression and associations with infant birth outcomes: results from a South African birth cohort study. *Paediatric and perinatal epidemiology*, 29(6), pp.505-514.
- Brown C and Hammond C, D. 2007. Evidence-based clinical hypnosis for obstetrics, labor and delivery, and preterm labor. *Intl. Journal of Clinical and Experimental Hypnosis*, 55(3), pp.355-371.
- Chaiworapongsa, T., Erez, O., Kusanovic, J.P., Vaisbuch, E., Mazaki-Tovi, S., Gotsch, F., Than, N.G., Mittal, P., Kim, Y.M., Camacho, N. and Edwin, S., 2008. Amniotic fluid heat shock protein 70 concentration in histologic chorioamnionitis, term and preterm parturition. *The Journal of Maternal-Fetal & Neonatal Medicine*, 21(7), pp.449-461.
- Challis, J.R., Matthews, S.G., Gibb, W. and Lye, S.J., 2000. Endocrine and paracrine regulation of birth at term and preterm. *Endocrine reviews*, 21(5), pp.514-550.
- Chang A, Zhang Z, Jia L, Zhang L, Gao Y, Zhang L (2013) Alteration of heat shock protein 70 expression levels in term and preterm delivery. *J Matern Fetal Neonatal Med* 26:1581–1585.
- Cherak, S. J. *et al.* (2021) ‘Corrigendum to “The effect of gestational period on the association between maternal prenatal salivary cortisol and birth weight: A systematic review and meta-analysis” [Psychoneuroendocrinology 94 (2018) 49–62](S0306453017316153)(10.1016/j.psyneuen.2018.04.023)’, *Psychoneuroendocrinology*, 131(June), p. 105337. doi: 10.1016/j.psyneuen.2021.105337.
- Christian, L.M., 2019. At the Forefront of Psychoneuroimmunology in Pregnancy: Implications for Racial Disparities in Birth Outcomes PART 1: Behavioral Risks Factors. *Neuroscience & Biobehavioral Reviews*.
- Christian, L. M. (2020) ‘At the forefront of psychoneuroimmunology in pregnancy: Implications for racial disparities in birth outcomes: PART 2: Biological mechanisms’, *Neuroscience and Biobehavioral Reviews*, 117(July 2018), pp. 327–333. doi: 10.1016/j.neubiorev.2019.03.010.
- Chooi, C. S., Nerlekar, R., Raju, A., & Cyna, A. M. 2011. The effects of positive or negative words when assessing postoperative pain. *Anesthesia and Intensive Care*, 39(1), 101–106.
- Dadi, A.F., Miller, E.R. and Mwanri, L., 2020. Antenatal depression and its association with adverse birth outcomes in low and middle-income countries: A systematic review and meta-analysis. *PLOS ONE*, 15(1), pp.1-23.
- Dietze, T.R., Rose, F.F. and Moore, T.A., 2016. Maternal variables associated with physiologic stress and perinatal complications in preterm infants. *Journal of neonatal-perinatal medicine*, 9(3), pp.271-277.
- Dokladny, K., Myers, O.B. and Moseley, P.L., 2015. Heat shock response and autophagy cooperation and control. *Autophagy*, 11(2), pp.200-213.
- Dolce, K. (2010). HypnoBirthing® outcomes United States, 2005-2010. Pembroke, NH: HypnoBirthing Institute. Retrieved from http://www.hypnobirthing.com/US_Outcomes_Summary_2010.pdf

- Doulaveris G, Orfanelli S, Benn K, Zervoudakis I, Skupski D, Witkin SS (2013) A polymorphism in an autophagy-related gene, ATG16L1, influences time to delivery in women with an unfavorable cervix who require labor induction. *J Perinat Med* 41:411–414.
- Dum, R. P., Levinthal, D. J. and Strick, P. L. (2016) ‘Motor, cognitive, and affective areas of the cerebral cortex influence the adrenal medulla’, *Proceedings of the National Academy of Sciences of the United States of America*, 113(35), pp. 9922–9927. doi: 10.1073/pnas.1605044113.
- Entringer, S., Buss, C., Wadhwa, P.D., 2015. Prenatal stress, development, health and disease risk: a psychobiological perspective-2015 Curt Richter Award Paper. *Psychoneuroendocrinology* 62, 366–375.
