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Comparison of Low Birth Weight Incidence Between the Program and Non-Program of the First 1000 Days of Life

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ABSTRACT

Currently, Indonesia is facing a challenge regarding the issue of low birth weight (LBW) infants, including in South Sulawesi, which contributes to infant mortality. Data shows an increasing incidence of LBW in South Sulawesi from 2.94% in 2013 to 8.13% in 2015. This article also discusses the First 1000 Days of Life (HPK) program as an effort to improve maternal and child health in Indonesia. The research conducted is a descriptive survey using a cross-sectional study design. The research sample consists of pregnant mothers who participate in the First 1000 Days of Life program and those who do not participate in the program in the city of Makassar. The objective of this study is to determine the incidence of LBW among program participants and non-participants of the First 1000 Days of Life program at PSPD UINAM in the city of Makassar. Research findings: The incidence of LBW among active program participants is lower, with a total of 1 (4%) out of 26 infants, compared to a higher incidence of LBW among non-program participants, with a total of 8 infants (31%) out of 26 infants. Conclusion: The incidence of LBW in the city of Makassar is higher among pregnant mothers who do not participate in the program compared to those who do participate

INTRODUCTION

The Indonesian government continuously strives to improve the quality of health in Indonesia, including child health. Based on data reported by 34 provinces to the Directorate of Nutrition and Maternal and Child Health, in 2021, there were 3,632,252 newborn babies who were reported to have their weight measured (81.8%). Among the newborns who were weighed, there were 111,719 cases of low birth weight (2.5%). This number represents a decrease compared to the previous year, which recorded 129,815 cases of low birth weight (3.1%). (Ministry of Health, 2021)

The direct causes of infant mortality in Indonesia are Low Birth Weight (LBW) (15-20%), asphyxia (44-46%), birth trauma (2-7%), infection (24-25%), and congenital defects (1-3%). Low birth weight (LBW) is a condition where a baby is born weighing less than 2500 grams, regardless of gestational age. Additionally, LBW is one of the main causes of early preterm mortality (Nursusila, 2017). The issue of LBW is a significant concern, as the World Health Organization (WHO) states that 60-80% of infant deaths are caused by LBW. Other data from WHO in 2014 showed that out of 172 countries worldwide, Indonesia ranked 70th with a percentage of 10.69% of deaths due to LBW. In South Sulawesi alone, the percentage of LBW incidence increased from 2.94% in 2013 to 3.02% in 2014, 8.13% in 2015, and decreased to 3.58% in 2016 (Dinkes Sulsel, 2016). Based on LBW incidence according to the district profile of South Sulawesi Province, there were a total of 149,929 infants affected, with the highest LBW incidence occurring in Makassar City (690 cases), Gowa Regency (342 cases), Luwu Regency (288 cases), and the lowest cases in Barru Regency (27 cases), Bantaeng Regency (47 cases), and Tana Toraja Regency (65 cases) (Dinkes Makassar, 2016).

In the case of LBW, the pregnancy period is crucial for determining fetal growth and human health throughout their lives. Malnutrition during pregnancy can have an impact on fetal development, which can affect brain function and intelligence levels, resulting in decreased achievement in children. This can lead to reduced productivity and affect the quality of human resources in a nation. Therefore, meeting nutritional needs during pregnancy aims to fulfill the nutritional requirements of both the mother and the fetus (Ministry of Health of the Republic of Indonesia, 2021).

Recognizing this issue, the Indonesian government has implemented a program to address maternal and child nutrition called the First 1,000 Days of Life (HPK) program, also known as the Scaling Up Nutrition (SUN) Movement by the World Health Organization (WHO). The program, initiated by the Maternal and Child Nutrition Study Group from the John Hopkins Bloomberg School of Public Health in 2010, has become a global movement in addressing maternal and child health in developing countries. Indonesia is one of the 35 countries implementing this movement through a national nutrition acceleration program called the First 1,000 Days of Life or the 1000 HPK movement (Sumarmi, 2017).

