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LBW incidence based on socio-economic, Hb level and compliance of pregnant women taking Fe supplements



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ABSTRACT

Introduction: Low birth weight (LBW) is a condition of fetal growth failure characterized by birth weight of fewer than 2,500 grams. LBW is influenced by several factors, including socio-economic, perinatal nutrition, infectious diseases, maternal hemoglobin levels, and pregnant women's compliance with taking iron tablets. This study aimed to examine the association between each risk factor toward the incidence of LBW.

Methods: This study with a case-control design used a retrospective approach. From a population of 450 mothers with 0-10 months old babies, 35 LBW incidences were found, and 35 normal-weight babies were selected randomly. Questionnaires were used to identify pregnant women's socio-economic status and compliance with consuming Fe supplements. At the same time, the data for Hb levels and identification of LBW incidences were taken from the MCH (maternal child health) handbook. Statistical analysis used SPSS 16 with Somers'd correlation test.

Results: The results showed that the correlation between education ($p < 0.001$), socio-economic (income) ($p = 0.002$), Hb level ($p < 0.001$), and the compliance of pregnant women taking Fe supplements ($p < 0.001$) were correlated with the incidence of LBW. It is necessary to optimize the consumption of iron tablets through assistance during pregnancy.

Conclusion: Based on the results of the study that has been conducted, it can be concluded that there is a correlation between socio-economic (education and income), Hb levels, and compliance of pregnant women taking Fe supplements with the incidence of LBW.

Keywords: LBW, socio-economic, HB level, Fe supplements.

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INTRODUCTION

Creating children's health start from the womb is a goal for health development. A mother's health in the prenatal period is crucial for the baby's health because health problems during pregnancy affect the fetus's health at birth and further baby growth.¹ Baby's weight at the birth time becomes a parameter for a newborn. Normal baby weight is the expected condition because it is a factor for the baby to pass and adapt to a new environment so that the baby's growth normally runs.² Low Birth Weight (LBW) is a condition for newborns that weigh less than 2500 grams, while a term or normal newborn with a gestational age of 37-42 weeks has a normal weight of 2.500-4000 grams.^{2,3}

The risk of morbidity and mortality in LBW incidences is high. Neonatal mortality is caused by low birth weight, reaching 38.03%, which is the highest

number compared to other causes.² LBW is one of the triggers for malnutrition in the Situbondo Regency, with a prevalence of 631 newborns (6.74%).⁴ The highest LBW incidences in Situbondo Regency in 2014 occurred in Jangkar District (10.92%) and Bungatan (10.87%), while the lowest cases occurred in Kapongan District 3.8%. Meanwhile, LBW incidences in 2016 reached 699 newborns (7.69%). The highest LBW incidences occurred in Asembangus (11.41%) and Jaguar (11.07%).^{4,5}

LBW incidences are estimated at 15% of all births globally; around 3.3%-38% more often occur in developing countries and low socio-economic conditions.³ Pregnant women with low socio-economic status have a greater risk for 4.93 times to have LBW newborn than those with high socio-economic status.² Socio-economic status can be seen using education and income indicators. Low education can

cause a lack of information about maternal and fetal health, which causes a lack of knowledge about good pregnancy care.³ Meanwhile, family income can affect the process of daily food consumption choice. The fulfillment of nutritional needs will be hampered for low-income families, even though nutritional deficiencies in pregnant women affect the fetus's condition and impact the incidence of LBW.⁶

The fulfillment of nutritional needs of pregnant women can be fulfilled by consuming minerals and nutritious food. Minerals are micronutrients needed in small amounts but essential and shall be fulfilled during pregnancy. Iron is one of the micronutrients, and it is deficient for pregnant women, impacts decreasing hemoglobin (HB) levels. HB is a general parameter that is used to diagnose anemia.¹ The decreasing of this HB level occurs in the second trimester of pregnancy because, at this time, the hemodilution

process occurs.