- Fisch, S., Brinkhaus, B. and Teut, M. (2017) ‘Hypnosis in patients with perceived stress - A systematic review’, *BMC Complementary and Alternative Medicine*, 17(1). doi: 10.1186/s12906-017-1806-0.
- Gavin, N.I., Gaynes, B.N., Lohr, K.N., Meltzer-Brody, S., Gartlehner, G. and Swinson, T., 2005. Perinatal depression: a systematic review of prevalence and incidence. *Obstetrics & Gynecology*, 106(5), pp.1071-1083.
- Gawriluk TR, Rucker EB (2015) BECN1, corpus luteum function, and preterm labor. *Autophagy*.11:183–184.
- Gillespie, S. L. *et al.* (2017) ‘Childhood stress and birth timing among African American women: Cortisol as biological mediator’, *Psychoneuroendocrinology*, 84, pp. 32–41. doi: 10.1016/j.psyneuen.2017.06.009.
- Gillespie, S.L., Mitchell, A.M., Kowalsky, J.M., Christian, L.M., 2018. Maternal parity and perinatal cortisol adaptation: the role of pregnancy-specific distress and implications for postpartum mood. *Psychoneuroendocrinology* 97, 86–93.
- Glover, V., 2015. Prenatal stress and its effects on the fetus and the child: possible underlying biological mechanisms. In *Perinatal programming of neurodevelopment* (pp. 269-283). Springer, New York, NY.
- Glover, V., O’Connor, T.G., O’Donnell, K., 2010. Prenatal stress and the programming of the HPA axis. *Neurosci. Biobehav. Rev.* 35, 17–22.
- Glynn, L.M., Schetter, C.D., Chicx-DeMet, A., Hobel, C.J., Sandman, C.A., 2007. Ethnic differences in adrenocorticotrophic hormone, cortisol and corticotropin-releasing hormone during pregnancy. *Peptides* 28, 1155–1161.
- Grote, N.K., Bridge, J.A., Gavin, A.R., Melville, J.L., Iyengar, S. and Katon, W.J., 2010. A meta-analysis of depression during pregnancy and the risk of preterm birth, low birth weight, and intrauterine growth restriction. *Archives of general psychiatry*, 67(10), pp.1012-1024.
- Hruzelier, J. 2000. Unwanted effects of hypnosis: A review of the evidence and its implications. *Contemporary Hypnosis*, 17, 163–193.
- Harris, A. and Seckl, J., 2011. Glucocorticoids, prenatal stress and the programming of disease. *Hormones and behavior*, 59(3), pp.279-289.
- Herlina, Y.N., Desmiwanti, D. and Desmiwanti, E., 2016. Hubungan Stresor Psikososial pada Kehamilan dengan Partus Prematurus. *Jurnal Kesehatan Andalas*, 5(1).
- Hirota Y, Cha J, Yoshie M, Daikoku T, Dey SK (2011) Heightened uterine mammalian target of rapamycin complex 1 (mTORC1) signaling provokes preterm birth in mice. *Proc Natl Acad Sci USA* 108:18073–18078.
- Hung TH, Hsieh TT, Chen SF, Li MJ, Yeh YL (2013) Autophagy in the human placenta throughout gestation. *PLoS One* 8:e83475.

- Husain, N., Cruickshank, K., Husain, M., Khan, S., Tomenson, B. and Rahman, A., 2012. Social stress and depression during pregnancy and in the postnatal period in British Pakistani mothers: a cohort study. *Journal of affective disorders*, 140(3), pp.268-276.
- Hypnosis Motivation Institute. 2010. Foundations in hypnotherapy. Tarzana, CA: Author. Retrieved from <http://www.hypnosis.edu/distance/foundations/workbook/v1.pdf>.
- Jeong, H.G., Lim, J.S., Lee, M.S., Kim, S.H., Jung, I.K. and Joe, S.H., 2013. The association of psychosocial factors and obstetric history with depression in pregnant women: focus on the role of emotional support. *General hospital psychiatry*, 35(4), pp.354-358.
- Kane, H.S., Dunkel Schetter, C., Glynn, L.M., Hobel, C.J., Sandman, C.A., 2014. Pregnancy anxiety and prenatal cortisol trajectories. *Biol. Psychol.* 100, 13–19.
