

THESIS
THE RELATIONSHIP BETWEEN EXPOSURE TO CIGARETTE SMOKE
IN THE ENVIRONMENT AGAINST THE INCIDENCE OF ANEMIA
IN PREGNANT WOMEN AT THE BERINGIN RAYA CITY
HEALTH CENTER BENGKULU YEAR 2026



Compiled by:

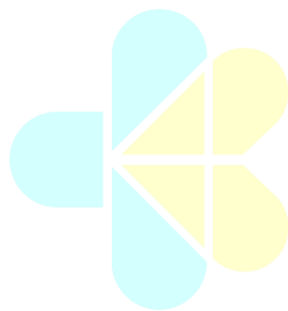
MELA APRIANA DEWI
Student id: P01720322080

MINISTRY OF HEALTH OF THE REPUBLIC OF INDONESIA
HEALTH POLYTECHNIC OF THE MINISTRY OF HEALTH
BENGKULUAPPLIED BACHELOR OF NURSING STUDY
PROGRAM NURSING DEPARTMENT
YEAR 2025/2026

THESIS TITLE PAGE

**THE RELATIONSHIP BETWEEN EXPOSURE TO CIGARETTE SMOKE
IN THE ENVIRONMENT AGAINST THE INCIDENCE OF ANEMIA
IN PREGNANT WOMEN AT THE BERINGIN RAYA CITY
HEALTH CENTER BENGKULU YEAR 2026**

Submitted as one of the requirements to obtain an Applied Bachelor of Nursing
(STr) in the Applied Bachelor of Nursing Study Program, Department of Nursing
Polytechnic, Ministry of Health, Bengkulu



Compiled by:

MELA APRIANA DEWI
Student id: P01720322080

**MINISTRY OF HEALTH OF THE REPUBLIC OF INDONESIA
BENGKULUSARJANA HEALTH POLYTECHNIC
APPLIED NURSING MAJORS
NURSING SCHOOL YEAR
2025/2026**

THESIS APPROVAL PAGE

THE RELATIONSHIP BETWEEN EXPOSURE TO CIGARETTE SMOKE IN THE ENVIRONMENT AGAINST THE INCIDENCE OF ANEMIA IN PREGNANT WOMEN AT THE BERINGIN RAYA CITY HEALTH CENTER BENGKULU YEAR 2026

Prepared and presented by:

Compiled by:

MELA APRIANA DEWI

Student id: P01720322080

Applied Bachelor of Nursing Study Program, Department of Nursing
Polytechnics, Ministry of Health, Bengkulu

Date: June 23, 2026

Thesis Supervisor

Supervisor I



Dr. Nur Elly, S.Kp., M.Kes
NIP 196311281986032001

Supervisor II



Ns. Kheli Fitria A., M.Kep., Sp.Kep. Mat
PIN 198307132010012008

THESIS CONFIRMATION PAGE

**THE RELATIONSHIP BETWEEN EXPOSURE TO CIGARETTE SMOKE
IN THE ENVIRONMENT AGAINST THE INCIDENCE OF ANEMIA IN
PREGNANT WOMEN AT THE BERINGIN RAYA CITY HEALTH
CENTER BENGKULU YEAR 2026**

Compiled by:

MELAPRIANA DEWI

NIM: P01720322080

Has been tested in front of the Thesis Examiner, Applied Undergraduate Study
Program, Department of Nursing, Polytechnic, Ministry of Health, Bengkulu

On : July 8, 2026, With a grade of 84,25

**Chairman of the Board of
Examiners**


Ns. Mardiani, S.Kep.,MM
NIP. 197203211995032001

Supervisor 1


Dr. Nur Elly, S.Kp., M.Kes
NIP. 196311281986032001

Tester 1


Ns. Husni, S.Kep.,M.Pd
NIP. 1974120619970320001

Supervisor 2


Kheli Fitria.A, M.Kep., Sp. Kep. Mat
NIP. 198307132010012008

This thesis has met one of the requirements to achieve a Bachelor of Applied
Nursing degree

Know:

Head of the Applied Nursing Undergraduate Study Program, Ministry of Health,
Bengkulu



