

OVERVIEW OF REPRODUCTIVE HEALTH IN WOMEN IN AGRICULTURAL AREAS DUE TO EXPOSURE TO PESTICIDES

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ABSTRAK

Paparan pestisida pada masa kehamilan dapat mempengaruhi kejadian gangguan tumbuh kembang pada anak dan gangguan reproduksi pada ibu. Paparan pestisida pada masa kehamilan dapat meningkatkan kejadian Berat Badan Lahir Rendah (BBLR) dan ibu yang terpapar juga akan beresiko mengalami anemia pada saat hamil bahkan dapat menyebabkan keguguran hingga kematian pada ibu dan janin. Penelitian ini dilakukan untuk mengidentifikasi hubungan potensial antara paparan pestisida selama kehamilan dan dampak buruk pada ibu dan janin. Proses pencarian literatur yang dilakukan pada tinjauan pustaka ini menggunakan database yaitu Google Scholar, PubMed, dan Scienedirect dengan rentang tahun terbit 2016 hingga 2023. Beberapa kata kunci yang digunakan adalah "Paparan", "Pestisida", "Kehamilan", "Pertanian", dan "Kesehatan Reproduksi". Hasil yang ditemukan dalam penelitian ini menunjukkan adanya hubungan potensial antara paparan pestisida selama kehamilan dan dampak buruk terhadap kesehatan ibu dan janin termasuk kelahiran prematur, berat badan lahir rendah, dan kelainan bawaan, diabetes gestasional, preeklampsia, dan gangguan pertumbuhan janin. Selain itu, paparan pestisida juga dikaitkan dengan potensi dampak kesehatan jangka panjang bagi ibu dan anak, seperti peningkatan risiko obesitas dan gangguan perkembangan saraf. Setelah mengetahui dampak yang ditimbulkan oleh paparan pestisida terhadap ibu hamil, maka sebagai perawat dapat memberikan edukasi atau penyuluhan kepada masyarakat khususnya ibu hamil mengenai penggunaan Alat Pelindung Diri (APD) pada saat mengikuti penyemprotan pestisida. Untuk mengurangi paparan pestisida pada ibu hamil, perawat juga dapat mengajarkan cara mencuci buah dan sayur yang dibelinya dengan bersih agar residu pestisida tidak menempel.

Kata Kunci : kehamilan; kesehatan reproduksi; paparan; pertanian; pestisida.

ABSTRACT

Exposure to pesticides during pregnancy can affect the incidence of developmental disorders in children and reproductive disorders in mothers. Exposure to pesticides during pregnancy can increase the incidence of Low Birth Weight (LBW) and mothers who are exposed will also be at risk of experiencing anemia during pregnancy and can even cause miscarriage to death in the mother and fetus. This study was conducted to identify potential associations between pesticide exposure during pregnancy and adverse maternal and fetal outcomes. The literature search process carried out in this literature review uses databases such as Google Scholar, PubMed, and ScienceDirect with a publication year range of 2016 to 2023. Some of the keywords used are "Exposure", "Pesticide", "Pregnancy", "Agriculture", and "Reproductive Health". The evidence uncovered in this study suggests a potential link between pesticide exposure during pregnancy and adverse maternal and fetal health outcomes including preterm delivery, LBW, congenital malformations, gestational diabetes, preeclampsia, and impaired fetal growth. In addition, exposure to pesticides is also associated with potential long-term health consequences for mothers and their children, such as an increased risk of obesity and neurodevelopmental disorders. After knowing the impact caused by exposure to pesticides on pregnant women, then as a nurse can provide education or counseling to the public, especially pregnant women regarding the use of Personal Protective Equipment (PPE) when participating in spraying pesticides. To reduce exposure to pesticides in pregnant women, nurses can also teach them how to wash fruits and vegetables that they buy cleanly to avoid pesticide residues sticking to them.

Keywords : exposure; pesticide; pregnancy; agriculture; reproductive health.

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INTRODUCTION

Agronursing is a comprehensive client-focused service and service management in the agricultural sector (Afandi et al., 2023). Agronursing is client-centered (individuals, families, groups, and communities) nursing and service management that is comprehensive and holistic in the field of agriculture. Agronursing is very suitable in Indonesia as an agricultural country because most of the Indonesian population works in the agricultural sector (Kurniyawan et al., 2023).