The 1000 HPK movement has inspired the Medical Education Program at Alauddin Makassar University (PSPD UINAM) as a learning program for students to improve maternal and child nutrition, particularly at every community health center (Puskesmas) in Makassar. The program involves assigning one student to monitor and guide the nutritional needs of one pregnant woman for the duration of the first 1,000 days, approximately until the child is 2 years old.

The presence of students is crucial in monitoring the First 1,000 Days of Life movement, as they play a role in monitoring the growth and development of pregnant women to ensure the birth of healthy children. The focus of student supervision in this program includes maintaining adequate and diverse nutrition during pregnancy, ensuring that the mother's body mass index (BMI) and upper arm circumference (MUAC) are within normal conditions, providing education on personal and environmental health, monitoring a minimum of 4 Antenatal Care (ANC) visits during pregnancy, screening for potential pregnancy complications, and participating in monitoring and recording of deliveries. By effectively implementing these program supervision activities, it is expected that the quality of pregnancy and infant growth will improve, ultimately preparing for a future generation of high-quality individuals (Chalid, 2016).

METHOD

Study Design

This study is an analytical observational study developed with a cross-sectional research design, using quantitative analysis. It involves an in-depth analysis of numerical data to determine the differences between the 1000 Days of Life Program (1000 HAK) implemented by PSPD UINAM and non-program in several community health centers (Puskesmas) in Makassar.

Location and Time of Study:

1. Study Location: The study is planned to be conducted in the following community health centers (Puskesmas) in Makassar, South Sulawesi: Batua Raya, Tamalanrea, Kapassa, Minasaupa, Kassi-Kassi, Dahlia, Tarakan, Bara Baraya, and Maradekaya.
2. Study Time: The study will commence in February 2019.

Research Approach: This study utilizes an analytical observational research design with a cross-sectional approach. In the cross-sectional approach, the measurement of the dependent variable, which is Low Birth Weight (LBW), and the independent variable, which is the 1000 Days of Life Program, is conducted simultaneously at the same time and only once.

Population and Sample:

1. Population: The population for this study consists of all pregnant women in Makassar.
2. Sample: The sample for this study is selected using the purposive sampling technique. It includes 26 pregnant women who participate in the 1000 HAK program conducted by PSPD UIN Alauddin and are guided by students, as well as 26 pregnant women who do not participate in the 1000 HAK program.

Inclusion and Exclusion Criteria:

1. Inclusion Criteria: a. Pregnant women participating in the 1000 Days of Life Program at UIN Alauddin Makassar. b. Pregnant women willing to participate in the study. c. Pregnant women delivering at full term. d. Pregnant women delivering live-born infants. e. Pregnant women delivering vaginally.
2. Exclusion Criteria: a. Pregnant women who are less active in participating in the 1000 HAK program. b. Pregnant women with multiple pregnancies (e.g., twins). c. Pregnant women with infectious diseases, severe anemia, hypertension, heart disease, or asthma. d. Pregnant women who smoke or consume alcohol. e. Pregnant women unwilling to participate in the study.

Types and Sources of Data: The data used in this study are secondary data. The secondary data is obtained through the 1000 HAK application and medical records from the community health centers (Puskesmas).

Data Collection Method: Data collection for this study is primarily conducted by submitting a request letter to the administrators of the 1000 HAK application and the respective community health centers (Puskesmas) in Makassar. After obtaining permission, observations and data recording are performed based on medical records and the 1000 HAK application data, which are then documented in an observation table.

Instrumentation

The research instrument used in this study consists of specific tables to record the required data from the 1000 HAK application and medical records.

