HUE UNIVERSITY
UNIVERSITY OF MEDICINE AND PHARMACY

TRAN DINH TRUNG

ASSESSING THE IMPACT OF HUSBAND-INDUCED VIOLENCE DURING PREGNANCY ON BIRTH OUTCOMES, MATERNAL POSTPARTUM DEPRESSION AND CHILD DEVELOPMENT: A COHORT STUDY IN DA NANG CITY

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ABSTRACT OF DOCTORAL THESIS IN PUBLIC HEALTH

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BACKGROUND

1. THE URGENCY OF THE PROJECT

Prenatal Intimate Partner Violence, especially by the husband, is a public health and human rights issue. During pregnancy, there are many physical, psychological, social, and economic changes, making women more vulnerable to violence. Husband abuse during this period directly affects the mother and leaves consequences for the fetus and child.

The global systematic review in 2021 shows that about 1/4 of pregnant women have experienced violence by their husband/partner, of which emotional violence accounts for 18.7%, physical violence 9.2% and sexual 5.5%. In Vietnam in 2019, 63% of married women were abused by their husbands, and 31.6% were abused by their husbands in the last 12 months. Worryingly, more than 90% of abused women do not seek help, due to fear, shame, normalization of violence, and a lack of faith in life.

In Da Nang, there is hardly any evidence that provides longitudinal follow-up research on husband violence during pregnancy and the health consequences from birth to after 12 months of age. That's why we carried out the project: ***"Assessing the impact of husband-induced violence during pregnancy on maternal birth outcomes, postpartum depression and child development: A cohort study in Da Nang City"*** with the following objectives:

1. Describe the actual situation of violence caused by the husband during pregnancy in Da Nang city and some related factors.

2. Assess the impact of husband-induced violence during pregnancy on maternal birth outcomes, postpartum depression and child development in Da Nang city.

2. SCIENTIFIC AND PRACTICAL SIGNIFICANCE

This study has important scientific implications in supplementing the evidence of husband-induced violence during pregnancy – an area where data is lacking in Viet Nam, especially longitudinal follow-up data. The cohort study design allowed to assess the cause-and-effect relationship between violence during pregnancy and health outcomes such as birth outcomes, maternal postpartum depression, and child development in the first year of life. This helps to strengthen the scientific basis in the field of social epidemiology, reproductive health and maternal and child health.

In terms of practical significance, the study provides a scientific basis for the health sector and local authorities to implement programs to screen, detect and support abused pregnant women. In addition, the study also contributes to helping grassroots health workers in identifying, assessing and responding to domestic violence during prenatal examination and postpartum monitoring. These contributions are not only valuable in Da

Nang but can also be applied in other localities, contributing to improving the quality of care for women and children in the first 1000 days of life – a decisive period for comprehensive human development.

3. CONTRIBUTION OF THE THESIS

- The first cohort study in Vietnam to assess the impact of violence in pregnancy, following women from the time of birth to 12 months postpartum, allowing for a comprehensive observation and analysis of the multidimensional effects of violence on maternal health and infant development over time.

- Research makes an important contribution to health and community practice, helps raise awareness of violence against pregnant women, supports the development of effective intervention programs, and serves as a basis for education, counseling, and comprehensive health care for women and children.

- Research of international significance, providing scientific basis and practical data for low- and middle-income countries, supporting policy making to prevent violence, improving the quality of life of women and children, especially in child health care in the first 1000 days of life – a decisive stage for global development human face.

Chapter 1
DOCUMENTATION OVERVIEW

1.1. THE CONCEPT OF VIOLENCE

1.1.1. Violence against women

According to the Ministry of Justice (2014), violence is understood as "the use of force to coerce, suppress or subvert ".

1.1.2. Violence caused by husband

Husband/partner violence is an act of aggression that occurs within the framework of a close emotional relationship. Spousal/partner violence can manifest at different levels from a single incident of violence that has a long-term impact to chronic episodes of violence that last many years.

For women during pregnancy, the U.S. Centers for Disease Control and Prevention defines prenatal intimate partner violence (p-IPV) as "any physical, sexual, psychological/emotional violence or threats of physical or sexual violence that a pregnant woman experiences."

1.2. THE CONCEPT OF BIRTH OUTCOMES, MATERNAL DEPRESSION AND CHILD DEVELOPMENT FROM BIRTH

1.2.1. Birth outcomes

Birth outcomes are understood as outcomes related to the health of the mother and baby during labor, delivery and the postpartum period. This indicator plays an important role in assessing the effectiveness of maternity care, and at the same time reflects the overall health status of the mother and baby after birth.

- Form of birth (normal birth, cesarean section); Obstetric complications; Premature babies (gestational age <37 weeks); Low birth weight (<2500g); The APGAR (Appearance-Pulse-Grimace-Activity-Respiration) is low 1 or 5 minutes after birth.

Postpartum outcomes are often related to the long-term development and health of the mother and child, including: Postpartum maternal mental health problems (postpartum depression); Developmental disorders; Nutritional status (growth in weight, height with age).

1.3. CONSEQUENCES OF HUSBAND ABUSE DURING PREGNANCY

1.3.1. Adverse Birth outcomes

Husband/partner abuse during pregnancy creates a stressful environment both physically and emotionally for the woman. In addition, if the mother is physically abused, injuries – especially in the abdomen – can have serious consequences for the pregnancy, such as obstetric complications, especially increasing the risk of preeclampsia or premature placental detachment, which directly threatens the life and health of both mother and baby.

1.3.2. Maternal perinatal depression

Pregnancy abuse is an experience of psychological trauma and constant stress that leads to burnout, and reduces the ability to cope and recover. Abuse is often accompanied by criticism and personal control, ingrained in the woman's lowered self-esteem, making them feel useless and lose faith in themselves. This problem significantly increases the risk of psychiatric disorders such as postpartum depression, generalized anxiety disorder, and post-traumatic stress disorder.

1.3.3. Child development

The environment in the womb and the mother's experiences during pregnancy have an effect on the development of the fetus. Spousal/partner violence impacts a child's development through a variety of complex mechanisms. Maternal stress hormone (cortisol) can be transmitted through the placenta and affect the development of the fetus's brain, especially the areas involved in emotions and the ability to cope with anxiety later in life, especially affecting the baby during the first 1000 days of life.