- Kim YC, Guan KL (2015) mTOR: a pharmacologic target for autophagy regulation. *J Clin Invest.* 125:25–23.
- Kleinbub, J. R. *et al.* (2015) ‘Hypnosis-based psychodynamic treatment in ALS: A longitudinal study on patients and their caregivers’, *Frontiers in Psychology*, 6(JUN), pp. 1–14. doi: 10.3389/fpsyg.2015.00822.
- Kota, S.K., Gayatri, K., Jammula, S., Kota, S.K., Krishna, S.V.S., Meher, L.K. and Modi, K.D., 2013. Endocrinology of parturition. *Indian journal of endocrinology and metabolism*, 17(1), p.50.
- Langlois, F., Lim, D.S. and Fleseriu, M., 2017. Update on adrenal insufficiency: diagnosis and management in pregnancy. *Current Opinion in Endocrinology, Diabetes and Obesity*, 24(3), pp.184-192.
- Lara-Carrasco, J., Simard, V., Saint-Onge, K., Lamoureux-Tremblay, V. and Nielsen, T., 2013. Maternal representations in the dreams of pregnant women: a prospective comparative study. *Frontiers in psychology*, 4, p.551.
- McEwen BS, Gianaros PJ (2010). Central role of the brain in stress and adaptation: links to socioeconomic status, health, and disease. *Ann N Y Acad Sci* 1186 (1): 190–222.
- Melville, J.L., Gavin, A., Guo, Y., Fan, M.Y. and Katon, W.J., 2010. Depressive disorders during pregnancy: prevalence and risk factors in a large urban sample. *Obstetrics and gynecology*, 116(5), p.1064.
- Mongan, M. F. 2005. HypnoBirthing®: The Mongan method (3rd ed.). Deerfield Beach, FL: Health Communications, Inc
- Montgomery, G. H., David, D., Winkel, G., Silverstein, J. H., & Bovbjerg, D. H. 2002. The effectiveness of adjunctive hypnosis with surgical patients: A meta-analysis. *Anesthesia and Analgesia*, 94, 1639–1645.
- Moore, T.A., Ahmad, I.M., Schmid, K.K., Berger, A.M., Ruiz, R.J., Pickler, R.H. and Zimmerman, M.C., 2019. Oxidative Stress Levels Throughout Pregnancy, at Birth, and in the Neonate. *Biological research for nursing*, 21(5), pp.485-494.
- Naughton, M., Dinan, T.G. and Scott, L.V., 2014. Corticotropin-releasing hormone and the hypothalamic–pituitary–adrenal axis in psychiatric disease. In *Handbook of clinical neurology* (Vol. 124, pp. 69-91). Elsevier.
- Pariante C.M. 2014. Depression during pregnancy: molecular regulations of mothers’ and children’s behaviour. *Biochem. Soc. Trans.* 42:582–586.
- Purba, S.D. and Sandroto, C.W., 2016. The mediating effect of life complexity and dynamic, and work-life conflict on the effect of motivation on continuance commitment and quality of life of female factory workers in Jabodetabek. *Journal of Economics, Business & Accountancy*, 19(1), pp.79-92.
- Ramos, I.F., Guardino, C.M., Mansolf, M., Glynn, L.M., Sandman, C.A., Hobel, C.J., Dunkel Schetter, C., 2018. Pregnancy anxiety predicts shorter gestation in Latina and non-Latina

- white women: the role of placental corticotrophin-releasing hormone. *Psychoneuroendocrinology* 99, 166–173.
- Romano, A. M., & Lothian, J. A. 2008. Promoting, protecting, and supporting normal birth: A look at the evidence. *Journal of Obstetric, Gynecologic & Neonatal Nursing*, 37, 94–104.
- Romero R, Dey SK, Fisher SJ (2014) Preterm labor: one syndrome, many causes. *Science* 345:760–765.
- Satsangi, A. K. and Brugnoli, M. P. (2018) ‘Anxiety and psychosomatic symptoms in palliative care: From neuro-psychobiological response to stress, to symptoms’ management with clinical hypnosis and meditative states’, *Annals of Palliative Medicine*, 7(1), pp. 75–111. doi: 10.21037/apm.2017.07.01.