Research Results and Discussion

This research was conducted in the working areas of Batua Raya, Tamalanrea, Kapassa, Minasaupa, Kassi-Kassi, Dahlia, Tarakan, Bara Baraya, and Maradekaya community health centers in Makassar, South Sulawesi, from February 2nd to July 2nd, 2020. In data collection, secondary data was obtained from the 1000 HAK application and medical records related to the 1000 HAK program and LBW. The collected data was then processed using tables in an Excel program according to the research objectives and presented in tabular form, classified as follows:

1. Characteristics of Research Subjects: The research subjects are all pregnant women aged 18-35 years and newborn babies residing in Makassar, specifically in the working areas of Batua Raya, Tamalanrea, Kapassa, Minasaupa, Kassi-Kassi, Dahlia, Tarakan, Bara Baraya, and Maradekaya community health centers. The total number of samples used in this study is 52.

Table 1. Frequency Distribution of Reserch Subjects

Variable	Active Program		Non Program		Total	
	n	%	n	%	n	%
Mother's Age						
18 – 25	2	8	6	23	8	15
26 – 35	16	61	13	50	29	56
>35	8	31	7	27	15	29
Mother's Education						
Elementary	3	12	3	12	6	11
Junior High	8	31	6	23	14	27
Senior High	11	42	16	61	27	52
University	4	15	1	4	5	10
Mother's Occupation						
Housewife	22	85	25	96	47	90
Civil Servant	4	15	1	4	5	10
Nutritional Status						
Underweight	10	38	13	50	23	44
Normal	16	62	13	50	29	56
Pre-pregnancy BMI						
Underweight	5	19	2	8	7	13
Normal	6	23	8	31	14	27
Overweight	15	58	16	61	31	60
ANC History						
Inadequate	0	0	11	42	11	21
Adequate	26	100	15	58	41	79
LBW Incidence						
LBW	1	4	8	31	9	17
Normal	25	96	18	69	43	83

Source: Secondary Data 2020

Based on the results in Table 1, it was found that the majority of the research subjects, 8 out of the total, or 15%, were pregnant women aged 18-25 years. Among these 8 women, 6 did not participate in the program, while the other 2 did. Furthermore, 29 individuals, or 56%, were aged 26-35 years, with 13 of them not participating in the program and the remaining 16 participating. Additionally, 15 individuals, or 29%, were above 35 years of age, with 7 of them not participating in the program and the other 8 participating.

In terms of the mothers' education, the majority had completed high school, accounting for 27 individuals or 52%. Among these 27 individuals, 16 did not participate in the program, while the other 11 did. This was followed by 14 individuals or 27% who had completed junior high school, with 6 of them not participating in the program and the remaining 8 participating. Those with a primary school education accounted for 6 individuals or 11%, with 3 of them not participating in the program and the other 3 participating. The smallest group consisted of 5 individuals or 10% who had received education up to college level. Among these 5 individuals, only 1 did not participate in the program, while the other 4 did. Regarding the occupation of the research subjects, the majority of them worked as housewives, totaling 47 individuals or 90%. Among these 47 individuals, 25 did not participate in the program, while the other 22 did. There were also 5 individuals or 10% who worked as civil servants (ASN), with 1 of them not participating in the program and the other 4 participating.

2. Univariate Analysis

Univariate analysis was conducted to assess the frequency distribution of relevant variables in relation to the research objectives before further analysis. In the univariate analysis, the proportions of the two sample groups taken by the researchers, the Active Program and Non-Program, were determined. This provided insight into the proportions of the independent variables (Nutritional Status, BMI, ANC History) and the dependent variable (LBW) in relation to these groups.

The frequency distribution of the variables in the analysis is as follows: According to Table 4.1, the majority of pregnant women had normal nutrition, totaling 29 individuals or 56%, while 23 individuals or 44% had Chronic Energy Deficiency. Among the pregnant women, 14 individuals or 27% had a normal BMI, 31 individuals or 60% had excess BMI, and 7 individuals or 13% had low BMI. Moreover, the majority of pregnant women had sufficient ANC visits, totaling 41 individuals or 79%, while 11 individuals or 21% had insufficient ANC visits. From the above data, it can be observed that 9

individuals or 17% of the pregnant women gave birth to LBW babies, while the majority, 3 individuals or 83%, had normal birth weights.