1.3.4. Nutritional status of children

The impact of violence during pregnancy on the nutritional status of children is indirect but extremely important. Abused women often have poor diets due to anxiety, lack of economic and social support, or financial and food controls, leading to poor maternal nutrition during pregnancy, poor fetal development, low birth weight, and low initial nutritional reserves.

1.4. EVALUATION SCALES AND INDICATORS IN RESEARCH

1.5. RESEARCH RELATED TO THE THESIS TOPIC

1.5.1. Research on the situation of violence caused by husbands during pregnancy

1.5.1.1. Rate of violence caused by husband during pregnancy

The rate of violence caused by husband/partner during pregnancy in the world

Nearly one-third of the world's women have been impacted by physical, sexual, or both violence in their lifetime. Among women aged 15 to 49 who have been in a romantic relationship, more than a quarter have been physically or sexually abused by a partner at least once since they turned 15. The rate varies by geography: it ranges from 20 percent in the Western Pacific, 22 percent in high-income countries and Europe, 25 percent in the Americas, rising to 31 percent in the Eastern Mediterranean, and peaking at 33 percent in Africa and Southeast Asia. The results of gender-related killings of women and girls show that in 2017 58% of women were intentionally killed by their husband/partner or other family member, more than one-third of women were intentionally killed by their current or former husband/partner.

Rates of husband violence during pregnancy in Viet Nam

When considering violence against pregnant women in general, including all three forms, the highest recorded rate was 35.3% in Hanoi, and the lowest was 17.3% in Hue. This shows that on average, one in 3 to 5 pregnant women in Vietnam suffers at least one form of violence from their husbands.

Differences in the rate of violence caused by husbands during pregnancy between countries and regions in Vietnam mainly stem from differences in socio-cultural culture, level of economic development, and legal system.

1.5.1.2. Factors related to husband violence during pregnancy

Violence perpetrated by a husband/partner is influenced by many motivating factors. Motivating factors include: the wife's personal characteristics such as living in the countryside, low education, financial dependence, alcoholism, or lack of social support; characteristics of the husband/partner such as low education, unemployment, alcoholism, aggressive behavior, patriarchal notions and desire to have sons; Along with that are economic difficulties, family stress, unwanted pregnancy and having had adverse childhood experiences. In addition, a lack of social support, isolation from the community and an unsafe home environment also increase the risk of violence.

1.5.2. Impact of pregnant women's violence on adverse birth outcomes and postpartum depression of mothers

1.5.2.1. Adverse Birth outcomes

Another aspect of violence during pregnancy is that it can lead to a significant increase in the rate of caesarean section, the risk of premature birth, low birth weight, and neonatal death.

A longitudinal cohort study of 1,939 pregnant women ≥18 years old in Sweden from 2012-2014 showed that violence increases women's risk of cesarean section, and emotional violence also significantly increases the risk of cesarean section regardless of whether it is a planned caesarean section or an emergency caesarean section (OR= 1.50; KTC95% 1.09-2.06). The study by author Simukai Shamu (2018) with a cross-sectional study documented that each form of IPV was associated with a history of miscarriage (OR: 1.26–1.38) and any negative maternal and infant health throughout their lives (OR: 1.32–1.55).

Research on spousal/partner violence during pregnancy on maternal health and newborn weight shows that violence during pregnancy is a significant risk factor for low birth weight infants. A cross-sectional study conducted by Gillbert et al. (2012) found that pregnant women who had experienced abuse had a higher risk of using alcohol and stimulants during pregnancy. Similarly, another study conducted in the United States in 2011 also showed a strong link between violence against pregnant women and slow weight gain throughout pregnancy.

1.5.2.2. Maternal depression

The impact of spousal/partner violence during pregnancy on maternal depression suggests an alarming link between violence and depression, both before and after birth.

Studies have shown that spousal/partner violence is a major risk factor for maternal depression. This is reflected in the OR index, which ranges from 1.98 in Ethiopia to 6.92 in Bangladesh. In Brazil, it was found that 41.5% of pregnant women had symptoms of depression. In the logistic regression analysis, these symptoms were significantly associated in women who experienced Husband/Partner Violence (OR = 6.74; 95% CI: 2.0 - 21.7). In India (2019), the presence of domestic violence was recorded, causing a 5 times higher risk of prenatal depression than other women.

1.5.2.3. Child development

Graham (2010) followed up for 2 years showed that spousal/partner violence not only affects social-emotional development, but also affects children's ability to speak. A cross-sectional study by Koenen (2003) found that children who witnessed abuse had an average IQ 8 points lower than children who were not exposed, even when controlling for possible confounding variables showed that there was a mutual influence between trauma-related distress and cognitive skills in children who witnessed itdomestic violence.

Donald's study (2018) involved 1,143 live births, 1,002 were followed after 24 months, and a total of 734 children (73%) were assessed for development, of which 354 children (48.2%) were girls. A high percentage of children classified as developmentally delayed (determined by giving a score of < -1 standard deviation below the average score calculated on the BSID-III scale from the U.S. population), 55.3% of children had >1 areas affected, and 10.2% had developmental delays in all areas. These include depression or abuse and maternal HIV infection ($p = 0.042$) that are associated with developmental delays in children.

1.5.2.4. Nutritional status of children

Spousal/partner abuse during or immediately before pregnancy has been documented to have a negative impact on the upbringing of infants and young children. Brand's (2011) study with a longitudinal tracking design indicates that women who experience abuse tend to be less likely to start breastfeeding, and those who have already started breastfeeding are also at risk of stopping breastfeeding significantly earlier after just four weeks postpartum. Lin's (2023) systematic review study concluded that maternal exposure to spousal/partner violence increased the risk of malnourished young children compared to mothers who did not experience violence.

The Barnett (2022) study that tracked the impact of spousal/partner violence during pregnancy on a child's development in the first 12 months of life found that violence (both emotional and physical) was associated with a child's weight loss both at birth and at 12 months of age.

1.6. INTRODUCTION TO THE STUDY AREA

The choice of Da Nang as the research area is necessary and appropriate. On the one hand, this is a locality that is in a period of rapid urbanization, with many potential risk factors as well as opportunities for social interventions; On the other hand, the interest of the government and the health system facilitates the application of research results.