HB levels of pregnant women less than 11 g/dl indicate they suffer from anemia. Iron deficiency can inhibit fetal growth in both body and brain cells. In addition, it can increase the risk of LBW for their babies, bleeding before and during delivery, and even being the cause of maternal and infant mortality. It can contribute to the rate of perinatal mortality. In east java, the maternal mortality rate (2012) reached 97.43 per 100.000 live births and the infant mortality rate (IMR) 28.31 per 1000 live births.⁵ Cases of anemia in pregnant women in Indonesia in 2006 were 24.5% (12), increasing to 37.1% in 2012.^{4,7}

This iron deficiency has been anticipated by giving blood supplement tablets to pregnant women. However, the practice of giving iron tablets by health workers is still not optimal. It is not uncommon that giving iron tablets to pregnant women is low in some areas. The low compliance of pregnant women mainly triggers the low coverage of consumption of Iron tablets in pregnant women in consuming iron tablets. The compliance of pregnant women taking iron tablets is one of the essential factors in increasing their Hb levels.^{6,8}

The prevalence of anemia in pregnant women due to iron deficiency is still high.⁹ Besides compliance with pregnant women taking Fe tablets, other risk factors supporting LBW, such as socio-economic and identification of Hb levels in pregnant women, also need to be studied. Based on this background, it is deemed necessary to conduct a study on socio-economic correlation studies, Hb levels, and compliance of pregnant women in consuming Fe tablets to the LBW incidence at the Jangkar Public Health Center, Situbondo Regency.

METHODS

General Background of Research

This study used a case-control design. It is conducted in the work area of Jangkar Public health center, Situbondo Regency. The data collection is carried out from January to February 2018.

Sample of Research

This study's population was mothers with 0-10 months old babies, with 450 people

total. The subjects or samples in this study were 70 people who met inclusion criteria. The selected 70 people are divided into 35 mothers with BLW incidences and 35 other normal baby weights (taken by simple random sampling).

Instrument and Procedures

The socio-economic variable and compliance of pregnant women in consuming iron tablets are taken primarily (taken directly from the respondents) by conducting the interview guided by the questionnaire. While the Hb levels and LBW variable are collected from secondary data from the MCH book. In addition, it is analyzed with SPSS program version 16 using Somers'd statistical test with $\alpha = 0.05$.

Data Analysis

Data were analyzed using SPSS program version 16 using Somers'd statistical test with $\alpha = 0.05$. The research instrument (questionnaire) has gone through validity and reliability. This research has also passed the ethical test by the Jember State

Polytechnic Ethics Committee in 2019.

RESULTS

This study's results include identifying the characteristics of the respondents, the distribution of the frequency of variables, and the results of the correlation test of socio-economic variables (income), Hb levels, and compliance of pregnant women taking Fe tablets.

Table 1 shows that most respondents were 20-35 years old (88.6%), had a middle education level (50.0%), and 38.6% had a low education level. Meanwhile, the highest income level is low education (51.4%).

Independent variable (Hb levels, compliance of pregnant women taking Fe tablets)

Table 2 showed that 62.9% of respondents had normal Hb levels, and 24.3% had severe anemia. Judging from the level of compliance of pregnant women in consuming Fe tablets, it is known that most pregnant women are obedient

Table 1. Characteristics of Respondents by Age, Education, and Occupation.

| Characteristics of Respondents | Frequency N | Percentage % |
|--------------------------------|----------------|-----------------|
| Age (year) | | |
| 20-35 | 62 | 88.6 |
| <20 and >35 | 8 | 11.4 |
| Education | | |
| Low | 27 | 38.6 |
| Middle | 35 | 50.0 |
| High | 8 | 11.4 |
| Income | | |
| Low | 36 | 51.4 |
| High | 34 | 48.6 |

Table 2. Frequency Distribution of Hb Levels and Compliance in Consuming Fe Tablets.