Ns. Hendri Heriyanto. S.Kep.,M.Kep
BITE. 198205152002121004

BIODATA



Name : Mela Apriana Dewi

Place, Date of Birth : Manna, April 11, 2004

Religion : Islam

Gender : Women

The Son of Man : 6 (Six)

Education History : 1. SD N 96 South Bengkulu
2. SMP N 05 South Bengkulu
3. SMA N 09 South Bengkulu

Address : Padang Lakaran Hamlet, Pasar Pino Village, Pino Raya
District, South Bengkulu Regency

E-mail : melaaprianadewi04@gmail.com

STATEMENT OF ORIGINALITY

The undersigned :

Name : Mela Apriana Dewi
Student id : P0172032208
Thesis Title : The Relationship of Exposure to Cigarette Smoke
in the Environment to the Incidence of Anemia in
Pregnant Women at the Beringin Raya Health
Center, Bengkulu City in 2026

Stating that this is my own work (ORIGINAL), and the content of this thesis does not contain any work that has ever been submitted by others to obtain an academic degree in an educational institution, and to the best of my knowledge there are also no works or opinions that have been written and/or published by others, except those that are referred to in writing in this manuscript and mentioned in the bibliography.

Thus this statement and if in the future it is proven in the thesis that there is an element of plagiarism, then I am willing to take responsibility in accordance with the applicable regulations.

Bengkulu,
Which states,



Mela Apriana Dewi
Student id: P01720322080

PRESENTATION

Motorcycles:

"Although the process is tiring, with Bismillah, God willing, every step will end with Alhamdulillah."

-Mela Apriana Dewi-

Presentation :

I present this thesis to:

1. With full gratitude, I dedicate this simple work to: Allah SWT. for all the graces, favors, guidance, convenience, and strength that have been given so that the author can complete this thesis. There is no power and effort except with Your help.
2. Prayers and greetings are always poured out to the Prophet Muhammad PBUH, the best example for all mankind, who has brought the light of knowledge, faith, and noble morals as a guide in life.
3. To my beloved mother, thank you for the love that never knows borders, for the prayers that always accompany my every step, and for the affection that never diminishes even though time goes on. Thank you for always believing in me even when I doubt myself. Thank you for always being the warmest place to go home, the most comfortable place to tell stories, and a never-ending source of strength. If today I am able to complete this journey, it is because there is Mama's prayer that continues to flow in your every prostration. There are no words enough to describe how precious Mama was in my life. I dedicate this work with love to you, Mama. May every success of mine be a happiness that erases the fatigue and tears that you once hid for your child.
4. For my first love, My Father. Thank you for the love that may not always be expressed, but I will always feel it through every sacrifice and hard work that you do. Thank you for always being a strong and steadfast figure for my family, for teaching me the meaning of hard work and responsibility, and for never stopping fighting and sacrificing for my future. Thank you for being my greatest protector, encouragement, and supporter in every journey of my life.

No gift can match everything you have given. I dedicate this work with full respect, love, and gratitude to you. Hopefully this work can be one of the reasons for the presence of a proud smile on your face and be proof that every struggle and sacrifice you have made is not in vain. With love and gratitude, thank you for everything you have given. May Allah SWT always bestow health, happiness, and blessings in every step of your life.

5. For Dear Brothers, the Author dedicates this simple work to my beloved brothers, Dang, Ayuk, Dodo, and Inga. The author would like to thank you for all the prayers, support, attention, and affection that has always been given. Thank you for being a part of every process of the writer's journey, giving encouragement in times of tiredness, and always believing in the writer's ability to solve every challenge that exists. This simple work is presented by the author as a form of gratitude and appreciation for all the kindness that has been given. May this achievement be a source of happiness and pride for you, as you have always been a source of strength for writers.
6. To the author's first supervisor, Mrs. Dr. Nur Elly, S.Kp., M.Kes. With great respect and gratitude, the author would like to thank you for the time, energy, thoughts, and patience that you have devoted during the process of preparing this thesis. The direction, input, criticism, and suggestions provided are valuable provisions for the author, not only in completing this research, but also in fostering perseverance, responsibility, and enthusiasm to continue learning. The author is grateful to be guided by such a kind, sincere, and dedicated figure. All the knowledge and kindness that you have given will always be a valuable part of the writer's journey. May Allah SWT repay every kindness of your mother with blessings, health, and happiness.
7. To the two authors' supervisors, Mrs. Ns. Kheli Fitria A., M.Kep., Sp.Kep.Mat., the author would like to express her sincere gratitude for the guidance, support, and direction that she has given during the process of preparing this thesis. Every input and suggestion given is a valuable provision for the author in completing this research properly. The knowledge, attention, and kindness that you have given will always be memories and valuable lessons in the writer's

