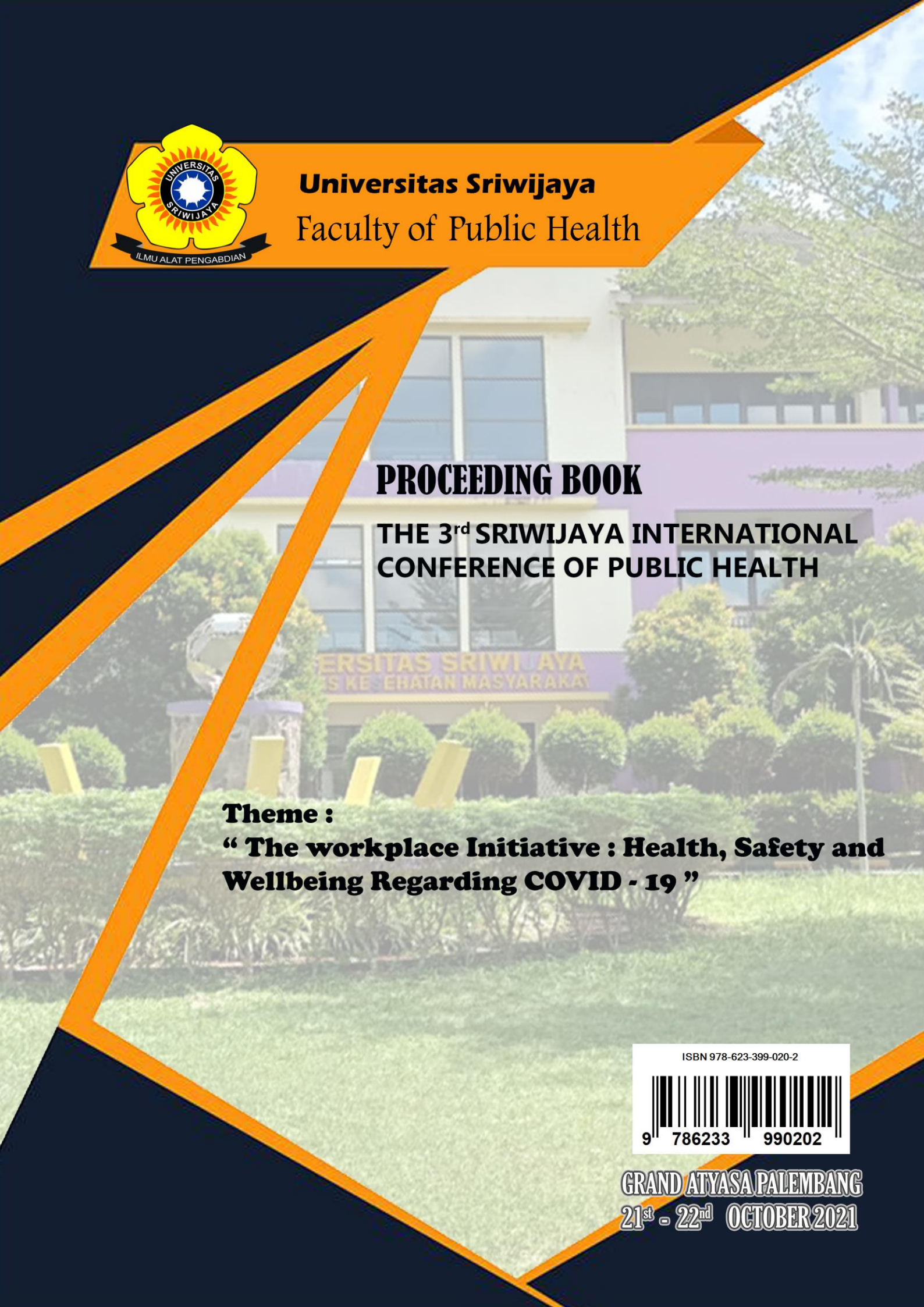

Universitas Sriwijaya

Faculty of Public Health

PROCEEDING BOOK

THE 3rd SRIWIJAYA INTERNATIONAL CONFERENCE OF PUBLIC HEALTH

Theme :