Chapter 2
OBJECTS AND METHODS OF RESEARCH

2.1. OBJECTS OF RESEARCH

2.1.1. Phase 1: Cross-sectional study

The study subjects were pregnant women recruited at the end of pregnancy in communes/wards.

2.1.1.1. Selection criteria

Pregnant in the last 3 months, with a gestational age of ≥ 28 weeks.

Ages from 18 to 49 years.

Registered marriage and living with her husband.

Have permanent or temporary residence (at least 12 months) in Da Nang city.

Ability to understand information about the study and consent to participate in the research in writing (consent form to participate in the study).

There were no severe mental illnesses or other health conditions that seriously affected the ability to provide accurate information and participate in follow-up throughout the study.

2.1.1.2. Exclusion criteria

There is a plan or high possibility of moving the place of residence out of Da Nang city within 12 months after giving birth.

Unable to communicate effectively or provide reliable information for research purposes (due to severe language barriers).

2.1.2. Stage 2: Cohort study from birth

Includes women who were surveyed at the end of pregnancy to assess birth outcomes, maternal postpartum depression, and postnatal development followed up for 12 months postpartum.

2.1.2.1. Selection criteria

Participated in and completed the survey/interview at the initial stage of the study (during pregnancy).

Living/residing in Da Nang city (during the monitoring period).

Agree to participate in follow-up research.

2.1.2.2. Exclusion criteria

Do not give birth at medical facilities in Da Nang city.

Moving out of Da Nang city before the time of collecting monitoring data.

Loss of track/loss of contact when unable to contact after multiple attempts (3 times).

2.2. TIME AND PLACE OF STUDY

2.2.1. Duration of research

From October 2022 to June 2024.

2.2.2. Research location

In 28 wards and communes of Da Nang city.

2.3. RESEARCH METHODOLOGY

2.3.1. Research design

The study consisted of two main phases to meet the set research objectives: phase 1 using a cross-sectional study design at the time of selection and phase 2 using a cohort research design at birth.

2.3.2. Sample size and sample selection method

2.3.2.1. Sample size

+ Phase 1: Sample size for cross-sectional descriptive studies.

The sample size is calculated according to the scale estimation formula:

$$\text{n xDE} = Z^2_{1-\frac{\alpha}{2}} \times \frac{p\,(1-p)}{d^2}$$

In which:

n : The minimum sample size required for the study.

Z : With a 95% probability there is Z = 1.96 (looked up in table Z).

α : Statistical significance level (probability of error type 1, α = 0.05).

d = 0.05: is the absolute acceptable error.

p : 0.234 (The percentage of women who suffer from violence from their husbands during pregnancy in Ho Chi Minh City (2019) according to the CTS-2 scale by Tran Thi Nhat Vy is 23.4%).

DE: design coefficient is equal to 4. Because pregnant women participating in the same city often have similar characteristics, the information they provide is less diverse. Therefore, in order to get accurate results equivalent to random sampling, the sample size must be increased by 4 times.

$$n = 1{,}96^2 \times \frac{0{,}234 \times (1 - 0{,}234)}{0{,}05^2} x4 \approx 1104$$

To prevent sample loss, we took another 10% and the expected sample size was 1214 study subjects. In fact, we have collected **1235** subjects that meet the selection and exclusion criteria.

+ Phase 2: Sample size for cohort studies from birth.

The sample size was calculated according to the formula for the cohort study:

$$n = \frac{\left\{Z_{1-\frac{\alpha}{2}}\sqrt{2\bar{P}(1-\bar{P})} + Z_{1-\beta}\sqrt{P_1(1-P_1) + P_2(1-P_2)}\right\}^2}{(P_1 - P_2)^2}$$

n: is the common sample size

Z1-α/2: the value from the standard distribution and is equal to 1.96.

Z1-β: the value from the statistical force and is equal to 0.842.

p1: Incidence in the exposure group

p2: Incidence in the non-exposed group

Relative risk ratio test:

+ Lake: RR=1

+ H1: RR#1

p1:p2= 1:2 because the group of women who are abused is usually less than the group that is not abused. Ensuring increased reliability and statistical strength of the study.

In fact, we collected information at the 3rd follow-up on **638** study subjects, ensuring that it was higher with the minimum sample size calculated above. And with a ratio of 1:2, the number of subjects in the group exposed to violence was 190 subjects (mothers and children) and the group not exposed to violence was 448 subjects (mothers and children).

2.3.2.2. Sample selection method

+ Phase 1: Cross-sectional study: Using the multi-stage sample selection method.

+ Phase 2: Cohort research from birth

Selection of research subjects from the cross-sectional study ensures the selection criteria for cohort research.

2.3.3. Contents of the study

2.3.3.1. Research content for Objective 1: Describe the current situation of violence against women during pregnancy in Da Nang city

This content focuses on the collection and analysis of data at the time of selection of research subjects (when pregnant women are in the last 3 months of pregnancy) in order to provide a picture of the situation of violence and related factors in the study population.

- Prevalence of husband violence during pregnancy

- Factors related to violence in pregnancy:

+ Socio-economic and demographic characteristics of the mother: Age, educational level, occupation, marital status, number of births, economic status.

+ Information related to the husband: Age, education level, occupation, alcohol/drug use, history of abuse.

+ Level of social support: Evaluate the network and level of support that the mother receives from family, friends, and the community.

+ Adverse Childhood Experiences (ACEs) of mothers.

2.3.3.2. Objectives for Objective 2: To assess the impact of husband-induced violence during pregnancy on maternal birth outcomes, postpartum depression and child development This content focuses on the follow-up of selected subjects and the collection of data on outcomes that occur after the time of determining whether (or not yes) violence during pregnancy, in order to assess the cause-effect relationship.

- Birth outcomes: Information related to labor and delivery has been collected, including:

+ For mothers: Obstetric complications (preeclampsia, postpartum hemorrhage, infection), Form of birth (vaginal birth, cesarean section).

+ For newborns: Premature birth status (born before the 37th week of pregnancy), APGAR index at 5 minutes after birth (to assess the child's initial health), birth weight (to determine the rate of underweight children - less than 2500 grams).

- Postpartum depression of mothers and the condition of young children in the first 12 months of life:

+ Postpartum depression: The mother's depression status has been periodically assessed at specific postpartum timelines (6 months, 12 months) using the PHQ-9 scale.