The table shows that there are 16 pregnant women in the active program group who have normal nutritional status, while the non-program group consists of 13 pregnant women. This indicates that the 1000 HAK program has a positive influence on the nutritional status of pregnant women.

The table presents the Body Mass Index (BMI) of pregnant women in the program group with active visits. There are 5 individuals with low BMI, 6 individuals with normal BMI, and 15 individuals with high BMI. On the other hand, the non-program group has 2 individuals with low BMI, 8 individuals with normal BMI, and 16 individuals with high BMI. This does not indicate a significant influence of the program on BMI since the BMI considered in the analysis is the pre-pregnancy BMI, which determines nutritional status based on pre-pregnancy weight gain.

The table displays the history of antenatal care (ANC) visits for pregnant women in the active program group, where 26 women had an adequate ANC history. In contrast, the non-program group had 11 individuals with insufficient ANC visits and 15 individuals with adequate visits. This indicates a positive influence of the 1000 HAK program on ANC attendance.

The table illustrates the birth weight of babies born to pregnant women who participated in the program with active visits. Out of the total, 1 baby was classified as having Low Birth Weight (LBW), while 25 babies had normal birth weights. In comparison, the non-program group had 8 babies with LBW and 18 babies with normal birth weights. This suggests a positive influence of the program on reducing the incidence of LBW.

Bivariate analysis is conducted with the aim of studying the influence and differences between each visit group and the occurrence of Low Birth Weight (LBW). These variables are analyzed using Excel-based tables, as shown below.

Table 2. Analysis Results

	LBW		Normal	
	n	%	n	%
Active Program	1	4	25	96
Non Program	8	31	18	69
Total	9	17	43	83

Source: Secondary Data 2020

Based on Table 2, it is known that the incidence of Low Birth Weight (LBW) is lower in the active program group and higher in the non-program group. This indicates the influence of active visits on the occurrence of Low Birth Weight, clearly demonstrating the comparison of LBW incidence between the active program and non-program groups.

Explain the Results of the Discussion

The age distribution of the respondents in this study mainly consisted of pregnant women, with 8 individuals or 15% of the total being aged 18-25, 29 individuals or 56% aged 25-35, and 15 individuals or 29% aged over 35. The age group of 18-25 is considered a vulnerable period during pregnancy. Data from the Basic Health Research (Rikesdas) in 2013 showed that the risk of maternal malnutrition (KEK) among pregnant women aged 15-19 was 38.5%, and 30.1% among those aged 20-24 (Ernawati, 2018). This age group represents the reproductive age of individuals, especially for pregnant women who may have various responsibilities and limited experience as expectant mothers due to their young age. This can impact their

nutritional intake and result in excessive physical strain, leading to poor birth weight quality.

Regarding the occupation of pregnant women, the majority were homemakers, comprising 47 individuals or 90%, while 5 individuals or 10% worked as civil servants (ASN). This can affect the health of pregnant women, as those with external occupations often face increased energy demands and insufficient nutrient intake, potentially leading to inadequate fetal growth and development (Ernawati, 2018). Excessive physical activity increases the nutritional requirements of individuals. In the case of pregnant women, they need to supply nutrition to both their own bodies and their developing babies, leading to increased nutritional needs. When combined with increased activity levels, the energy requirements also increase, which can adversely affect fetal development and growth.

Regarding the variable of maternal nutritional status, the table shows that there were 16 individuals in the active program group with normal maternal nutritional status, while the non-program group consisted of 13 individuals. This indicates the positive influence of the 1000 HAK program on the maternal nutritional status. Supported by research conducted by Pratama (2017), the 1000 HAK initiative can improve knowledge, attitudes, and dietary intake patterns of pregnant women, leading to positive effects on fetal growth and development. As the 1000 HAK program progresses, it is important for students to monitor nutrition during pregnancy to ensure adequacy (Chalid, 2016).