Pesticides are toxic substances that have the potential to have a negative impact on the environment and biodiversity, causing resistance, resurgence, emergence of new pests, and health problems for humans and other living things (Peraturan Menteri Pertanian, 2019). Pesticides are widely used by farmers to control pests, weeds, insects, and other diseases or animals that damage agricultural products to obtain optimal agricultural products (Kurniyawan et al., 2023). In recent years the use of pesticides has increased because they are considered the most effective way to control plant-disturbing organisms at the agricultural level. The use of highly toxic pesticides is mostly used in developing countries, including Indonesia. Globally, WHO

estimates that poisoning caused by pesticides causes 300,000 deaths per year mostly from low to middle-income countries (Peraturan Menteri Pertanian, 2019).

Inappropriate use of pesticides by farmers is caused by the use of pesticides that are not following the recommended dosage, and the principle of using pesticides that are not appropriate, such as the use of Personal Protective Equipment (PPE). The use of incomplete Personal Protective Equipment (PPE) is very vulnerable to pesticides entering the body, pesticides can enter the body through unprotected body parts when spraying pesticides using long clothes, head coverings, boots, mouth guards, eye protection, and gloves hand. Pathways of pesticide exposure to farmers' bodies are through hands and nose or direct contact when applying pesticides and direct contact with pesticides which will disrupt levels of the cholinesterase enzyme in the liver (Rahmasari & Musfirah, 2020).

Health problems that arise due to the use of pesticides that are not appropriate can endanger the health of farmers and consumers, non-target microorganisms, and have an impact on the digestion of the environment, both soil and water, some farmers do not feel the effects of pesticides in their bodies (Yushananta *et al.*, 2020).



However, this can be even more dangerous when it happens continuously, which is where signs of health problems due to pesticide poisoning begin to appear. Exposure to pesticides that have high concentrations can cause various health problems, mild acute poisoning can cause dizziness, headache, and skin irritation, while severe acute poisoning can cause nausea, chills, difficulty breathing, and increased pulse which can even cause death (Yushananta *et al.*, 2020).

Pregnancy is the period starting from conception until the birth of the fetus, the normal length of pregnancy is 280 days (40 weeks / 9 months 7 days) calculated from the first trimester which starts from conception until 3 months, the 2nd trimester from the 4th month to 6 months, and the 3rd trimester from the 7th to the 9th month (Retnaningtyaset *al.*, 2022). Exposure to pesticides during pregnancy can affect the incidence of developmental disorders in children and reproductive disorders in mothers. Exposure to pesticides during pregnancy can increase the incidence of LBW and mothers who are exposed will also be at risk of experiencing anemia during pregnancy and can even cause miscarriage to death in the mother and fetus (Yushananta *et al.*, 2021). Pesticides that enter the body can inhibit the work of the cholinesterase enzyme,

resulting in the accumulation of acetylcholine which serves as a liaison for nerve impulses to muscle cells and discoordination of muscle work occurs characterized by tremors, seizures, and headaches. Intoxication for a long time can cause anorexia, anemia, and neuropathy. During pregnancy, anemia becomes a risk of bleeding during delivery, and intrauterine growth disorders so babies are born with Low Birth Weight (LBW), stunted, and low immunity to perinatal death (Shihana *et al.*, 2016).

Pesticide exposure incidents experienced by farmers can be through farmer activities such as the process of mixing pesticides, the process of spraying pesticides, the process of going to agricultural land, the process of washing the tools that have been sprayed to the process of washing clothes used by spraying and have been exposed to pesticides. All of these activities can cause various health problems ranging from skin to breathing. Based on this background, the researchers aimed to analyze various health problems that could arise as a result of exposure to pesticides during pregnancy.

METHODS

The literature search process carried out in this literature review uses



databases such as Google Scholar, PubMed, and ScienceDirect with a publication year range of 2016 to 2023. The literature search was carried out using several keywords in Indonesian and English. Some of the keywords used are "Exposure", "Pesticide", "Pregnancy", "Agriculture", and "Reproductive Health".

The article search begins by identifying the keywords that have been found and approximately 11,670 articles are obtained that match the keywords. The next stage is screening by selecting the title of the article and the year of publication according to the research criteria. At this stage, 2.846 articles fit the research criteria. Furthermore, articles were filtered according to the inclusion and exclusion research criteria. In this screening, 969 articles met the inclusion and exclusion research criteria. The next stage is to filter articles against abstracts to focus articles according to research criteria. From this stage, 20 articles fit the research criteria. The 20 articles were re-selected according to the language, research design, output, and other predetermined criteria. Finally, 10 articles were determined that matched the research criteria and could proceed to the analysis stage.