+ Child development: Young children's development has been monitored and assessed at appropriate timelines (6 months, 12 months postnatal) using the Ages & Stages Questionnaire (ASQ-3) tool issued by the Ministry of Health. focusing on key areas of development such as communication, gross motor, fine motor, problem-solving, and personal-social skills.

+ Nutritional status of children: Information on anthropometric indicators of children (weight, height) at the time of follow-up (6, 12 months old) was collected to assess nutritional status (malnutrition, weight by age, height by age, weight by height).

2.3.4. Research Variables

The variables in this study were identified and information was collected according to each stage of the study, in order to achieve the set objectives.

2.3.5. Information collection methods

The process of collecting information in the study was carried out systematically through two main stages, using standardized tools and a team of well-trained researchers/investigators to ensure the accuracy and reliability of the data.

2.3.6. Methods of data processing and analysis

All data collected from the study are examined, cleaned, and entered using Epidata 3.1 software. After completing data entry and error checking, the data base is converted and analyzed using SPSS statistical software version 22.0. The analysis process is carried out according to each specific objective as follows:

2.4. RESEARCH ETHICS

The study was approved by the Ethics Council for Biomedical Research of the University of Medicine and Pharmacy, Hue University under code H2020/503 dated October 20, 2022. Throughout the implementation, the research team strictly adhered to the ethical and safety guidelines for domestic violence research of the World Health Organization (WHO, 2001).

Chapter 3
RESEARCH RESULTS

3.1. GENERAL INFORMATION OF THE RESEARCH OBJECT

3.1.1. Demographic characteristics of pregnant women

The age group of women accounted for the highest proportion of 25 to 35 years old (70.7%). In terms of ethnicity, the vast majority of subjects are Kinh people (99.4%). The proportion of people who do not follow any religion dominates (93.5%). The group with an education level above high school accounted for the largest proportion (56.6%). In terms of occupation, the group of officials and office workers had the highest rate (51.5%), followed by the group of workers (12.7%) and freelancers (11.0%). There are 5.7% of the study subjects are poor and near-poor households.

3.2. THE CURRENT SITUATION OF HUSBAND VIOLENCE DURING PREGNANCY IN DA NANG CITY

3.2.1. Rate of violence caused by husband during pregnancy in Da Nang city

Table 3.7. *Rates of violence against women during pregnancy in Da Nang city*

Abuse	Quantity(n)	Rate (%)
Have	406	32,9
Not	829	67,1
Total	**1235**	**100,0**

The rate of violence against women during pregnancy in Da Nang city accounted for 32.9%.

Table 3.8. *Rates of forms of violence caused by husbands during pregnancy in Da Nang city*

Abuse		Quantity(n)	Rate (%)
Physical abuse	Have	182	14,7
	Not	1053	85,3
Emotional abuse	Have	332	26,9
	Not	903	73,1
Sexual violence	Have	154	12,5
	Not	1081	87,5
Total		**1235**	**100,0**

14.7% of pregnant women experienced physical violence, 26.9% experienced emotional violence, and 12.5% experienced sexual violence during pregnancy.

5.7% of pregnant women experienced three different forms of violence throughout pregnancy. There were 6.9% of women who suffered simultaneous physical and sexual violence. 8.6% said they had experienced a combination of mental and sexual violence. 11.4% said they had experienced a combination of mental and physical abuse.

3.2.2. Factors related to the rate of violence caused by husband during pregnancy in Da Nang city

Table 3.19. *Logistic multivariate regression model of the rate of violence caused by the husband during pregnancy*

Reference group	OR	KTC95%	p
Husband's education level			
Below high school	1,87	1,13-3,11	**0,016**
High School	1,20	0,89-1,62	0,237
In high school	1		
Husband's occupation			
Officials and office staff	1		
Worker	1,97	1,41-2,76	**<0.001**

Reference group	OR	KTC95%	p
Freelance workers	0,87	0,59-1,30	0,499
Other occupations	1,38	0,86-2,24	0,184
Husband uses alcohol			
Have	1,40	1,06-1,84	**0,016**
Not	1		
Planned childbirth			
Have	1		
Not	1,13	0,82-1,55	0,455
Multiple pregnancies			
Have	1,84	1,12-3,01	**0,015**
Not	1		
Regular prenatal check-ups			
Have	1		
Not	1,96	1,14-3,37	**0,016**
Supplement with iron tablets and multivitamins			
Have	1		
Not	1,12	0,60-2,10	0,724
Fetal ultrasound			
Have	1		
Not	1,58	0,99-2,52	0,055
Alcohol use in women			
Have	1,40	0,88-2,23	0,151
Not	1		
Have had an abortion			
Never before	1		
1 time	1,73	1,07-2,80	**0,025**
More than 1x	6,47	2,20-18,99	**0,001**
Depression			
Have	1,24	0,92-1,68	0,156
Not	1		
Social Support			
Low	1		
Moderate	1,19	0,64-2,22	0,585
High	0,82	0,44-1,56	0,536
Adverse Childhood Experiences			
Have	2,88	2,14-3,89	**<0.001**
Not	1		

Husband's education level: Husbands with education below high school are 1.87 times more likely to be abused (OR = 1.87; 95% CI: 1.13-3.11).

Husband's occupation: Women whose husbands are workers are 1.97 times more likely to be abused (OR = 1.97; 95% CI: 1.41-2.76).

Husbands who use alcohol: Women whose husbands use alcohol are 1.40 times more likely to be abusive (OR = 1.40; 95% CI: 1.06-1.84)

Multiple pregnancies: Multiple pregnancies have a 1.84 times higher risk of violence (OR = 1.84; 95% CI: 1.12-3.01; p = 0.015).

Frequency of prenatal check-ups: Women who do not have adequate prenatal check-ups are 1.96 times more likely to be abused (OR = 1.96; 95% CI: 1.14-3.37).

Abortion history: Women who have had 1 abortion are 1.73 times more likely to be abused (OR = 1.73; 95% CI: 1.07-2.80), having had more than 1 abortion had a 6.47 times higher risk of violence (OR = 6.47; 95% CI: 2.20-18.99).

Adverse childhood experiences: Women with adverse childhood experiences were 2.88 times more likely to be abusive (OR = 2.88; 95% CI: 2.14-3.89).

