MATERNAL AGE AND PREMATURITY ARE FACTORS ASSOCIATED WITH THE INCIDENCE OF BBLR IN KH HAYYUNG REGIONAL GENERAL HOSPITAL, SELAYAR ISLANDS, INDONESIA

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ABSTRACT

This study aims to determine the factors associated with the incidence of Low Birth Weight at KH Hayyung Hospital, Selayar Islands, given the increasing number of BBLR cases, and to use a quantitative case-control design. The sample consisted of babies born at KH Hayyung Hospital, Selayar Islands, who were selected purposively, resulting in a total of 50 samples. The research instrument was secondary data from patient medical records. The research data were analyzed using the chi-square test. The case group consisted of infants with a Birth Weight of less than 2500 g, while the control group consisted of infants with a Birth Weight of greater than 2500 g. Data were obtained from medical records throughout 2023 at KH Hayyung Hospital. Crosstabs were performed on the variables of education (no schooling, low, high), maternal age (at risk, not at risk), parity (primi and multi), and prematurity (term, premature), collected through purposive sampling. There were 25 cases and 25 controls with differences in the variables of education and parity which did not have a significant relationship to the incidence of Low Birth Weight at KH Hayyung Hospital in 2023 with a value of $\rho>0.05$ which means that there is no significant relationship, while the variables of maternal age and prematurity ($\rho <0.05$) had a substantial relationship to the incidence of Low Birth Weight at KH Hayyung Hospital in 2023. So, what is associated with the incidence of Low Birth Weight at KH Hayyung Hospital, Selayar Islands, in 2023 is the mother's age and prematurity.

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Highlights:

1. All recorded samples show that no mothers have a smoking habit, with a low socioeconomic status and the majority ethnic group being the Selayar tribe.

2. The KH Hayyung Regional Hospital in Selayar Islands, maternal age and prematurity are the main factors related to the incidence of low birth weight infants, compared to the factors of education level and parity.

INTRODUCTION

Low Birth Weight (LBW) is still a public health problem in many countries[1]. There are an estimated 20 million low birth weight babies worldwide, and 90% of them are in developing countries[2]. Based on the results of the 2020 Basic Health Research, the average proportion of all LBW cases in Indonesia was 11.37%[3], with a rate of 7.1%[4] in South Sulawesi Province. The incidence of LBW in the Selayar Islands region, based on data from the Selayar Islands Health Office in the last 3 years (2020 - 2022), was 21.71% (2020), 24.70% (2021), and 24.49% (2022) of the total number of babies born. There was an increase from 2020 to 2021, followed by a decrease from 2021 to 2022, but the change was not significant. Still, the number of LBWs is relatively large. From the incidence of LBW in Selayar Islands Regency, the number of Low Birth Weight babies in KH Hayyung Hospital, Selayar Islands, has increased in the last 3 years, based on data from the monthly report of the perinatology / NICU room, namely 13.41%, 17%, and 20% of baby births. The latest data from January to October 2023 show a 25.6% incidence of Low Birth Weight at KH Hayyung Hospital in the Selayar Islands, Indonesia, indicating a significant increase. The number of Low-Birth-Weight deaths since January 2023 was 18 babies.

Pregnancy in adolescence (<20 years) poses challenges for the adolescent herself and for the unborn child, associated with an increased risk of pregnancy complications[5,6]. Whereas at the age of more than 35 years, the health of the mother has declined as a result, pregnant women at that age have a greater chance of having children with disabilities[7], prolonged labor[8], bleeding, and babies born with low birth weight conditions (Low Birth Weight)[9].

Parity affects the incidence of Low Birth Weight because the uterus that has given birth to many children tends to be inefficient in all stages of labor[10,11].

Education influences a person's habits, behavior, thoughts, and feelings. Heavy and tiring work can cause contractions, leading to premature birth[12]. Education is an intermediary factor that contributes to poor nutritional status in pregnant women, resulting in Low Birth Weight (LBW)[13]. Babies born before term have a greater chance of being born with Low Birth Weight[14].

This study aims to determine the factors associated with the incidence of Low Birth Weight at KH Hayyung Hospital, Selayar Islands, Indonesia, in 2023.

MATERIALS AND METHODS

The research design employed a case-control design, utilizing retrospective reports of pregnant women from secondary data, medical records, and monthly reports of Perinatology/NICU Care in 2023. The population in this study consisted of all babies born in 2023, with secondary data sources from NICU Care at KH Hayyung Hospital, Selayar Islands, Indonesia and retrospective reports of pregnant women at KH Hayyung Hospital, Selayar Islands. Cases are babies with low birth weight (less than 2500 grams according to the criteria).