| Independent variable | Frequency N | Percentage % |
|---|----------------|-----------------|
| Hb Levels | | |
| Severe Anemia | 17 | 24.3 |
| Moderate Anemia | 9 | 12.9 |
| Normal | 44 | 62.9 |
| Compliance in Consuming Fe Tablets | | |
| Less obedient | | |
| Obedient enough | 23 | 32.9 |
| Obey | 22 | 31.4 |
| LBW Incidence | 25 | 35.7 |
| LBW | | |
| Non LBW | 35 | 50 |
| | 35 | 50 |

(35.7%), and 32.9% of respondents are less obedient. Meanwhile, the incidence of LBW is 50%.

Socio-Economic Correlation (Education and Income), Hb Levels and Compliance of Pregnant Women taking Fe Tablets with LBW incidence

Table 3 showed socio-economic status; for instance, the education level affected the baby's birth weight. Somers'd correlation test shows a relationship between mothers and LBW's educational status with $p\text{-value} < 0.001$ ($p < 0.05$). The correlation r -value of 0.632 indicates that the strength of the correlation between the two variables is quite strong and positive, where the respondent with a low education level will be at risk of having babies with LBW.

DISCUSSION

The level of education of pregnant women is related to the extensive knowledge possessed by pregnant women. Pregnant women with low levels of education affect lack of knowledge, especially knowledge related to maintaining the condition of the mother and fetus during pregnancy, such as conducting prenatal care, types of nutritious food, and the portion that must be consumed which help fetal growth.

Meanwhile, respondents with higher education levels will have broader insights and have an open mindset to receive new knowledge that is considered helpful for their pregnancy and the initiative to seek as much information as possible regarding their pregnancy. The higher the education, the faster to receive and understand information so improving the knowledge.⁶

In addition, the mothers' educational backgrounds affect their attitude in choosing health services and food consumption patterns which are also related to the increase in their weight during pregnancy which of course affects the LBW incidence.² This fact is in line with the results of a study, which shows that mothers with low levels of education find it difficult to accept innovations from health workers because some respondents claim to have more confidence in their parents' experiences or personal experiences in previous pregnancies. Most also do not know the importance of prenatal care, such as antenatal visits. Antenatal visits

Table 3. Socio-Economic Correlation (Education and Income), Hb Levels and Compliance of Pregnant Women taking Fe Tablets with LBW incidence.

| Variable | LBW Incidences | |
|--|----------------|-------|
| | p | r |
| Education | 0.000 | 0.632 |
| Income | 0.002 | 0.343 |
| Hb Levels | <0.001 | 0.449 |
| Compliance of Pregnant Women taking Fe Tablets | <0.001 | 0.480 |

in good pregnancy control are performed at least four times, routinely during pregnancy, once in the first trimester, once in the second trimester, and twice in the third trimester.³

Visiting during pregnancy, better known as antenatal visits, include routine pregnancy check-ups and counseling. This antenatal service aims to maintain the physical or mental health of the mother and baby by providing education about nutrition, childbirth, early detection of pregnancy complications, and information on the management of medical, surgical, and obstetric complications during pregnancy and how to overcome them.⁶

Socio-economic status (income) correlates with birth weight, based on the Somers'd correlation test, $p\text{-value} = 0.002$. It means that if the mother has a low-income level, the LBW tendency is also low (LBW). The income level of respondents who have babies with LBW is mostly <Rp. 1,487,355/ month. Most of the respondents who have low incomes work as farm laborers. It causes families to be less able to fulfill food availability and nutritional intake to maintain maternal health and fetal development.

Most mothers with low incomes have babies with LBW, although some families with low-income levels have babies with normal birth weight. The results show that mothers with low incomes and minor family members can still routinely carry out pregnancy check-ups and meet their nutritional needs.³ Income is one of the determinants of the quality and quantity of food consumption. Families with high-income levels tend to be more concerned with food quality than those with low incomes. Families with limited income have a pattern of choosing food consumption, including obtaining sufficient food in quantity. They have not prioritized the nutritional content of the

selected food.