" The workplace Initiative : Health, Safety and Wellbeing Regarding COVID - 19 "

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GRAND ATYASA PALEMBANG

21st - 22nd OCTOBER 2021

PROCEEDING
THE 3rd SRIWIJAYA INTERNATIONAL CONFERENCE ON PUBLIC HEALTH

The Work Place Initiative: Health, Safety and Wellbeing Regarding COVID-19

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PROCEEDING
THE 3rd SRIWIJAYA INTERNATIONAL CONFERENCE ON PUBLIC HEALTH

The Work Place Initiative: Health, Safety and Wellbeing Regarding COVID-19

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PREFACE

On behalf of the organizing committee, I am delighted to welcome you to the 3nd Sriwijaya International Conference on public Health (SICPH 2021) during 21th october 2021 at Palembang South Sumatera, Indonesia. The SICPH 2021 is international conference organized by Faculty of Public Health, Sriwijaya University (UNSRI). I would like to extend my warmest welcome to all the participant of The SICPH 2021 under the theme ***"The Impact of Climate Change on Infectious Disease Transmission".***

The SICPH 2021 consists of keynote sessions from well known expert speakers in the field of public health, and academic paper sessions (oral presentations) who are coming from several region. This conference seeks to bring together academics, public health professionals, researchers, scientists, students and health stakeholders from a wide range of disciplines to present their latest research experience and further development in all areas of public health. We hoped that this conference will be usefull platform for researchers to present their finding in the areas on multidisciplinary realted to public health and health system issues.

This conference will provide opportunities to exchange ideas, knowledge, and development of the latest research among the participants. We will publish the paper as output from the SICPH 2021 in proceeding book with ISBN and selected paper will be published in Jurnal ilmu kesehatan masyarakat- SINTA 3 (a nationally-accredited journal). The SICPH 2021 is being attended by about 50 participants. I hope you enjoy the conference.

With regard to considerable conference agenda, we greatly appreciate any support and sponshorship derived from any govermental as well as private institutions for the success of the conference. Great appreciation is also handed to organizing committe of the conference for any voluntarily effort that bring to the succes of the conference.

The conference committee expresses its gratitude towards all the keynote speakers, authors, reviewers, and participanst for the great contribution to enssure the succes of this event. Finnally, I sincerely thank all the members of the organizing committee who have worked hard to prepare this conference.

Palembang, October 2021

Chair,

Anita Camelia, SKM., MKKK.

PREFACE

First of all, let us thank God, the Almighty, who has given His grace and guidance so that the 3rd Sriwijaya International Conference of Public Health (SICPH) with the theme of The Workplace Initiative: Health, Safety and Wellbeing Regarding Covid:19 can be held successfully. I welcome all of you to this seminar which has received great attention not only from university, but also other communities to submit papers to be presented in this seminar. I express my highest gratitude and appreciation the presenters.

The conference is divided in two session, the first session is speeches and the second session is round table discussion. In the first session, the invited keynote speakers were Prof. Dr. Tan Malaka, MOH, DrPH, SpOk, HIU (A Professor from Medical Faculty Universitas Sriwijaya), Prof. Dr. Retneswari Masilamani (University Tunku Abdul Rahman, Malaysia), Prof.Dr.Joselito L. Gapaz MD, M.PH(University of the Philippines) and Prof. Dr Tjandra Yoga Aditama, MHA,DTM&H, DTCE,SpP(C).FIRS (Professor from Griffith University, Australia)

Of course, this conference activity would not have succeeded without the support of all parties involved, as well as the presence of all participants in all regions in Indonesia and internationally. I especially thank to all the organizing committees for their hard work, perseverance, and patience in preparing and organizing this conference so that it can go well, smoothly and successfully.

Finally, through this conference let us extend the network and cooperation among all stakeholders of the public health sector, especially in Indonesia and in the world in general, to build a better public health world in Indonesia

Thank you for participating in this conference.