academic journey. May Allah SWT always bestow health, blessings, happiness, and repay all your kindness with the best return.

8. To the writer's best friend, Ivo Risa Putri Gandari, Thank you for being an important part of the author's journey. Thank you for the togetherness, laughter, attention, and support that is always there, both in good times and in difficult times. Many moments we have gone through together, from simple things to small stories full of laughter. Your presence is not just as a friend, but as a friend who is always there to listen, strengthen, and make days feel lighter. Thank you for accompanying me so far. All these memories will always be a precious part that will never be forgotten.
9. To the writer's dear friend, Ms. Ferlinda, thank you for being a place to go home in the form of a friend. Thank you for always being willing to listen to every story, complaint, and anxiety of the author without ever judging. Thank you for strengthening the writer when he feels not well, as well as being a figure who always reminds that every process will find an end. We have gone through many things together, and the author is grateful to have friends like Mbak during the lecture period.
10. To the writer's best friend, Irfan, thank you for accompanying the writer during this lecture journey. Thank you for all the help, support, enthusiasm, and togetherness that has been given. Thank you for both looking for directions, even though sometimes we are both confused about where to go. In the end, we can still strengthen each other and get to this point. Many stories, laughter, and memories that the author will always remember.
11. To the writer's laughing friend, Fitriani, thank you for being a friend who always makes this lecture trip feel more exciting. Thank you for all the stories, laughter, sometimes endless jokes, and all the moments we managed to get through together. Thank you for always being there and strengthening each other until we can finally get to this point. Hopefully later we will still have many stories to remember together.
12. To the writer's best friends since the time of white and gray, (Dora, Nadya, and Gebby), thank you for being part of the writer's life journey until now. Thank

you for your support, attention, and togetherness that has been maintained even though time and busyness continues. Your presence provides many colors, laughter, and beautiful memories that are always an encouragement for writers. Thank you for growing with the author over the years. All the stories, laughter, and memories we have gone through will always be a beautiful part that will never be forgotten.

13. To the author's childhood friend and best friend, Ednan and Elna, Thank you for being a part of the journey since childhood until now. Thank you for the togetherness, simple stories, laughter, and memories that have grown together over time. Although time and circumstances take us on different paths, every moment that has been passed together will always be a precious part that will never be forgotten.
14. To the writer's lecture friends, (Ivo, Tari, Miftah, Safitri, Raisah, Nadea, and Zahirah), thank you for the togetherness, support, and enthusiasm that has been given during the lecture period. Your presence has been a part of the many stories, learnings, and memories that color this journey. Thank you for sharing your laughter, experiences, and struggles during your education together. Every moment that has been passed will always be a precious memory stored in the life journey of the writer.
15. To the writer's mentorship, Irfan, Tasya, and Ichsan, thank you for the togetherness, help, and enthusiasm that has been given during this thesis guidance process. We have gone through many things together, ranging from discussing, exchanging opinions, to strengthening each other in the midst of a process that is not always easy. Your presence is an important part of this journey and provides meaningful support until the author can complete this thesis.
16. Finally, the author would like to express his deep gratitude to himself, Mela Apriana Dewi. Thank you for persevering in the midst of tiredness, doubt, and circumstances that are not always easy. Those who keep going even though they often want to stop, those who choose to get up even though they have fallen, and those who continue to fight even though they are not always strong.