RESULTS

Pregnant women who are continuously exposed to pesticides can be at risk of developing anemia and hypertension during pregnancy. Research conducted by (Sulistyawati et al, 2019) showed that 73.2% of pregnant women who were exposed to pesticides experienced anemia. This proves that there is a relationship between a history of exposure to pesticides and the incidence of anemia in pregnant women. In addition, pregnant women who are exposed to pesticides can also be at risk of developing hypertension as evidenced by research conducted by Septiana, et al (2021) which shows there is a significant relationship between work related to pesticide exposure and the incidence of hypertension in pregnant women. The incidence of hypertension in pregnant women due to exposure to pesticides is due to the lack of awareness of exposure to pesticides and not using PPE. Apart from being at risk during the mother's pregnancy, continuous exposure to pesticides can also have an impact on the baby being born. There is a significant difference between exposure to pesticides and the incidence of LBW pregnant women who are exposed to pesticides are more likely or two times more likely to give birth to babies with low birth weight than pregnant women who are



not exposed to pesticides.(Rahmawati et al., 2023). The incidence of LBW is influenced by levels of umbilical serum IGF-1 due to exposure to pesticides during pregnancy (Widyawati et al., 2020). Research conducted by (Ehrenstein et al., 2019)demonstrated that the risk of offspring with autism spectrum disorders increased after prenatal exposure to ambient pesticides within 2000 m of their mother's residence during pregnancy. Pesticide exposure in pregnant women can

attack the fetus through the mechanism of metabolism from the mother's body to the fetus through the umbilical cord and placenta. The results showed that there were 28 (43.1%) children who experienced developmental delays due to exposure to pesticides (Zakiyah et al., 2017). Research results (Winnoto et al., 2016) showed that 64% of respondents experienced developmental disorders in pre-school children aged 4-5 years due to exposure to pesticides during pregnancy.

Tabel 1 Result of Literature Review

ID Number	Author and Journal Identity	Journal Titles	Objective	Population and Sample	method	Summary of Results
A1	Writer: Anggraeni, N. D., Kartini, A., Fatimah, S., & Pangestuti, D. R. Journal identity: Indonesian Public Health Media /2023/ Vol 22 (1): 12-19	Factors Affecting Hemoglobin Levels in Breastfeeding Mothers in Selokaton Village, Sukorejo District, Kendal Regency	To analyze the relationship between pesticide exposure, age, family income level, mother's education level, nutritional status, exposure to cigarettes, adequacy of vitamin C intake, and adequacy of iron intake with hemoglobin levels of breastfeeding mothers	Population: All breastfeeding mothers in Selokaton Village, Sukorejo District, Kendal Regency Sample: 42 breastfeeding mothers who met the inclusion and exclusion criteria.	Analytical observational research with a cross-sectional approach. Sampling was done by purposive sampling technique	There is no relevance between the variables of pesticide exposure, age, family income level, mother's education level, nutritional status, and hemoglobin levels of breastfeeding mothers in Selokaton Village. This is because breastfeeding mothers in Selokaton Village use PPE when spraying. The results also showed that exposure to cigarettes, the adequacy of iron and vitamin C intake tended to contribute to hemoglobin levels
A2	Writer: Widyawati, S. A., Suhartono, S.,	Relationship between pesticide exposure and	The study was conducted to analyze the relationship	Population: Mothers who gave birth in the period	This study used a case-control study, with infants born	The results of the study showed that there was a significant relationship between exposure to pesticides during