Dean of Public Health Faculty,

Universitas Sriwijaya

Dr. Misnaniarti, S.K.M, M.K.M

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THE CORRELATION OF ENVIRONMENTAL TOBACCO EXPOSURE DURING PREGNANCY (PASSIVE SMOKER) WITH THE HAPPENED OF LOW BIRTH WEIGHT (LBW) AT PRABUMULIH PUBLIC HOSPITALS

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ABSTRACT

Numerous studies have concluded an association exists between environmental tobacco smoke and low birth weight (LBW). The purpose of study is to know the correlation of environmental tobacco smoke exposure during pregnancy and low birth weight. This case-controlled study aimed to analyze the association by using 45 cases (mother of LBW infants) and 45 controls (mother of normal birth weight infants with matching of the age mother and residence based in case group). The data was analyzed by performing chi-square and multiple logistic regression within a risk factor model. Exposure to environmental tobacco smoke during pregnancy was associated with the occurrence of LBW (p-value: 0.040, OR 2.9 (95% CI 1.142 to 7.482)). No variables were found to have interaction effects with environmental tobacco smoke exposure during pregnancy and LBW. Exposure to environmental tobacco smoke during pregnancy had the most significant impact on LBW occurrences after controlling family income and the age fetus in the womb (p-value 0.004, OR 12.3 (95% CI 2.265 to 66.955)). Environmental tobacco smoke has associated with the occurrence of LBW. The recommendation that can be given is prevent environmental tobacco smoke exposure to pregnant women and carry out routine antenatal care to prevent pregnancy complications.

Keywords: *Environmental Tobacco Smoke**,** Low birth weight, Pregnancy*

ABSTRAK

Sejumlah penelitian telah menyimpulkan ada hubungan antara asap rokok di lingkungan dan berat badan lahir rendah (BBLR). Tujuan penelitian untuk mengetahui hubungan paparan asap rokok lingkungan selama kehamilan dengan berat badan lahir rendah. Studi kasus kontrol ini bertujuan untuk menganalisis hubungan dengan menggunakan 45 kasus (ibu bayi BBLR) dan 45 kontrol (ibu dari bayi berat lahir normal dengan pencocokan usia ibu dan tempat tinggal berdasarkan kelompok kasus). Data dianalisis dengan melakukan chi-square dan regresi logistik berganda dalam model faktor risiko. Paparan asap rokok lingkungan selama kehamilan dikaitkan dengan terjadinya BBLR (p-value: 0,040, OR 2,9 (95% CI 1,142 hingga 7,482)). Tidak ada variabel yang ditemukan memiliki efek interaksi dengan paparan asap tembakau lingkungan selama kehamilan dan BBLR. Paparan asap rokok lingkungan selama kehamilan memiliki dampak paling signifikan terhadap kejadian BBLR setelah dikontrol variable pendapatan keluarga dan usia janin dalam kandungan (p-value 0,004, OR 12,3 (95% CI 2,265 hingga 66,955)). Asap rokok di lingkungan berhubungan dengan terjadinya BBLR. Rekomendasi yang dapat diberikan adalah mencegah paparan asap rokok lingkungan pada ibu hamil dan melakukan pemeriksaan kehamilan secara rutin untuk mencegah komplikasi kehamilan.

Introduction

Cigarettes is one of the sources of air pollution producing 10-15 billion cigarette butts to environment every day and costing households and governments more than US$1.4 trillion due to health care spending and lost productivity.[1] Cigarettes harmful ingredients contained include nicotine, *Total Aerosol Residue* (TAR) and carbon monoxide. The organic chemical compounds alkaloids in nicotine are agonists and affect stimulant and relaxant.[2] Solid vapor from the TAR is the cause of discoloration smoker's body which is mutagenic and carcinogenic. Gas compounds in carbon monoxide in cigarette smoke can bind to the blood to form carboxyhemoglobin (COHb) and cause a decrease in the blood's capacity to bind oxygen.[3] The Framework Convention for Tobacco Control aims to protect against secondhand smoke exposure because there is no safe level exposure to passive smokers. Exposure to cigarette smoke during pregnancy can affect of the fetus growth which it can increase the risk of babies being born with low weight.[4] Global prevalence shows 15% of babies born with low birth weight and 30% of the total cases in developing countries. According Riset Kesehatan Dasar (Riskesdas), the prevalence of babies born with low body weight (LBW) in Indonesia is 6.2% and the report from Dinas Kesehatan (Dinkes) of South Sumatera Province reached 10.2%. The results of the study, happen increased cases of babies born with low weight every year at the Prabumulih City Hospital.[5]