This work is a testament to the determination of the heart, of every effort that is not seen, of the tears that are not always told, and of the courage not to give up until it is finished. Thank you for staying strong up to this point. *I'm proud of you, Mela Apriana Dewi.*



**THE RELATIONSHIP BETWEEN EXPOSURE TO CIGARETTE SMOKE
IN THE HOUSEHOLD AND SOCIAL ENVIRONMENT WITH THE
INCIDENCE OF ANEMIA IN PREGNANT WOMEN AT BERINGIN
HEALTH CENTER BENGKULU CITY RAYA IN 2026**

Mela Apriana Dewi¹, Nur Elly², Kheli Fitria A³

¹Applied Nursing Undergraduate Study Program, Polytechnic of the Ministry of Health Bengkulu

^{2,3} Lecturer of the Department of Nursing of the Ministry of Health of Bengkulu
Email: nurelly@poltekkesbengkulu.ac.id

ABSTRACT

Background: Anemia in pregnant women is still a health problem that can increase the risk of complications for both mother and fetus. Exposure to secondhand smoke is thought to be associated with the incidence of anemia because the carbon monoxide content and toxic substances in cigarette smoke can affect hemoglobin levels during pregnancy. **Objective:** To determine the relationship between exposure to cigarette smoke in the environment and the incidence of anemia in pregnant women at the Beringin Raya Health Center, Bengkulu City. **Methods:** This study is an observational quantitative research with a *case control* design. The sample consisted of 60 respondents consisting of 30 pregnant women with anemia as the case group and 30 pregnant women with no anemia as the control group. The sampling technique in the case group used *total sampling*, while the control group used *simple random sampling*. Data analysis used the *Chi-Square* test, *Fisher's Exact Test*, and *Odds Ratio* (OR) with a 95% confidence level. **Results:** There was a significant relationship between exposure to cigarette smoke in the household environment and the incidence of anemia in pregnant women ($p=0.000$). Pregnant women who were exposed to secondhand smoke in the household environment had a 13-fold greater risk of developing anemia than those who were not exposed ($OR=13,000$; 95% $CI=3,551-47,597$). In addition, there was a significant relationship between exposure to cigarette smoke in the social environment and the incidence of anemia ($p=0.026$). Pregnant women who were exposed to cigarette smoke in a social environment had a 10.5-fold greater risk of developing anemia than those who were not exposed ($OR=10.545$; 95% $CI=1.227-90.662$). **Conclusion:** Exposure to cigarette smoke in the household and social environment is significantly related to the incidence of anemia in pregnant women and increases the risk of anemia during pregnancy.

Keywords: *Anemia, case control, pregnant women, exposure to cigarette smoke, household environment, social environment..*

HUBUNGAN PAPARAN ASAP ROKOK DI LINGKUNGAN TERHADAP KEJADIAN ANEMIA PADA IBU HAMIL DI PUSKESMAS BERINGIN RAYA KOTA BENGKULU TAHUN 2026

Mela Apriana Dewi¹, Nur Elly², Kheli Fitria A³

¹ *Introductory Undergraduate Student of the Bengkulu Health Nursing Polytechnic,*

^{2,3} *Lecturer at the Department of Health Nursing, Bengkulu Polytechnic,*
Email: nurelly@poltekkesbengkulu.ac.id