	<p>Mexitalia, M., & Soejoenoes, A.</p> <p>Journal Identity: International Journal of Occupational and Environmental Medicine/ 2020/ Vol. 11(1): 15-23</p>	<p>umbilical serum IGF-1 levels and low birth weight: a case-control study in Brebes, Indonesia</p>	<p>between exposure to pesticides during pregnancy and low birth weight (LBW) through disruption of the IGF-1 hormone</p>	<p>January-May 2018 at Brebes Hospital and Bhakti Asih Hospital Brebes, Central Java Province</p> <p>Samples: 36 LBW newborns (cases) and 36 normal babies (controls)</p>	<p>with LBW (weight <2500 g) and those born later with normal birth weight (>2500 g) at a hospital in Brebes as cases and controls.</p>	<p>pregnancy and low birth weight and low umbilical serum IGF-I levels. There is a significant relationship between low umbilical serum IGF-1 levels and low birth weight</p>
A3	<p>Writer: Zakiyah, N., Setiani, O., & Dewanti, N. A. Y.</p> <p>Journal Identity: PUBLIC HEALTH JOURNAL (E-Journal) Volume 5, Number 3, July 2017 (ISSN: 2356-3346)</p>	<p>Relationship between exposure to pesticides and developmental disorders in children aged 3-5 years in Girirejo village, Ngablak sub-district, Magelang district</p>	<p>The research was conducted to prove that exposure to pesticides in pregnant women affects the formation of the fetus in the womb and disrupts growth and development both physically, motorically, and personally socially</p>	<p>The population in this study were mothers who had children aged 3-5 years in the Girirejo village totaling 197</p>	<p>This study uses a case-control approach. The sampling technique used purposive sampling with the inclusion criteria being a farmer/farm laborer, having lived in Girirejo Village since before becoming pregnant until the research was carried out, willing to be a research respondent, and willing for their children to carry out developmental tests</p>	<p>The results showed that out of 65 children aged 3-5 years who were studied in Girirejo Village, there were 28 (43.1%) children with developmental disorders. Pesticide exposure in pregnant women can attack the fetus through the mechanism of metabolism from the mother's body to the fetus through the umbilical cord and placenta. Several types of pesticides can also interfere with thyroid function by increasing T4 metabolism, interfering with the delivery of T4 to the growing brain. Mothers who do not use complete PPE while working have a risk of 2,735 times causing developmental disorders in children compared to mothers who use complete PPE</p>
A4	<p>Writer: Winnoto, W., Darundiati, Y. H., & Setiani, O.</p>	<p>Relationship between Pesticide Exposure During Pregnancy and</p>	<p>This study was to determine the relationship between exposure to pesticides and</p>	<p>The population in this study were mothers who had pre-school-aged</p>	<p>This study uses a type of quantitative research with the analytic</p>	<p>The results of the study showed that 64% of respondents experienced child development disorders. According to research conducted by Bambang, the high</p>



<p>Journal Identity: PUBLIC HEALTH JOURNAL (e-Journal) Volume 4, Number 3, July 2016 (ISSN: 2356-3346)</p>	<p>Developmental Disorders of preschool children (4-5 Years) in Sumberejo Village, Ngablak District, Magellan Regency</p>	<p>the factors associated with the incidence of impaired growth and development of children living in agricultural areas</p>	<p>children (≤ 6 years) in Sumberejo Village, Ngablak District, namely 75 people. The sample used was 25 respondents</p>	<p>observational method, a cross-sectional approach. Research data collection was carried out using observation and interviews with respondents of mothers and children 4-5 years old as supporting research data. Gathering facts from specific phenomena or events and then entering general conclusions.</p>	<p>incidence of LBW (Low Birth Weight) of 25% in Ngablak Magelang District can be caused by several factors such as the condition of the mother, environmental pollution, and nutritional intake. (9) The result will be immaturity of the neurological system. and suboptimal motor and autonomic function in the early months of life. This can lead to suboptimal ability to maintain survival and ability to adapt to the surrounding environment. Some chemicals, pollution, food, and other habits can change many of the effects that occur in adults, and fetal development and will have long-term effects on the child's health process until adulthood. Other studies have revealed that toxins in the environment can interfere with child development</p>	
<p>A5</p>	<p>Writer: Sulistiyawati, S., Margawati, A., Rosidi, A., & Suhartono, S.</p> <p>Journal identity: Jurnal Gizi Indonesia (The Indonesian Journal of Nutrition) / 2019 / Vol 7 (2): 69-75</p>	<p>History of exposure to pesticides and lack of nutrient intake as risk factors for anemia in pregnant women in agricultural areas</p>	<p>This study was conducted to prove that inadequate intake of nutrients (protein, vitamin C, and iron) and a history of exposure to pesticides are risk factors for anemia in pregnant women in agricultural areas.</p>	<p>Population: Pregnant women with a gestational age of 24-40 weeks with pregnant women aged 20-35 years who check their pregnancies in the work area of the puskesmas in Brebes Regency</p> <p>Sample : 41 cases (anemia) and 41 controls (not anemia).</p>	<p>This study uses a case-control approach. The sampling technique used purposive sampling by matching the educational level of pregnant women.</p>	<p>The results showed that 73.2% of pregnant women who were exposed to pesticides had anemia, 63.4% of pregnant women who were deficient in protein had anemia, 80.5% of pregnant women who were deficient in vitamin C were anemic, and 73.2% of pregnant women who were deficient in iron anemia. This proves that there is a relationship between lack of intake of nutrients (protein, vitamin C, and iron) and a history of exposure to pesticides in the incidence of anemia in pregnant women.</p>