Low weight infants are a threat to the next generation to be able to grow healthy and productive in nation building because they can increase the risk of mortality, morbidity and neonatal disability and have long-term impacts on children in the future.[6] A number of studies have found evidence to support the hypothesis that exposure to cigarette smoke in pregnant women can increase the risk of impaired fetal growth.[7,8,9,10] This research is reconfirmation study from previous studies with the same topic but with the development of research variables based on maternal, fetal and environmental factors.[11] This research is a research as a form of protection based on academic evidence about the impact of environmental tobacco smoke exposure as air pollution and is expected to letter be able to provide recommendation for related parties to carry out environmental health management as a form of preventive measures against event or environments based health disorders. This study aims to analyze the correlation environmental tobacco smoke exposure during pregnancy with cases of LBW.

Method

This research is a quantitative research using a case control design. Public hospital was chosen because it is the first health referral center in Prabumulih. The sample is all live births recorded at the Department of Obstetrics and Gynecology in the Neonates Room of a Public Hospital from January 1 to December 31, 2019 with the mother as the respondent. Sample was count using Lemeshow two-proportion hypothesis test with a total sample is 91 respondents. Subjects were two groups, namely the case group (mother of LBW infants) and control group (mother of normal weight infants), where the control group have matching comparison of the age mother during pregnancy and residence based in the case group. The sample using a simple random sampling technique according criteria like not twin baby and life birth, having telephone that can be connected and being willing to be respondents. Then, it compared the history of smoke exposure during pregnancy in the two groups. Dependent variable is life births (LBW and not LBW) and independent variable was smoke exposure. Maternal age, family income, mother's occupation, maternal education, parity, pregnancy complications and fetal age in the womb is covariate variables. Data processed with tabulation and descriptive form. In this study, data has been analyzed by univariate, bivariate and multivariate.

Univariate analysis aims to describe the frequency distribution of variable. Bivariate analysis using Chi-Square test which aims to know relation between the independent and dependent variables in this study with confidence interval 95% ($\alpha = 0.05$), power test 80% ($\beta = 0.84$). To know relation smoke exposure and LBW, it can be seen odds ratio. Multivariate analysis using multiple logistic regression test risk factor model which aims to see independent risk factor (smoke exposure) against the dependent (LBW) after being controlled by other variables (confounders).

Results

Sample in this study was 90 respondents with 45 respondents in case group and 45 respondents in control group. Interviews by telephone have many limitations such as not all respondent has personal telephone numbers, many telephone can't contacted, short interview duration and connection disruptions. There was one person who became a *study entrant* because she did not finish interview so that the data couldn't be analyzed after followed up for some time, so she was excluded in this study. After get primary data from observed than *coding* and *entry* using Statistical Package for the Social Sciences (SPSS) program and then analyzed according to the research objectives. The prevalence of LBW cases by data recorded in neonates room of Public Hospital in 2019 was 49.43%. This prevalence cannot be

generalized to represent LBW cases in Prabumulih. Distribution frequency and determinants of study is by approach person, place and time approach.

Table 1. Distribution Statistic of Birth Weight

Statistic Variable	Value (gram)
Mean	2357.61
Median	2450
Minimum	300
Maximum	4100

Table 1 showed that the average baby weight was 2357.61 grams with a median of 2450 grams. The lowest baby weight was found to be 300 grams and the highest baby weight was 4100 grams.