ABSTRACT

Latar belakang: Anemia pada wanita hamil tetap menjadi masalah kesehatan masyarakat utama yang dapat meningkatkan risiko hasil buruk bagi ibu dan janin. Paparan asap rokok pasien diduga terkait dengan anemia karena karbon monoksida dan zat beracun lain yang terkandung dalam asap rokok dapat memengaruhi kadar hemoglobin selama kehamilan. **Tujuan:** Studi ini bertujuan untuk menentukan hubungan antara paparan asap rokok di lingkungan rumah tangga dan sosial dengan anemia pada wanita hamil di Pusat Kesehatan Komunitas Beringin Raya, Kota Bengkulu. **Metode:** Studi ini menggunakan desain observasional analitis dengan pendekatan kasus-kontrol. Sampel terdiri dari 60 responden, termasuk 30 wanita hamil dengan anemia sebagai kelompok kasus dan 30 wanita hamil tanpa anemia sebagai kelompok kontrol. Pengambilan sampel total digunakan untuk kelompok kasus, sementara pengambilan sampel acak sederhana diterapkan pada kelompok kontrol. Data dianalisis menggunakan uji Chi-kuadrat, Fisher's Precise Test, dan Chance Ratio (OR) dengan interval kepercayaan 95%. **Hasil:** Terdapat hubungan signifikan antara paparan asap rokok pasien di rumah tangga dan anemia pada wanita hamil ($p=0.000$). Wanita hamil yang terpapar asap rokok pasif di lingkungan rumah tangga memiliki peluang anemia 13 kali lebih besar dibandingkan mereka yang tidak terpapar ($OR=13.000$; $CI\ 95\%=3,551-47,597$). Selain itu, ditemukan hubungan signifikan antara paparan asap rokok di lingkungan sosial dan anemia ($p=0,026$). Wanita hamil yang terpapar asap rokok sekunder dalam lingkungan sosial memiliki peluang anemia 10,5 kali lebih besar dibandingkan mereka yang tidak terpapar ($OR=10.545$; $CI\ 95\%=1.227-90.662$). **Kesimpulan:** Paparan asap rokok tidak langsung baik di rumah tangga maupun lingkungan sosial secara signifikan berhubungan dengan anemia pada wanita hamil. Paparan asap rokok pasif meningkatkan kemungkinan anemia selama kehamilan.

Kata kunci: anemia, Ibu hamil, lingkungan rumah tangga, lingkungan sosial, kontrol kasus, paparan asap rokok.

FOREWORD

Praise be to Allah SWT who has given His grace and grace, so that the author can complete this thesis with the title "The Relationship of Exposure to Cigarette Smoke in the Environment to the Incidence of Anemia in Pregnant Women " In completing this thesis, the author received a lot of material and moral assistance from various parties, for which the author would like to thank the:

1. Mrs. Linda, SST., M.Kes, as the Director of the Health Polytechnic of the Ministry of Health Bengkulu
2. Mrs. Ns.Erni Buston, SST., M.Kes as the Head of the Nursing Department of the Bengkulu Ministry of Health.
3. Mrs. Dr. Nur Elly, S.Kp., M.Kes, as Supervisor I who provided a lot of support, input, direction, suggestions, time, and motivation to continue to be enthusiastic about working on this Thesis until it can be completed.
4. Mrs . Ns. Khelly Fitria Anuril, M.Kep., Sp. Kep. Mat, as Supervisor II who provided a lot of support, input, direction, suggestions, time, and motivation to continue to be enthusiastic about working on this Thesis until it can be completed.
5. Mrs. Ns. Mardiani, S.Kep., MM as the Chair of the Board of Examiners who is willing to provide input in the completion of the Thesis.
6. Mrs. Ns. Husni, S.Kep., M.Pd as Examiner I who was willing to take her time to guide and provide input in completing the Thesis.
7. As well as all lecturers and staff of the Department of Nursing of the Ministry of Health of the Ministry of Health of Bengkulu. I realize that this thesis still has shortcomings and hopefully it will be useful for all parties.

Bengkulu, 08 July 2026

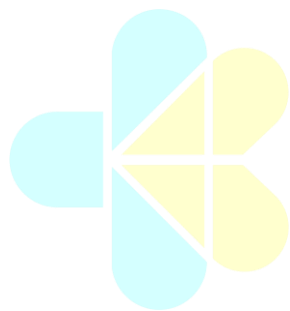
Mela Apriana Dewi

TABLE OF CONTENTS

THESIS TITLE PAGE	i
THESIS APPROVAL PAGE	ii
THESIS CONFIRMATION PAGE	iii
BIODATA.....	iv
STATEMENT OF ORIGINALITY	v
PRESENTATION.....	vi
ABSTRACT	xi
ABSTRACT	xii
FOREWORD.....	xiii
TABLE OF CONTENTS	xiv
TABLE LIST	xxi
LIST.....	xxii
LIST OF ATTACHMENTS.....	xxiii
ABBREVIATION LIST.....	xxiv
CHAPTER I INTRODUCTION.....	1
A.Background	1
B.Problem Formulation	4
C.Research Objectives.....	5
D.Research Benefits.....	5
CHAPTER II THEORETICAL OVERVIEW	7
A.The Concept of Anemia in Pregnancy	7
1.Definition	7
2.Etiology of Anemia in Pregnancy	7
3.Classification of Anemia in Pregnancy	10
4.Pathophysiology of Anemia in Pregnancy	11
5.Clinical Manifestations	12
6.Risk factors	13
7.Complications	15
8.Governance	15
B.Exposure to Cigarette Smoke in the Household.....	16
1.Definition of Cigarette Smoke Exposure	16