A6	<p>Writer: Rahmawati, A. et al</p> <p>Journal identity: Proceedings of the 3rd Borobudur International Symposium on Humanities and Social Science 2021 (BIS-HSS 2021)</p>	<p>The Relationship between Pesticide Exposure in Pregnant Women and the Incidence of LBW at the Sawangan 1 Public Health Centre, Magelang Regency</p>	<p>To determine the relationship between exposure to pesticides and the incidence of low birth weight, namely less than 2500 grams as the basic cause of neonatal death</p>	<p>Population: All mothers with live births in the last 1 year at the Sawangan 1 Health Center</p> <p>Sample: 50 respondents (25 people for the case group and 25 people for the control group)</p>	<p>Analytical observation al quantitative research with a case-control approach. Sampling was carried out using the purposive sampling technique and data was processed using the Chi-Square statistical test</p>	<p>Statistical test results using the Chi-Square test showed that there was a significant relationship between exposure to pesticides and the incidence of LBW with pregnant women who were exposed to pesticides more likely or two times more likely to give birth to babies with low birth weight than pregnant women who were not exposed to pesticides.</p>
A7	<p>Writer: Lubis, F. H. & Ningsih, T. A.</p> <p>Journal Identity: Journal of Public Health and Nutrition</p>	<p>Analysis of Risk Factors for Pesticide Exposure in Pregnancy with Low Birth Weight (LBW) in Padangsidim City in 2019</p>	<p>To determine the risk factors for exposure to pesticides associated with the incidence of low birth weight</p>	<p>Population: All mothers with live births who have worked as farmers</p> <p>Sample: The case group was 25 farmers with a history of giving birth to LBW and the control group was 25 farmers without a history of LBW</p>	<p>Analytical survey research with a case-control approach. Data analysis using univariate and bivariate analysis (Chi-Square and Fisher as an alternative)</p>	<p>There is a relationship between the mother's work as a farmer and the incidence of LBW. Pregnant women who carry out agricultural activities and have direct contact with pesticides are more at risk of being exposed to pesticides so they can increase the risk of LBW</p>



A8	Writer: Septiana, D., Suhartono, S., & Dewanti, N. A. Y. Journal Identity: Journal of Public Health/2021/Vol. 9(2): 187-194	The relationship between pesticide exposure before pregnancy and the incidence of hypertension in pregnant women in the agricultural area of Sumowon District, Semarang Regency	To find out and analyze the relationship between pesticide exposure before pregnancy and hypertension in pregnant women in the agricultural area of Sumowono, Kelurahan Semarang.	102 respondents. 57 out of 102 respondents were pregnant women whose work was related to pesticides.	This research method uses a Case-Control study design to test the hypothesis of the relationship between the independent variable and the dependent variable with a retrospective approach.	There is a significant relationship between work related to pesticide exposure and the incidence of hypertension in pregnant women, the period of exposure to pesticides and the incidence of hypertension in pregnant women, the duration of exposure to pesticides and the incidence of hypertension in pregnant women, the frequency of exposure to pesticides and the incidence of hypertension in pregnant women, practice mixing pesticides with the incidence of hypertension in pregnant women and the use of personal protective equipment with the incidence of hypertension in pregnant women.
A9	Writer: Ehrenstein, O. S., Ling, C., Cui, X., Cockburn, M., Park, A. S., Yu, F., Wu, J., & Ritz, B. Journal Identity: British Medical Journal (BMJ)/ 2019/ Vol. 364 (1962): 1-9	Prenatal and infant exposure to ambient pesticides and autism spectrum disorder in children: population-based case-control study	To examine the relationship between early development to ambient pesticides and autism spectrum disorders.	Population: The 2961 individuals with a diagnosis of autism spectrum disorder including 445 with comorbid intellectual disabilities were identified through the California Department of Developmental Services records linked to their birth records.	This research method uses a population-based case-control study design. Autism spectrum disorder case records were retrieved from a registry maintained by the California Department of Developmental Services.	The findings indicated that the risk of offspring with autism spectrum disorder was increased after prenatal exposure to ambient pesticides within 2000 m of their mother's residence during pregnancy, compared with offspring of women from the same agricultural area without such exposure. Subsequent infant exposure may increase the risk of autism spectrum disorder with comorbid intellectual disability
A10	Writer: Lenth, J. N., Suhartono, S., & Dharminto, D.	Correlation between History of Pesticide Exposure During Pregnancy	To determine the relationship between the history of exposure to pesticides	756 population and obtained 50 sample respondents	The research method is a quantitative type using an observation	From the results of this study, the relationship between the history of involvement in agricultural activities during pregnancy and the incidence of LBW. This