- Shah, M.C., Thakkar, S.H. and Vyas, R.B., 2011. Hypnosis in pregnancy with intrauterine growth restriction and oligohydramnios: An innovative approach. *American Journal of Clinical Hypnosis*, 54(2), pp.116-123.
- Shepard, J. D., Barron, K. W. and Myers, D. A. (2000) ‘Corticosterone delivery to the amygdala increases corticotropin-releasing factor mRNA in the central amygdaloid nucleus and anxiety-like behavior’, *Brain Research*, 861(2), pp. 288–295. doi: 10.1016/S0006-8993(00)02019-9.
- Smedberg, J., Lupattelli, A., Mårdby, A.C., Øverland, S. and Nordeng, H., 2015. The relationship between maternal depression and smoking cessation during pregnancy—a cross-sectional study of pregnant women from 15 European countries. *Archives of women's mental health*, 18(1), pp.73-84.
- Srinivasan, N., Murthy, S., Singh, A.K., Upadhyay, V., Mohan, S.K. and Joshi, A., 2015. Assessment of burden of depression during pregnancy among pregnant women residing in rural setting of Chennai. *Journal of clinical and diagnostic research: JCDR*, 9(4), p.LC08.
- Sunday, E.M., Okoli, P.C. and Dinwoke, V.O., 2018. Level of awareness and treatment of anxiety and depression during pregnancy in southeast Nigeria. *South African Journal of Psychiatry*, 24(1).
- Thomson, M., 2013. The physiological roles of placental corticotropin releasing hormone in pregnancy and childbirth. *J. Physiol. Biochem.* 69, 559–573.
- Vale W, Spiess J, Rivier C et al. (1981). Characterisation of a 41 residue ovine hypothalamic peptide that stimulates secretion of the corticotropin and betaendorphin. *Science* 213: 1394–1399.
- Varga, K. and Kekecs, Z. (2014) ‘L’oxytocine et le cortisol en interaction hypnotique’, *International Journal of Clinical and Experimental Hypnosis*, 62(1), pp. 111–128. doi: 10.1080/00207144.2013.841494.
- Wang, H., Naghavi, M., Allen, C., Barber, R.M., Bhutta, Z.A., Carter, A., Casey, D.C., Charlson, F.J., Chen, A.Z., Coates, M.M. and Coggeshall, M., 2016. Global, regional, and national life expectancy, all-cause mortality, and cause-specific mortality for 249 causes of death, 1980–2015: a systematic analysis for the Global Burden of Disease Study 2015. *The lancet*, 388(10053), pp.1459-1544.
- Werner, A., Uldbjerg, N., Zachariae, R., Wu, C.S. and Nohr, E.A., 2013. Antenatal hypnosis training and childbirth experience: a randomized controlled trial. *Birth*, 40(4), pp.272-280.
- WHO. 2017. Depression and other common mental disorders: global health estimates. World Health Organization.

- Widiana, I.K.O., KARAKTERISTIK PASIEN PARTUS PREMATURUS IMMINENS DI RSUP SANGLAH DENPASAR PERIODE 1 APRIL 2016-30 SEPTEMBER 2017. *E-Jurnal Medika Udayana*, 8(3).
- Witkin, S.S., Kanninen, T.T. and Sisti, G., 2017. The role of hsp70 in the regulation of autophagy in gametogenesis, pregnancy, and parturition. In *The Role of Heat Shock Proteins in Reproductive System Development and Function* (pp. 117-127). Springer, Cham.
- Witthöft, M. and Jasper, F. (2016) 'Somatic Symptom Disorder', *Encyclopedia of Mental Health: Second Edition*, pp. 211–214. doi: 10.1016/B978-0-12-397045-9.00096-3.
- Woods SM, Melville JL, Guo Y, Fan MY, Gavin A. 2010. Psychosocial stress during pregnancy. *Am J Obstet Gynecol*, 202(1):61-7
- Yusuff M. A.S., Tang, L., Binns, C.W. and Lee, A.H., 2016. Prevalence of antenatal depressive symptoms among women in Sabah, Malaysia. *The Journal of Maternal-Fetal & Neonatal Medicine*, 29(7), pp.1170-1174.
- Zeng, Y., Cui, Y. and Li, J., 2015. Prevalence and predictors of antenatal depressive symptoms among Chinese women in their third trimester: a cross-sectional survey. *BMC psychiatry*, 15(1), p.66.