2.Toxic Content in Cigarette Smoke	17
3.Mechanism of Impact of Cigarette Smoke on Blood.....	18
C.Exposure to Cigarette Smoke in the Social Environment	19
D. . The Relationship between Cigarette Smoke Exposure and the Incidence of Anemia in Pregnant Women	20
E.Theoretical Framework	22
CHAPTER III CONCEPTUAL FRAMEWORK, RESEARCH VARIABLES, AND OPERATIONAL DEFINITIONS.....	23
A.Research Concept Framework	23
B.Operational Definition	24
C.Hypothesis	25
CHAPTER IV RESEARCH METHODS	26
A.Research Type and Design	26
B.Research Variables.....	26
C.Research Location and Time.....	27
D.Poplasy and Research Samples.....	27
E.Data Collection.....	28
F.Data Processing.....	30
G.Data Analysis.....	32
H.Research Flow	33
I.Research Ethics	34
CHAPTER V RESULTS AND INTERPRETATION	36
A.The Course of Research	36
B.Research Results	38
1.Overview of Respondent Characteristics	39
2. Overview of Distribution of Cigarette Smoke Exposure Frequency	40
3.The Relationship between Exposure to Cigarette Smoke in the Household Environment and Social Environment in Pregnant Women ...	40
CHAPTER VI DISCUSSION	44
A.Interpretation and Discussion of Results	44
1.Overview of the Frequency Distribution of Respondent	

Characteristics by Age, Parity, Occupation, and Education Level	44
2. Overview of Distribution of Cigarette Smoke Exposure Frequency	49
3. The Relationship between Exposure to Cigarette Smoke in the Household Environment and the Incidence of Anemia in Pregnant Women	50
4. The Relationship between Cigarette Smoke Exposure in the Social Environment and the Incidence of Anemia in Pregnant Women	52
B. Research Limitations	53
CHAPTER VI CONCLUSION	55
A. Conclusion	55
B. Suggestions	56
BIBLIOGRAPHY	57



Kemenkes
Poltekkes Bengkulu

TABLE LIST

Table 1	24
Table 2	39
Table 3	40
Table 4	41
Table 5	42



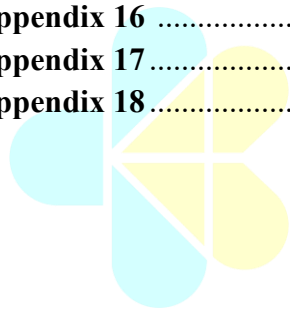
LIST

Chart 1 Theoretical Framework.....	22
Chart 2 Concept Framework.....	23
Chart 3 Research Design	26



LIST OF ATTACHMENTS

Appendix 1	64
Appendix 2	73
Appendix 3	75
Appendix 4	76
Appendix 5	77
Appendix 6	78
Appendix 7	80
Appendix 8	82
Appendix 9	82
Appendix 10	83
Appendix 11	84
Appendix 12	85
Appendix 13	87
Appendix 14	87
Appendix 15	89
Appendix 16	89
Appendix 17	90
Appendix 18	91



Kemenkes
Poltekkes Bengkulu

ABBREVIATION LIST

HB	: Hemoglobin
WHO	: <i>World Health Organization</i>
SKI	: Indonesian Health Survey
CO	: Carbon monoxide
COHB	: Carboxyhemoglobin
GATS	: <i>Global Adult Tobacco Survey</i>
ANC	: <i>Antenatal Care</i>
TTD	: Blood Supplement Tablets
BBLR	: Low Birth Weight
FIGO	: International Federation of Gynaecology and Obstetrics
TO	: Maternal and Child Health Book
AREA	: <i>δaminolevulinic acid dehydrase</i>
MDA	: <i>Malondialdehyde</i>