Program 1000 HAK has been implemented successfully, although there is still room for improvement as the data shows that some pregnant women are still affected by malnutrition (KEK), indicating that the program's objectives have not been fully achieved. With the implementation of this program, students can share the knowledge they have acquired from their professors with pregnant women, resulting in the transfer of knowledge about maternal nutrition. Moreover, students also play a role in monitoring and ensuring that pregnant women receive adequate nutrition. Therefore, active visits contribute to the improvement of maternal nutrition.

In terms of the variable IMT (pre-pregnancy body mass index), among the participants in the active program, 5 individuals had a low IMT, 6 had a normal IMT, and 15 had a high IMT. On the other hand, in the non-program group, 2 individuals had a low IMT, 8 had a normal IMT, and 16 had a high IMT. These findings are supported by a study conducted by Puspita (2019), which revealed a significant relationship between pre-pregnancy body mass index and birth weight, as indicated by a Spearman's correlation coefficient of 0.040 ($p < 0.05$).

Pre-pregnancy body mass index is one of the factors that determine maternal nutrition during pregnancy. The nutritional requirements vary based on the pre-pregnancy body mass index. If the pre-pregnancy body mass index is low, additional efforts are needed to meet the nutritional needs of pregnant women. Conversely, pregnant women with a normal pre-pregnancy body mass index require different nutritional interventions. This highlights the influence of the 1000 HAK program in improving maternal nutrition during pregnancy.

Regarding the variable of ANC (Antenatal Care) visits, among the participants in the active program, 26 pregnant women had adequate ANC visits. In contrast, the non-program group consisted of 11 pregnant women with insufficient ANC visits and 15 pregnant women with adequate ANC visits. These findings are supported by a study conducted by Juniarti (2016), which concluded that there is a relationship between the 1000 HAK program and maternal knowledge about nutritional monitoring.
One of the activities of the 1000 HAK program is to educate the pregnant women under its care. Consequently, each visit contributes to the knowledge enhancement of the visited pregnant women, leading to better nutritional practices. This includes attending ANC check-ups at the health center four times during pregnancy.

In terms of the dependent variable, which is birth weight, among the pregnant women participating in the active program, 1 baby was born with low birth weight (BBLR), while 25 babies had

normal birth weight. In the non-program group, 8 babies were born with low birth weight, and 18 babies had normal birth weight. These findings align with the research conducted by Indrawati (2015), which showed that 38.2% of pregnant women with a nutritionally at-risk status (KEK) experienced low birth weight, compared to 15.6% of pregnant women without nutritionally at-risk status.

Regarding maternal nutrition in the program group, only 10 pregnant women experienced malnutrition (KEK), while 16 had normal nutrition, as shown in Table 4.2. Since pregnant women with low nutritional status (KEK) are at risk of giving birth to babies with low birth weight, the 1000 HAK program becomes a solution for addressing maternal nutritional status through monitoring. It is evident that pregnant women who participate in the program maintain good nutrition and are less susceptible to low birth weight. The program's monitoring, education, and interventions have proven effective in reducing the incidence of low birth weight in Makassar City. This is supported by research conducted by Pratama (2017), which indicates that the 1000 HAK program improves knowledge, attitudes, and dietary patterns of pregnant women, ultimately benefiting fetal growth and development.

CONCLUSION

From the conducted research at Puskesmas Batua Raya, Tamalanrea, Kapassa, Minasaupa, Kassi – Kassi, Dahlia, Tarakan, Bara Baraya, Maradekaya from February 2 to July 2, 2020, it can be concluded that the incidence of LBW is lower in the active program group with a total of 1 baby (4%) out of 26 babies compared to the higher incidence of LBW in the non-program group with a total of 8 babies (31%) out of 26 babies.

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