3.3. ASSESSMENT OF THE IMPACT OF HUSBAND VIOLENCE DURING PREGNANCY ON MATERNAL BIRTH OUTCOMES AND POSTPARTUM DEPRESSION IN DA NANG CITY

3.3.1. Impact of husband violence during pregnancy on adverse birth outcomes

There were 59.8% of mothers who had a cesarean section and 1.2% had obstetric complications (5 mothers with hemorrhage accounted for the highest rate with 0.7% and 4 mothers with postpartum infection accounted for 0.5%.

Table 3.21. *The impact of husband's violence during pregnancy on maternal outcomes (n=753)*

Character		Obstetric complications		RR	p
		Yes n (%)	No n (%)	CI 95%	
p-IPV	Have	6 (2,7)	216 (97,3)	4,78	**0,022**
	Not	3 (0,6)	528 (99,4)	(1,21-18,95)	
		Birth form			
		Normal birth n (%)	**Caesarean section n (%)**		
p-IPV	Have	92 (41,4)	130 (58,6)	1,04	0,664
	Not	211 (39,7)	320 (60,3)	(0,86-1,26)	

Pregnant women who are subjected to any kind of violence are 4.78 times more likely to develop an obstetric complication than those who are not abused. Obstetric complications were 2.7% in the abusive group (4 mothers with hemorrhages and 2 mothers with postpartum infections) compared to 0.6% in the non-abusive group (1 mother with bleeding and 2 mothers with postpartum infection).

The proportion of boys (54.4%), girls (45.6%). The rate of premature babies (9.3%), the rate of underweight children (7.4%), and the rate of children with low APGAR (2.1%).

Table 3.23. *Impact of Pregnancy Husband Violence on Child Birth Outcomes (n=753)*

Character		**Premature birth**		**RR KTC 95%**	**p**
		Yes n (%)	**No n (%)**		
p-IPV	Have	41 (18,5)	181 (81,5)	3,38 (2,16-5,30)	**<0.001**
	Not	29 (5,5)	502(94,5)		
		Low weight			
		Yes n (%)	**No n (%)**		
p-IPV	Have	35 (15,8)	187 (84,2)	3,99 (2,38-6,69)	**<0.001**
	Not	21 (4,0)	510 (96,0)		
		APGAR			
		Normal n (%)	**Short n (%)**		
p-IPV	Have	209 (94,1)	13 (5,9)	10,37 (2,98-36,02)	<0.001
	Not	528 (99,4)	3 (0,6)		

Pregnant women exposed to any kind of violence had a 3.38-fold higher risk of preterm birth than those without exposure, p<0.001.

Pregnant women exposed to any kind of violence had a 3.99-fold higher risk of low birth weight infants than those without exposure, p<0.001.

Pregnant women with any exposure to violence had 10.37-fold higher risk of having a low APGAR score, p<0.001.

3.3.2. The impact of husband violence during pregnancy on maternal postpartum depression in Da Nang city

The rate of depression at 6 months postpartum was 25.4%. The rate of depression at 12 months postpartum was 30.7%.

Table 3.25. *The impact of husband violence during pregnancy on depression at 6 months and 12 months postpartum in Da Nang city*

Character		**Depression 6 months postpartum (n=753)**		**RR KTC 95%**	**p**
		Yes n (%)	**No n (%)**		
p-IPV	Have	68 (30,6)	154 (69,4)	1,32 (1,03-1,70)	**0,032**
	Not	123 (23,2)	408 (76,8)		
		Depression 12 months postpartum (n=638)			
		Yes n (%)	**No n (%)**		
p-IPV	Have	71 (37,4)	119 (62,6)	1,34 (1,06-1,70)	**0,018**
	Not	125 (27,9)	323 (72,1)		

Pregnant women exposed to any kind of violence had a 1.32-fold higher risk of postpartum depression at 6 months than those without exposure, p=0.032. Pregnant women exposed to any kind of violence had a 12-month higher risk of postpartum depression than those without exposure, p=0.018.

3.3.3. Impact of husband violence during pregnancy on child development in Da Nang city

Evaluation at the time after 6 months of age showed that the proportion of children with suspected developmental delay was 12.6% in the study sample (n=753). The results of the assessment at 12 months of age showed that the proportion of children with suspected developmental delays was 16.8% in the study sample (n=638).

Table 3.27. *The impact of husband violence during pregnancy on developmental disorders of children at the age of 6 months and 12 months in Da Nang city*

Character		**Developmental disorders of 6-month-old babies (n=753)**		**RR KTC 95%**	**p**
		Suspected developmental delay n (%)	Not n (%)		
p-IPV	Have	43 (19,4)	179 (80,6)	1,98 (1,36 – 2,87)	**<0.001**
	Not	52 (9,8)	479 (90,2)		
		Developmental disorders of 12-month-old babies (n=638)			
		Suspected developmental delay n (%)	Not n (%)		
p-IPV	Have	47 (24,7)	143 (75,3)	1,85 (1,31-2,60)	**<0.001**
	Not	60 (13,4)	388 (86,6)		

Pregnant women exposed to any kind of violence had a 1.98-fold higher risk of developmental disorders in their 6-month-old babies than those without exposure, p<0.001. Pregnant women exposed to any kind of violence had a 1.85-fold higher risk of developmental disorders in their 12-month-old babies than those without exposure, p<0.001.

3.3.4. The impact of husband violence during pregnancy on the nutritional status of children

3.3.4.1. Impact of husband violence during pregnancy on malnutrition in 6-month-old children in Da Nang city

The results of the assessment at the time after 6 months of age showed that the prevalence of underweight malnutrition was 11.2% in the study sample (n=753). The results of the assessment at the time after 6 months of age showed that the prevalence of stunted infants was 20.8% in the study

sample (n=753). The results of the assessment at the time after 6 months of age showed that the prevalence of malnourished children was 12.1% in the study sample (n=753).