Table 2. Distribution Frequency of Birth Weight

Variable	n	%
LBW	45	50.0
Normal	45	50.0

Birth weight infants categorized namely LBW and Normal. LBW category if the mother gave birth weight infants <2,500 grams and normal if the mother gave birth weight infants ≥2.500 gram.
Based on Table 3, the results show that pregnant women who are smoke exposed from family members are about 62 people (68.9%), pregnant women who are smoke exposed from colleagues are 12 people (13.3%), pregnant women who are smoke exposed from neighbors were 1 people (1.1%), pregnant women who are smoke exposed from public places were 90 people (100%) and pregnant women who are smoke exposed from public transportation were 5 people (5.5%) of the total research respondents in this study.

Table 3. Distribution Statistic of Smoke Exposure

Variable	Exposed		No Exposed	
	n	%	n	%
Family members	62	68.9	28	31.1
Neighbors	1	1.1	89	98.9
Colleagues	12	13.3	78	86.7
Public Places Public	90	100	0	0
Transport	5	5.5	85	94.4

Smoke exposure categorized namely high exposure and low exposure. High exposure category if pregnant women are exposed to 2 of the 5 characteristics, while the low category is if pregnant women are exposed to 1 of the 5 characteristics.

Table 4.Distribution Frequency of Smoke Exposure

Variable	n	%
High Exposure	62	68.9
Low Exposure	28	31.1

The Relationship between Smoke Exposure and LBW

The results of statistical tests showed a relationship between smoke exposure and LBW (p-value 0.040; OR = 2.923).

Table 6. Cross Tabulation Smoke Exposure and LBW

Exposure Status	LBW	Normal	Total	OR (95% CI)	p-value
High Exposure	36 (58.1%)	26 (41.9%)	62 (100%)	2.9 (1.142-7.482)	0.040
Low Exposure	9 (32.1%)	19 (67.9%)	28 (100%)		

The Relationship between Mother's Age and LBW

The results of statistical tests showed a not relationship between mother's age and LBW (p-*value* 1.000; OR = 1.000). This is in accordance with previous research which also showed a not relationship between mother's age and LBW.[12]

Table 7. Cross Tabulation Mother's Age and LBW

Exposure Status	LBW	Normal	Total	OR (95% CI)	p-value
Risk	20 (50.0%)	20 (50.0%)	40 (100%)	1.0 (0.435-2.297)	1.000
No Risk	25 (50.0%)	25 (50.0%)	50 (100%)		

The Relationship between Family Income and LBW

The results of statistical tests showed a not relationship between family income and LBW (p-*value* 0.662; OR = 1.333). This is in accordance with previous research which also showed a not relationship between family income and LBW.[13]

Table 8. Cross Tabulation Family Income and LBW

Exposure Status	LBW	Normal	Total	OR (95% CI)	p-value
Low	30 (52.6%)	27 (47.4%)	57 (100%)	1.3 (0.564-3.151)	0.662
High	15 (45.5%)	18 (54.5)	33 (100%)		

The Relationship between Mother's Job and LBW

The results of statistical tests showed a not relationship between mother's job and LBW (p-*value* 0.382; OR = 0.618). This is in accordance with previous research which also showed a not relationship between mother's job and LBW.[13]

Table 9. Cross Tabulation Mother's Job and LBW

Exposure Status	LBW	Normal	Total	OR (95% CI)	p-value
Work	14 (42.4%)	19 (57.6%)	33 (100%)	0.6 (0.260-1.468)	0.382
No Work	31 (54.4%)	26 (45.6%)	57 (100%)		

The Relationship between Mother's Education and LBW

The results of statistical tests showed a not relationship between mother's education and LBW (p-*value* 1.000; OR = 1.093). This is in accordance with previous research which also showed a not relationship between mother's education and LBW.[13]

Table 10. Cross Tabulation Mother's Education and LBW

Exposure Status	LBW	Normal	Total	OR (95% CI)	p-value
Rendah	24 (51.1%)	23 (48.9%)	47 (100%)	1.0 (0.478-2.501)	1.000
Tinggi	21 (48.8%)	22 (51.2%)	43 (100%)		

The Relationship between Parity and LBW

The results of statistical tests showed a not relationship between parity and LBW (p-*value* 1.000; OR = 1.000). This is in accordance with previous research which also showed a not relationship between parity and LBW.[14]