<p>Journal Identity: Public Health Journal (e-Journal)/ 2018/Vol 6(4): 453-462</p>	<p>and LBW in Kec. Blado Kab. Stem</p>	<p>during pregnancy and the incidence of LBW in Blado District, Batang Regency.</p>	<p>al analytic approach, with a case-control study design.</p>	<p>is because exposure to pesticides hurts thyroid hormones which are important in the growth and development of the fetus. Therefore, pesticides can cause miscarriages, and premature births and increase the number of birth defects. There is also a significant relationship between the length of work and the incidence of LBW. This is because the longer a person carries out agricultural activities, the higher the chance of being exposed to pesticides which ends in LBW.</p>
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DISCUSSION

Pregnant women are a vulnerable population with unique considerations when it comes to pesticide exposure. Pesticides, which are commonly used in agricultural and residential settings, may pose risks to both maternal and fetal health. Exposure to pesticides can hurt the nervous system, neurodegenerative, cognitive, and psychomotor disorders, growth and development, and disruption of nerve cell development during pregnancy, and early life in children and adults. Pesticide exposure can hurt the reproductive system such as changes in hormones, ovaries, damage to fertility, premature birth, LBW, defects, and spontaneous abortion (Kurniyawan et al., 2023). This paper aims to explore the potential health effects of pesticide

exposure on pregnant women and discuss strategies to mitigate these risks. Understanding the impact of pesticides on this population is crucial for the development of effective public health policies and Interventions. Mitigation strategies should focus on minimizing pesticide exposure among pregnant women. (Yushananta *et al.*, 2021)

This can be achieved through improved education and awareness programs, regulatory measures to restrict pesticide use near residential areas and during sensitive periods of pregnancy, and promoting the adoption of safer alternative pest control methods in agricultural practices. (Kurniyawan et al., 2023). Additionally, healthcare providers play a vital role in counseling pregnant women about potential risks and offering guidance



on reducing exposure. The review identified several potential health effects of pesticide exposure on pregnant women. Pesticide exposure during pregnancy has been associated with an increased risk of adverse pregnancy outcomes, including preterm birth, low birth weight, and congenital abnormalities. (Sulistiyawati et al., 2019). Moreover, studies have suggested that pesticide exposure may contribute to gestational diabetes, preeclampsia, and impaired fetal growth. Maternal pesticide exposure has also been linked to potential long-term health consequences for both mothers and their offspring, such as an increased risk of childhood obesity and neurodevelopmental disorders. (Ehrenstein et al., 2019).

To minimize the potential risks associated with pesticide exposure during pregnancy, several strategies can be considered. Implementing strict regulations on pesticide use, promoting the use of alternative pest management approaches, and providing education and training for farmers and agricultural workers on safe handling and application of pesticides are important steps. Furthermore, healthcare providers should be aware of the potential risks and provide appropriate counseling and support to pregnant women regarding pesticide exposure. (Septiana et al., 2021).

CONCLUSION

Exposure to pesticides in pregnant women has a very influential impact on their health. Health problems that can occur as a result of exposure to pesticides include hypertension, anemia, low birth weight babies, developmental disorders of preschool children, and autism problems. Pregnant women exposed to pesticides are more likely or 2 times more likely to give birth to children with LBW when compared to pregnant women who are not exposed to pesticides. Factors for the occurrence of these health problems can result from incomplete use of PPE in spraying pesticides and consuming fruit or vegetables that are not washed clean from exposure to pesticides. To reduce this problem, health workers can conduct counseling regarding the handling of pesticide exposure to pregnant women in agricultural areas. In addition, to reduce exposure to pesticides, pregnant women are expected to wash fruits or vegetables that have been purchased cleanly to avoid consuming the remaining pesticides, use complete PPE when participating in spraying pesticides, which consists of using gloves, masks, wearing special clothes, boots, glasses, and hats, as well as being able to avoid things related to pesticides in advance so that health problems do not occur that can affect



pregnant women and the fetus they contain.

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