***Table 3.29**. Impact of husband violence during pregnancy on child malnutrition at 6 months of age in Da Nang city (n=753)*

Character		**Underweight malnutrition**		**RR KTC 95%**	**p**
		Yes n (%)	**Not n (%)**		
p-IPV	Have	34 (15,3)	188 (84,7)	1,63 (1,08-2,44)	**0,019**
	Not	50 (9,4)	481 (90,6)		
		Stunting malnutrition			
		Yes n (%)	**No n (%)**		
p-IPV	Have	58 (26,1)	164 (73,9)	1,40 (1,06-1,86)	**0,021**
	Not	99 (18,6)	432 (81,4)		
		Malnutrition			
		Yes n (%)	**No n (%)**		
p-IPV	Have	28 (12,6)	194 (87,4)	1,06 (0,70-1,61)	0,774
	Not	63 (11,9)	468 (88,1)		

Pregnant women exposed to any kind of violence had a 1.63-fold higher risk of low birth weight in their 6-month-old infants than those without exposure, p=0.019.

Pregnant women exposed to any kind of violence had a 1.40-fold higher risk of stunting in their 6-month-old infants than those without exposure, p=0.021.

Pregnant women exposed to violence had a 1.06-fold higher risk of malnutrition in their 6-month-old infants than those without exposure, but there was no statistical significance of p=0.774.

3.3.4.2. The impact of husband violence during pregnancy on the nutritional status of children at the age of 12 months in Da Nang city

The results of the assessment at the time after 12 months of age showed that the prevalence of underweight malnourished children was 9.1% in the study sample (n=638). The results of the assessment at the time after 12 months of age showed that the prevalence of stunted children was 17.1% in the study sample (n=638). The results of the assessment at the time after 12 months of age showed that the prevalence of malnourished children was 8.5% in the study sample (n=638).

Table 3.31. *The impact of husband violence during pregnancy on child malnutrition at 12 months of age in Da Nang city (n=638)*

Character		Underweight alnutrition		RR KTC 95%	p
		Yes n (%)	**Not n (%)**		
p-IPV	Have	24 (12,6)	166 (87,4)	1,66 (1,02-2,73)	**0,043**
	Not	34 (7,6)	414 (92,4)		
		Stunting malnutrition			
		Yes n (%)	**No n (%)**		
p-IPV	Have	45 (23,7)	145 (76,3)	1,66 (1,18-2,33)	**0,004**
	Not	64 (14,3)	384 (85,7)		
		Malnutrition			
		Yes n (%)	**No n (%)**		
p-IPV	Have	24 (12,6)	166 (87,4)	1,89 (1,13-3,14)	**0,014**
	Not	30 (6,7)	418 (93,3)		

Pregnant women exposed to any violence had a 1.66-fold higher risk of low birth weight in their 12-month-old infants (95% CI: 1.02-2.73) compared to no exposure, p=0.043.

Pregnant women exposed to any kind of violence had a 1.66-fold higher risk of stunting in their 12-month-old infants (95% CI: 1.18-2.33) compared to no exposure, p=0.004.

Pregnant women exposed to any kind of violence had a 1.89-fold higher risk of malnutrition in 12-month-old infants (95% CI: 1.13-3.14) compared to no exposure, p=0.014.

Chapter 4
DISCUSSION

4.1. GENERAL INFORMATION OF THE RESEARCH OBJECT

In the study, the predominant age of pregnant women (70.7% from 25-35 years old) and their husbands (64.6% from 25-35 years old) was consistent with the common reproductive age in Vietnam and many other countries. The high proportion of women with education above high school (56.6%) and working in office jobs (51.5%) may reflect the characteristics of the population in Da Nang. This is also similar to the education of the husband (55.9% in high school). However, the occupational structure of husbands is more diverse with a high proportion of workers (31.0%) and freelancers (22.1%), indicating differences in economic roles in the family. The proportion of Kinh people who make up the absolute majority (99.4%)

reflects the ethnographic characteristics of many regions in Vietnam, however it should be noted that this result may not be representative of areas inhabited by a large number of ethnic minorities.

It is worth noting that nearly 60% of husbands use alcohol. This rate is quite high and is consistent with reports of alcohol use among Vietnamese men, which is a public health concern. Husband's use of alcohol can affect the risk of domestic violence.

4.2. THE CURRENT SITUATION OF VIOLENCE CAUSED BY HUSBAND DURING PREGNANCY IN DA NANG CITY

4.2.1. Prevalence of husband-perpetrated violence during pregnancy in Da Nang city

The results of our study in Da Nang city show a worrying rate of husband violence during pregnancy, accounting for 32.9%. When compared to other studies in Vietnam on husband violence during pregnancy, this rate is between the highest recorded in Hanoi of 35.3% and the lowest level of 17.3% in Hue. The results are different from some countries in the world such as Canada (24.07%) and Iran (51.5%). There are studies that show that p-IPV is on the rise in recent years 2020-2022. This shows that husband abuse during pregnancy is a local problem and requires special attention in Da Nang.

Regarding physical violence, it accounted for 14.7%. Compared to other studies in the country, this rate is higher than that of N.T.T Trang (2019) in Quang Nam province with a rate of 8.1%, as well as studies in Ho Chi Minh City (7.3%). However, the results are similar to the study of P.N.L Phuong (2021) also in Da Nang city, which recorded a rate of 20.8% of physical violence. L.T.B. Yen's research in Hue city also shows that the rate of physical violence is very low, only 2.0%, further highlighting the differences between localities in the country. When compared to the international context, a study in Ethiopia in 2020 showed that the unemployment insurance rate among pregnant women was 25.93%. This difference can reflect cultural, economic and social diversity between countries and regions, influencing perceptions and behaviors of violence.

For mental violence, it accounted for 26.9%, similar to the 26.0% result from P.N.L Phuong's study (2021) in Da Nang. However, this rate is higher than the study in Ho Chi Minh City (16.8%) and the South Central provinces (14.0%). A study by T.T Nhi (2018) in Hanoi also showed a high rate, with 50.4% of pregnant women having experienced at least one type of emotional violence. The highest rate of emotional violence in central Vietnam in the studies compared was in Phu Ninh district, Quang Nam province, with 47.1%. When compared to the international context, there were 25.62% in Ethiopia in 2020.

The study recorded that 12.5% of pregnant women suffered from sexual abuse This rate is similar to the study of N.T.T Trang (2019) with a rate of 12.6% and the study of P.N.L Phuong (2021) in Da Nang with 11.6%. At the same time, this rate is higher than the study of Vo MT (2016) with 12.4% and L.T.B. Yen with a very low rate of 1.3%. This discrepancy may be due to the sensitivity of the issue of sexual violence, which makes it difficult to collect accurate and complete data.