Tabel 11. Cross Tabulation Parity and LBW

Exposure Status	LBW	Normal	Total	OR (95% CI)	p-value
Risk	28 (50.0%)	28 (50.0%)	56 (100%)	1.0 (0.426-2.345)	1.000
No Risk	17 (50.0%)	17 (50.0%)	34 (100%)		

The Relationship between Pregnancy Complication and LBW

The results of statistical tests showed a relationship between pregnancy complications and LBW(p-*value* 0.006; OR = 3.692). This is in accordance with previous research which also showed a relationship between pregnancy complications and LBW.[15]

Tabel 12. Cross Tabulation Pregnancy Complication and LBW

Exposure Status	LBW	Normal	Total	OR (95% CI)	p-value
Berisiko	32 (64.0%)	18 (36.0%)	50 (100%)	3.6 (1.534-8.886)	0.006
Tidak Berisiko	13 (32.5%)	27 (67.5%)	40 (100%)		

The Relationship between Age Fetus in the Womb and LBW

The results of statistical tests showed a relationship between age fetus in the womb and LBW (p-*value* 0.000; OR = 20.091). This is in accordance with previous research which also showed a relationship between age fetus in the womb.[16]

Table 13. Cross Tabulation Age Fetus in the Womb and LBW

Exposure Status	LBW	Normal	Total	OR (95% CI)	p-value
Premature	34 (85.0%)	6 (15.0%)	40 (100%)	20.0 (6.715-60.108)	0.000
No Premature	11 (22.0%)	39 (78.0%)	50 (100%)		

Dominant Variables Affect LBW

Multivariate modeling begins with performing multiple logistic regression analysis on all independent variables that have been included in the preliminary modeling of multivariate analysis. Complete model is including the main independent variables and confounding candidates without bivariate selection. Bivariate selection was not carried out because it could lead to errors in assessing interactions. Independent variables that do not pass the bivariate selection (p-value > 0.25) may interact with the main independent variable. If these variables are not included in the multivariate analysis

model, it will lose the potential for interaction tests. Interaction test was conducted between the main research variables like tobacco smoke exposure and other independent variables. After interaction test, there is no independent variables that interact with each other because all p-values are >0.05 so that the preliminary model can be obtained directly in the multivariate analysis.

Tabel 14. Preliminary Modeling Multivariate

Variable	p-value	OR_{crude}	95% *Confidence Intrval*	
			Lower	Upper
Tobacco Smoke Exposure	0.005	11.803	2.078	67.059
Mother's Age	0.956	0.967	0.290	3.221
Family Income	0.158	2.803	0.670	11.719
Mother's Job	0.406	0.589	0.169	2.052
Mother's Education	0.662	0.741	0.193	2.839
Parity	0.783	1.199	0.329	4.373
Preganancy Complication	0.401	1.655	0.510	5.368
Age Fetus in the Womb	0.000	45.814	8.877	236.451

The variable elimination phase is carried out in stages, starting from the variable that has the largest p-value to the smallest by taking into account the changes in the ORcrude value of environmental cigarette smoke exposure. If when one variable is removed from the model and there is no change in the ORcrude value of environmental cigarette smoke exposure <10%, then the variable is excluded. However, if there is a change in the ORcrude value of environmental cigarette smoke exposure that is >10%, then the variable is re-entered into the model and is considered as confounding. Based on the results of the confounder test, it is known that the variables of maternal age, mother's occupation, mother's education and pregnancy complications do not act as confounders in this study due to changes in the odds ratio value which is <10%. The test results show that the variables of family income and fetal age are confounders in this study.

Table 15. Final Model Multivariate

Variable	p-value	OR	95% *Confidence Interval*	
			Lower	Upper
Tobacco Smoke Exposure	0.004	12.314	2.265	66.955
Family Income	0.154	2.517	0.707	8.955
Age Fetus in the Womb	0.000	50.211	10.131	248.859

The results of multivariate analysis showed that there was a significant relationship between tobacco smoke exposure and LBW (p-value = 0.004) after controlling by family income and fetal age in

the womb. Odds ratio value shows that pregnant women who are high exposed to environmental tobacco smoke can increase the risk of 12.3 higher to cases of low birth weight compared to pregnant women who are low exposed to environmental tobacco smoke.