Indirectly, family income affects the incidence of LBW as mothers with low family incomes generally have lower quality food intake. This fact will have an impact on the low nutritional status of pregnant women.¹⁰

The Somers'd correlation test results between Hb levels, and LBW are obtained at a $p\text{-value} = 0.000$, which means a significant correlation between maternal Hb levels during pregnancy and LBW incidences. The correlation value of r is 0.449, which indicates that the correlation between the two variables is quite strong. Mothers with severe anemia status potentially have babies with LBW.

Iron deficiency anemia occurs as not enough iron is absorbed from daily food to form red blood cells, causing an imbalance between the intake and use of iron in the body. Pregnancy requires adequate blood flow to fulfill the nutrients needed to support the growth of the placenta and fetus.¹

Apart from insufficient intake of iron, anemia can also be triggered by consumption patterns, especially in consuming certain foods that can inhibit iron absorption. These foods and beverages include tea and coffee, which contain tannins and polyphenols; spinach stalks which contain oxalate; and egg whites which contain albumin.^{6,8}

The correlation between maternal compliance in consuming Fe tablets during pregnancy with LBW shows a $p\text{-value} < 0.001$, indicating a relationship between compliance in consuming Fe tablets and LBW incidence. The correlation value of r is 0.480, which indicates a quite strong relationship between the two variables. A disobedient mother who consumes Fe tablets risks having a baby with LBW. This study illustrates that most mothers with low Hb levels have babies

with low birth weight. Low levels of Hb can be influenced by the mother's lack of knowledge about the types of food sources of iron and foods that can increase Hb levels, such as liver, red meat, beans, green vegetables, egg yolks, and seafood such as fish.

Mothers who have an adequate intake of iron sources consume Fe tablets regularly. In contrast, they still have low Hb levels, which, based on interviews, are caused because mothers often consume several foods that can inhibit iron absorption, for example, tea and coffee. Most mothers believe that if pregnant women consume coffee during pregnancy, it can cause the baby to be born to have clean skin. Another mother believes that consuming seafood such as fish during pregnancy is believed to cause the baby to be born to smell fishy. This condition causes the lack of fulfillment of iron in pregnant women and impacts low Hb levels.

This eating habit (food belief) describes behavior related to a person's eating, eating patterns, dietary restrictions, food distribution in the family, food preferences, and how to choose food. Adequate vitamins and minerals are needed to form red blood cells. Besides iron, micronutrient such as vitamin B12 and folate are required for proper hemoglobin production. Deficiency in any one of them can lead to anemia due to a lack of red blood cell production. Inadequate dietary intake is an essential factor that causes low levels of folic acid and vitamin B12.

The level of compliance of mothers who have LBW babies in consuming Fe tablets tends to be less obedient. The results of this study are supported by data on Hb levels that have been carried out. Compliance in consuming Fe tablets and Hb levels are associated with anemia conditions. A study by Indri et al., 2019 stated that there is a relationship between compliance in consuming Fe tablets with Hb levels of pregnant women.¹

Mothers never efforts to increase the iron absorption in the body, such as optimizing the intake of vitamin C, which helps absorption inhibitors such as tea and coffee. Consumption of iron tablets once a day regularly is a government program to

prevent iron anemia in pregnant women who are not anemic.

Pregnant women with anemia can consume three tablets a day regularly. The results show that some pregnant women state that they do not agree to take Fe tablets using plain water, arguing that drinking tea or coffee while taking Fe tablets is a way to relieve nausea due to the side effects of the Fe tablets. The habit of drinking tea and coffee less than 2 hours after eating has a risk of suffering from anemia almost two times (1.84%).^{1,6,8}

During pregnancy, iron plays an essential role because iron is required double as blood volume increases. If the Hb level is insufficient and this happens continuously, pregnant women can risk experiencing severe anemia. The impact of anemia not only occurs in pregnant women but also on the growth and development of the fetus.