4.2.2. Factors related to the rate of violence caused by husband during pregnancy in Da Nang city

4.2.2.1. The relationship between husband characteristics and the rate of violence caused by the husband during pregnancy

Research conducted in Da Nang showed that women whose husbands studied below the high school level were 2.3 times more likely to be abused, while this figure was 1.4 times higher in the group of husbands who completed high school, compared to those whose husbands studied above high school. This result is statistically significant ($p<0.001$ and $p=0.009$), and is consistent with the trend recorded in previous domestic and foreign studies.

Our study also shows that husbands who work as workers are 1.9 times more likely to be abused than husbands who are officials and employees (OR=1.90, $p<0.001$). The link between husband's occupation and abuse has also been mentioned in other studies. Research by N.T.T. Trang et al. (2019) shows that women's economic dependence on their husbands is associated with violence between couples. The 2013 review also pointed out that husband unemployment is a factor that increases the risk of violence against pregnant women.

Finally, our study found that husbands who used alcohol were 1.45 times more likely to be abusive than non-users (OR=1.45, $p<0.003$). The link between her husband's alcohol use and abuse has been proven.

4.2.2.2. The association between health conditions and the rate of violence caused by the husband during pregnancy

Giving birth without planning has a 1.7 times higher risk of violence than planned childbirth, which is statistically significant (OR=1.71, 95% CI: 1.29-2.27). Similarly, research by Simukai Shamu (2018) has shown an association between P-IPV and unintended pregnancy (OR: 1.31–2.02), suggesting a complex correlation between the timing of pregnancy and the risk of violence.

Women with multiple pregnancies are 1.8 times more likely to be abused than single pregnancies (OR=1.82; 95% CI: 1.17–2.82; $p=0.008$). Not having regular prenatal check-ups/ultrasounds can be a sign of being

controlled, isolated, or lacking support from the husband. Women who have been abused may have difficulty accessing health care services due to obstruction by their husbands, lack of transportation, or mental health issues related to violence.

Women who used alcohol were 1.58 times more likely to be abused than those who did not, with a statistically significant OR=1.58 (95% CI:1.04-2.41). Women who have had an abortion once are 2.7 times more likely to be abused, and if they have had more than one abortion, the risk increases to 7.4 times that of those who have never had an abortion.

4.2.2.3. The association between social support and the rate of violence caused by the husband during pregnancy

Our study found that women with moderate levels of social support were 1.7 times more likely to be subjected to violence than those with high levels of social support. This finding is consistent with many other studies that show the protective role of social support for pregnant women against the risk of violence. Research by N.T Hoang (2018) in Vietnam even showed that pregnant women without social support were 3.1 times more likely to suffer from p-IPV at least once and 2.9 times more often.

4.2.2.4. The association between adverse childhood experiences and the rate of violence caused by the husband during pregnancy

Our research shows that women who have had adverse childhood experiences are 3.1 times more likely to be abused. The National Survey on Violence against Women in Viet Nam in 2019 and 2010 also found that women who have been forced to have sex for the first time or witnessed their mothers being abused as children are at greater risk of sexual assault. higher violence.

4.3. ASSESSMENT OF THE IMPACT OF HUSBAND-INDUCED VIOLENCE DURING PREGNANCY ON MATERNAL BIRTH OUTCOMES AND POSTPARTUM DEPRESSION IN DA NANG CITY

4.3.1. The impact of husband violence during pregnancy on adverse birth outcomes

The impact of husband abuse during pregnancy on Obstetric complications

Pregnant women who were abused were 4.78 times more likely to have obstetric complications than those without violence (RR=4.78; KTC95%:1.21-18.95). Our research in Da Nang shows a worrying link between husband-induced violence during pregnancy and the risk of obstetric complications (postpartum haemorrhage and postpartum infections). Specifically, pregnant women were exposed to violence when considering any form of violence, this risk increased by 4.78 times (RR=4.78), suggesting that violence had a significant negative impact on maternal obstetric health.

The impact of husband violence during pregnancy on birth patterns

The link between violence and birth control is not a new finding and has been documented in many other studies around the world. A longitudinal cohort study conducted in Sweden from 2012-2014 on 1939 pregnant women has shown that general violence increases the risk of cesarean section

The impact of husband-induced violence during pregnancy on premature birth

Pregnant women who were abused were 3.38 times more likely to have premature birth than those without violence (RR=3.38; 95% CI: 2.16-5.30). This suggests that violence during pregnancy is an important risk factor for preterm birth. Our findings on the association between violence and preterm birth are in line with many other studies conducted both in Vietnam and around the world.

The impact of husband abuse during pregnancy on low birth weight

Pregnant women who have been abused have a 3.99-fold higher risk of low birth weight than those without violence (RR=3.99; 95% CI: 2.38-6.69). Our study in Da Nang showed an association between husband abuse during pregnancy and the risk of having a low birth weight (birth weight less than 2500 grams). Specifically, pregnant women who suffer from any form of violence, the risk of giving birth to a low birth weight increases by 3.99 times (RR=3.99), suggesting that violence in pregnancy is an important risk factor for low birth weight in infants.

Impact of Pregnancy Husband Violence on APGAR Index

Our study in Da Nang showed an association between husband-induced violence during pregnancy and low APGAR in infants. Specifically, pregnant women exposed to any form of violence, the risk of giving birth to a child with a low APGAR index increased significantly by 10.37 times, indicating that violence during pregnancy has a serious negative impact on the health of the newborn immediately after birth.

4.3.2. The impact of husband violence during pregnancy on maternal postpartum depression in Da Nang city

The results of the study showed that pregnant women who were abused had a 1.32-fold higher risk of postpartum depression at 6 months compared to those without violence (RR=1.32; 95% CI: 1.03-1.70). Pregnant women who were abused had a 1.3-fold higher risk of depression 12 months postpartum than those without violence (RR=1.30; 95% CI: 1.02-1.66).

The results of our study showed that the association between husband abuse during pregnancy and the risk of depression 6 months after giving birth

was 1.32 times higher. The longitudinal study in Hanoi also noted the association between sexual violence and postpartum depression (OR = 1.93), here 2023 shows that health insurance is related to TCSS.