Discussion

The Relationship between Smoke Exposure and LBW

Nicotine in cigarette smoke can damage the nervous system and vasoconstriction until causing hypertension.[17] Tar in cigarette smoke is one of the causes oxidative stress and hypertension in pregnant women.[18] Hypertension in pregnant women can cause a decrease in appetite which can make lack nutritional intake for fetal growth.[19] Tar in cigarette smoke can cause lung hypo perfusion which reduces pulmonary blood flow so that it can cause a decrease in oxygen to the fetus.[20]. Tar in cigarette smoke can also cause folat deficiency so that it has the potential to cause anemia in pregnant women so that the oxygen supply for the fetus is reduced.[17] In addition, carbon monoxide in pregnant can form carboxyhemoglobin (COHb) which can cause a decrease in the oxygen-carrying capacity in the blood of pregnant women. In pregnant women, restriction of oxygen can cause hypoxia in the fetus.[17] Prevention of the birth of babies with low weight with avoid tobacco smoke exposure inside or outside the home, doing antenatal care regularly and implementing Clean and Healthy Lifestyle (PHBS) in daily life.

The Relationship between Mother's Age and LBW

Pregnant age is at risk if the age is less than 20 years and more than 35 years. The statement of previous researchers stated that pregnant women with the age of less than 20 years were associated with mental readiness in facing pregnancy and increased the incidence of pregnancy complications that could cause the distribution of nutrients to the fetus to be disrupted.[21] Pregnant women aged over 35 years have decreased reproductive organ function which will increase the risk of weak uterine contractions.[22] However, in this study, the statistical results are inversely proportional to the existing statements, it can be influenced by the habits of the mother during pregnancy, good antenatal care, knowledge of the mother and the mindset of the mother during pregnancy.

The Relationship between Family Income and LBW

Family income will affect consumption patterns and family food purchasing power.[20] The statement of previous researchers stated that pregnant women who lack nutrition during pregnancy can

increase the incidence of anemia and affect access to antenatal care during pregnancy.[23] In this study, the statistical results do not match statements because consumption patterns are influenced by culture and people's lifestyles.[24] People with characteristics of industrial areas will be more likely to pay less attention to the concept of eating such as frequently consuming fast food and junk food.[25] Families with low incomes it can be prevented by improving the intake of nutritious and affordable staple foods such as vegetables and fruit so that pregnant women do not lack nutrition during pregnancy. Antenatal services for families with low incomes can be accessed free of charge through government programs such as Jampersal and KIS so that there is no reason for families with low family incomes not to have their pregnancy checked and get information about pregnancy through health workers.

The Relationship between Mother's Job and LBW

The hormone progesterone changes during pregnancy which causes the mother to become weak and sleepy. Mothers who work during pregnancy will cause the muscles to contract continuously, causing muscle fatigue coupled with a lack of rest time and work stress which can have implications for the health of the fetus they contain. Physical and psychological fatigue in pregnant women can cause a decrease in appetite and trigger uterine contractions.[26] Pregnant women who work but do not LBW cases can be affected due to differences in physical activity of pregnant women, working time and workload, good nutritional consumption and better ability to access antenatal care due to additional family income so as to prevent pregnancy complications. Meanwhile, for pregnant women who do not work and experience cases of LBW, it can be caused by increased time for physical activities such as shopping and cleaning the house so that there is no time for pregnant women to rest.[27]

The Relationship between Mother's Education and LBW

Mothers with higher education will pay more attention to nutritional intake and routinely carry out antenatal care while mothers with low education tend to be more difficult to receive information and realize the importance of prenatal care.[28] Thoughts and attitudes during pregnancy are not only influenced by formal education but are also influenced by socio-economic, cultural and environmental factors.[29] One of the results of learning based on the social environment is to believe in the myths circulating in the community and then to be trusted and used as a basis for action. In this study, it was found that the prohibition of napping for pregnant women could affect the quantity of sleep of the mother. Adequate rest needs of pregnant women can have an impact on the immune system and blood

pressure. A pregnant woman is recommended to sleep 8 hours at night and 1 hour during the day. In addition, this study found wrong assumptions regarding the pattern of consumption of supplements during pregnancy with the argument that the supplements came from synthetic materials given by medical staff. Though these supplements function to support fetal growth and prevent complications.