Another factor that causes pregnant women to be less obedient in consuming Fe tablets is the long duration of consumption, namely during pregnancy (9 months); this causes respondents to forget often and get bored taking Fe tablets. Many admit that they do not know about the function of Fe tablets for pregnant women. So other determinant factors causing the low level of compliance of pregnant women taking iron tablets and knowledge factors also need to be studied. The determinant factors include forgetfulness, fear of the baby becoming big, lack of awareness about the importance of iron tablets, and the threat of anemia caused by taking iron tablets.⁸

CONCLUSION

Based on the results of the study that has been conducted, it can be concluded: that there was a correlation between socio-economic (education and income), Hb levels, and compliance of pregnant women taking Fe supplements with the incidence of LBW. This finding need to be validated by further studies with a larger sample number and more comprehensive design.

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CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

AUTHOR CONTRIBUTION

All authors similarly contribute to the think about from the investigate concepts, information acquisitions, information investigation, factual investigations, changing the paper, until detailing the consider comes about through publication.

ETHICAL CONSIDERATION

This research was approved by the Health Research Ethics Committee of Politeknik Negeri Jember. Letter of exemption Ref. No. 1253/EC.KEPK/UMS/2020.

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REFERENCES

1. Indri OAN, Endah WA, Amareta DI. Hubungan Faktor Predisposisi terhadap Kepatuhan Ibu Hamil dalam Mengonsumsi Tablet Besi dan Kadar Hemoglobin di Puskesmas Mangli Kabupaten Jember. *J Kesehat*. 2019;5(3):154–65.
2. Sujianti. Hubungan Usia Ibu dengan Kejadian Bayi Berat Lahir Rendah (BBLR) di RSUD Cilacap. *Kesehat Al-Irsyad*. 2018;XI(1):62–7.
3. Simarmata OS. Hubungan Kualitas Pelayanan Antenatal Terhadap Kejadian BBLR di Indonesia (Analisis Data Sekunder Survei Demografi Dan Kesehatan Indonesia Tahun 2007). 2010;135.
4. Situbondo K. Kabupaten Situbondo Tahun 2011. 2012;
5. Dinkes. PROFIL KESEHATAN PROVINSI JAWA TIMUR TAHUN 2016 [East Java Health Profile 2016]. Provinsi Jawa Timur, Dinkes. 2016;
6. Indreswari M, Hardinsyah H, Damanik MRM. Hubungan Antara Intensitas Pemeriksaan Kehamilan, Fasilitas Pelayanan Kesehatan, Dan Konsumsi Tablet Besi Dengan Tingkat Keluhan Selama Kehamilan. *J Gizi dan Pangan*. 2008;3(1):12.
7. Purwaningtyas ML, Prameswari GN. Faktor Kejadian Anemia pada Ibu Hamil Higeia J *Public Heal Res Dev*. 2017;1(3):84–94.
8. Tatiana R. Perbandingan efektivitas terapi besi intra vena dengan terapi besi oral pada anemia defisiensi besi dalam kehamilan : laporan pendahuluan. 2006;(April 2007):110454.

9. Sinaga RJ, Hasanah N. Determinan Kejadian Anemia pada Ibu Hamil di Puskesmas Tunggakjati Kecamatan Karawang Barat. JUKMAS J Untuk Masy 2019;3(2):179-92. Available from: <http://ejournal.urindo.ac.id/index.php/jukmas/article/view/607>
10. Rosita R, Soepardi J. Pusat Data dan Informasi Profil Kesehatan Indonesia 2010 [Internet]. Direktorat Jendral Kesehatan Ibu dan Anak.

2011. Jakarta. Available from: <http://www.depkes.go.id>



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