Maintaining a high risk of postpartum depression at 12 months suggests that the negative effects of violence during pregnancy can be long-lasting and profoundly affect maternal depression. The physical and emotional trauma caused by violence may take longer to recover, and motherhood difficulties may be exacerbated by previous experiences of violence. The lack of ongoing support and the socio-economic problems associated with violence can also contribute to long-term depression.

4.3.3. Children's development in Da Nang city

Baby development in 6 and 12 months after birth

Our research in Da Nang shows that husband abuse during pregnancy has a significant negative impact on a child's development in the 6 and 12 months postpartum. At 6 months of age: The percentage of children with developmental disorders is 12.6%. Babies whose mothers have experienced any form of violence during pregnancy have a significantly higher risk of developmental disorders (RR=1.98). At 12 months of age: The percentage of children with developmental disorders increased to 16.8%. The risk of developmental disorders in children whose mothers have been abused remained high, although the RR had a slight change compared to 6 months (any form: RR=1.85).

All of these results were statistically significant ($p<0.05$), suggesting that violence in pregnancy is an important risk factor for early child development.

Nutritional status of children

At the age of 6 months, violence increases the risk of underweight malnutrition by 1.63 times and stunted malnutrition by 1.4 times. At 12 months of age, violence increases the risk of underweight malnutrition by 1.66 times and stunted malnutrition by 1.66 times. All of these results are statistically significant, suggesting that violence during pregnancy is a risk factor for a child's nutritional status in early life. This evidence has supported findings from previous studies around the world that there is a link between maternal violence and malnutrition, emaciation and stunting. However, Issah's (2022) findings suggest that maternal domestic violence is associated with underweight (RR = 0.63; 95% CI: 0.44, 0.91) and overweight/obese (RR = 1.28; 95% CI: 1.04, 1.58), all of which contribute to providing existing evidence that there may be pathways other than maternal behaviour that are strongly related to the child's health outcomes.

CONCLUSION

A cohort study conducted in Da Nang city from pregnancy to 12 months postpartum provided evidence of violence during pregnancy and its impact on birth outcomes, maternal depression and postpartum development.

1. The current situation of violence caused by husband during pregnancy in Da Nang city and some related factors

1.1. Rate of violence by husband during pregnancy in Da Nang city

The rate of violence by husbands during pregnancy was 32.9%. In which, emotional violence was the most common (26.9%), followed by physical violence (14.7%) and sexual violence (12.5%).

1.2. Factors related to violence (p<0,05)

Husbands with education below high school are 1.87 times more likely to be abused

Women whose husbands are workers are 1.97 times more likely to be subjected to violence

Married women who use alcohol are 1.40 times more likely to be abused.

In the case of multiple pregnancies, the risk of violence is 1.84 times higher.

Women who did not have adequate prenatal check-ups were 1.96 times more likely to be abused.

Women who had 1 abortion were 1.73 times more likely to be violent, and those who had more than 1 abortion had a 6.47 times higher risk of violence.

Women who had adverse childhood experiences were 2.88 times more likely to be abused.

2. Assess the impact of husband-induced violence during pregnancy on maternal birth outcomes, postpartum depression and child development in Da Nang city

In terms of birth outcomes, pregnant women who were abused had a higher risk of obstetric complications than those who were not abused (RR = 4.78; $p < 0.05$). At the same time, the risk of preterm birth (RR = 3.38; $p < 0.001$), low birth weight (RR = 3.99; $p < 0.001$) and low APGAR (RR = 10.37; $p < 0.01$) were all significantly increased.

For postpartum depression, violence during pregnancy increases the risk of maternal depression at both 6 months (RR = 1.32; $p < 0.05$) and 12 months postpartum (RR = 1.30; $p < 0.05$).

In terms of child development, children of mothers who were abused during pregnancy had a higher risk of developmental disorders at 6 months (RR = 1.98; $p < 0.001$) and 12 months (RR = 1.85; $p < 0.001$)

In addition, violence during pregnancy increases the risk of malnutrition in babies, including underweight, stunting, and emaciation, with RRs ranging from 1.40 to 1.89 at 6 and 12 months of age ($p < 0.05$).

RECOMMENDATIONS

Stemming from difficulties in the research process, especially monitoring maternal and infant health in the postpartum period, along with the evidence obtained on the reality and impact of husband abuse during pregnancy (p-IPV) on maternal and infant health, we propose a number of specific recommendations to prevent, detect early, intervene promptly and minimize the impact of violence in Da Nang city.

1. For local health agencies and Women's Unions

Implement routine screening for mental, physical and sexual abuse using the CTS-2 scale in pregnancy management, childbirth and postpartum care; at the same time, organize training and training for medical staff on skills to identify, consult, support and transfer p-IPV cases, ensuring the principles of confidentiality and respect for women.

Coordinate with the Women's Union and social organizations to promote communication on the consequences of violence in pregnancy, promote gender equality; building and maintaining peer support groups and community counseling to detect early, intervene promptly and support women to access rights protection services.

2. For officials directly performing violence prevention and control in their localities

Organize postpartum depression screening using the PHQ-9 scale at 6 and 12 months, giving priority to women with a history of p-IPV; continuously monitor and manage high-risk cases.

Strengthen nutrition monitoring, early development screening with ASQ-3, and implement appropriate rehabilitation interventions to minimize the long-term effects of p-IPV in the first 1000 days of life.

3. For families, pregnant women and husbands

Encourage the active involvement of husbands in emotional, emotional, and material support for pregnant women, contributing to reducing the risk and consequences of violence during pregnancy.

Encourage pregnant women to actively seek support from the health system and social services when there are signs of violence; at the same time, raise awareness about safe pregnancy planning and childbirth.

4. Policy recommendations

Include p-IPV screening and intervention in maternal and child health care programs to ensure sustainability and synchronization in implementation.

Establish a long-term monitoring mechanism for mothers and children affected by p-IPV to comprehensively assess physical, mental and developmental health indicators, as a basis for appropriate policy making and interventions.

LIST OF PUBLISHED RESEARCH WORKS OF AUTHORS RELATED TO THE THESIS

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2. Tran Dinh Trung, Vo Van Thang, Nguyen Vu Quoc Huy (2025), Prenatal depression and some related factors in pregnant women in the last 3 months in Da Nang city in 2023, *Journal of Preventive Medicine*. Volume 35, No. 1, pp. 46-53.
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