The Relationship between Parity and LBW

The immature reproductive organs in the primiparous group and contractions in the grandemultiparous group with the many childbirth make the risk of pregnancy complications higher and fetal position abnormalities.[12] Mothers with a pregnancy less than 2 years will share three nutritional intakes for recovery of mother, baby and fetus. Low nutritional intake is can make low weight infants. This can be prevented by spacing pregnancies with contraception and antenatal care routine to detected pregnancy complications.

The Relationship between Pregnancy Complication and LBW

Pregnancy complications like anemia, premature rupture, pre-eclampsia, eclampsia, bleeding and stomachache. Anemia occurs if the Hb level is <11 g% during pregnancy. Premature rupture if amniotic rupture before 37 weeks gestation and stomachache in pregnant women can occurred by contractions form estrogen and progesterone increase. Pre-eclampsia have a symptoms such as headaches and hypertension which can reduced oxygen and food supply to fetus. Bleeding can occurred before childbirth (ante partum) and after childbirth (postpartum) and can result pregnant women death. Eclampsia have a symptoms edema, fever and seizures. Seizures during pregnancy will reduce supply oxygen fetus and fever can result anorexia which fetal growth retardation.[30] This can be prevented by antenatal care routine to detected pregnancy complications.

The Relationship between Age Fetus in the Womb and LBW

Many factors can be caused premature (<37 weeks) like uterine contractions from placenta previa, pregnancy complications and maternal disease history. This can be prevented by integration at the primary, secondary and tertiary health care levels. Primary prevention can be approach to risk factors for premature such as nutrition, smoking, consuming drugs and alcohol. Secondary prevention can be paying attention to clinical symptoms by stopping the pathological process such as symptoms of

headaches, nausea, fever and decreased appetite in pregnant women. Tertiary prevention can be preventing preterm birth after clinical symptoms appeared to long of the gestation period.[31]

Dominant Variables Affect LBW

One of the effects of nicotine can causes dependence. This dependence causes obsessive correlation with household expenses. When someone experiences a dependence of cigarettes (tobacco dependency), then someone will buy cigarettes as a necessity people with high or low incomes.[32] People with low incomes are more prioritize smoking than buying basic necessities. Cigarette consumption in families with low incomes can reduce the quality of health, productivity and cause various diseases. Prioritizing cigarette consumption than basic needs causes a lack of purchasing power for consumption. Pregnant women is requires more energy to fetal growth. Nutritional adequacy can be seen can be seen through maternal weight during pregnancy.[33] This is related to the nutritional status of the mother during pregnancy and high level tobacco smoke exposure because it is one of the factors causing LBW. Smoking habits can cause higher particulates in the room. The cigarette smoke particles are toxic and carcinogenic. Tobacco smoke exposure in the second trimester can cause disruption of the process the fetal organs. Tobacco smoke exposure can shorten the gestational age. Nicotine can cause a amniotic membranes thinning and breaking until childbirth prematurely and increase the risk of LBW. Concentration of nicotine in amniotic will cause a decrease in amino acid transport that causes fetal growth retardation.

Conclusion

There is a relationship between tobacco smoke exposure with LBW and the variable associated with the incidence of LBW is tobacco smoke exposure during pregnancy after being controlled by family income and the age fetus in the womb. The recommendation that can be given is prevent environmental tobacco smoke exposure to pregnant women and carry out routine antenatal care to prevent pregnancy complications. Health workers can provide education about the dangers of tobacco smoke exposure to pregnant women in antenatal care and counseling program related to LBW in women of childbearing age. The government can provide environmental health promotion media in public places to remind about the dangers of tobacco smoke exposure and for future research can measure the

dose response and frequency tobacco smoke exposure in the body of pregnant women using different research designs.

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Conflict of Interest

The authors declare that they have no conflict of interest.

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