Controls are babies born weighing more than 2500 grams. The population in this study comprised all babies born at KH Hayyung Hospital, Selayar Islands. Samples were taken by purposive sampling, namely by using the sample size formula[15].

$$= \frac{r+1}{r} \frac{(p^*)(1-p^*)\left(Z_\beta + Z_{\frac{\alpha}{2}}\right)^2}{(p_1 - p_2)^2}$$

This takes into account the prevalence of LBW in the last year. The study included 25 babies with normal birth weight (control group) and 25 babies with abnormal birth weight (case group), randomly selected from patient medical records that met the sample inclusion criteria.

The study was conducted at KH Hayyung Hospital, Selayar Islands, in January 2024. Under the supervision and approval of the Health Research Ethics Commission (KEPK) of the Faculty of Medicine, Universitas Airlangga, as stated in the Certificate of Ethical Feasibility, No. 22/EC/KEPK/FKUUA/2024, on January 18, 2024

RESULT

In this study, the respondents were predominantly non-smokers. Of the 50 samples, all of them did not have a smoking habit, came from mothers with low socioeconomic levels (27 samples), the dominant tribe of babies born at KH Hayyung Hospital Selayar Islands is the Selayar Tribe, have a low level of education, namely 26 samples, dominant between 20-30 years old (age not at risk), namely 32 people, in both case and control groups were dominant with multiparous categories as many as 14 samples and also predominantly from mothers with aterm gestation (not prematurity).

However, when viewed in terms of their respective proportions. Mothers with prematurity gave birth to more Low Birth Weight babies than normal weight babies, while mothers with non-prematurity (at term gestation) gave birth to more normal weight babies than Low Birth Weight babies.

Bivariate analysis was then conducted on maternal education level, maternal age, parity, and prematurity to examine the incidence of Low Birth Weight at KH Hayyung Hospital, Selayar Islands, in 2023, using the Chi-Square test. A significant correlation was found between maternal age and the incidence of prematurity, resulting in low birth weight (p-value < 0.05). Unlike the variables of education and parity, where the p-values are greater than 0.05, indicating no relationship with the incidence of Low Birth Weight.

Table 1. General Characteristic and Bivariate Analysis.

Variables	BBLR				Total		*p-value*
	Case	%	Control	%	n	Total	
Smoking Habits							
No Smoking	25	50	25	50	50	100	
Social Economy							
High	2	4	5	10	7	14	
Medium	10	20	6	12	16	32	
Low	13	26	14	28	27	54	
Tribe							
Selayar	23	46	14	28	37	74	
Bugis	2	4	8	16	10	20	
Konjo	0	0	3	6	3	6	
Education Level							
Low	11	22	15	30	26	52	0.198
High	14	28	10	20	24	48	
Age of Mother							
At Risk	16	32	2	4	18	36	0.000
Not at Risk	9	18	23	46	32	64	
Parity							
Primi	11	22	8	16	19	38	
Multi	14	28	17	34	31	62	
Prematurity							
Yes	10	20	1	2	11	22	0.002
No (Aterm)	15	30	24	48	39	78	
Total	25	100	25	100			

DISCUSSION

This study is in accordance with previous studies that found a significant relationship between the age of pregnant women and the incidence of LBW[16]. In accordance with WHO recommendations that a healthy reproductive age of 20 to 35 years is a safe age for pregnancy and childbirth[17]. The data show that some young women are already in their third or fourth pregnancy[18], meaning their first pregnancy was at an early age[19]; this suggests they married and gave birth to their first child at an early age[20]. So that babies are born to mothers whose age is still relatively young (age at risk <20 years)[21] which has an impact on less optimal growth[22] because the nutritional needs during adolescence are needed by their own body[23].

The data shows that the incidence of LBW babies does not only occur in preterm pregnancies. Pregnancies with a term age are also not a few born with LBW, even though the existing data from mothers who gave birth at KH Hayyung Hospital, Selayar Islands in 2023 showed that a term age was dominant, but babies with premature births contributed a lot to the incidence of LBW. Other studies have also suggested that preterm events account for many low birth weight births[24]. Gestational age at the time of delivery is premature or premature babies are at greater risk of giving birth to low birth weight babies (LBW)[25] compared to mothers whose gestational age at the time of delivery is full term (aterm) or babies born at term (aterm) because the baby's organs are not yet fully matured[26].

Researchers were unable to incorporate additional risk factors associated with LBW because the variables

used were limited to secondary data, specifically medical records. However, there are other assumptions related to LBW incidence, such as ANC, nutritional intake, and socioeconomic status, which can be optimized for future research. The advantage of this study is that the results can provide additional knowledge about BBLR in RSUD KH Hayyung Kepulauan Selayar. A weakness of this study is that it relies on bivariate analysis to determine the relationship between maternal age and prematurity, as well as the incidence of BBLR.

CONCLUSION

Based on bivariate analysis, maternal age and prematurity were significantly associated with LBW at KH Hayyung Hospital, Selayar Islands, in 2023.

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None.

CONFLICT OF INTEREST

There are no conflicts of interest.

ETHIC CONSIDERATION

This research has obtained ethical approval from the Health Research Ethics Commission (KEPK) of the Faculty of Medicine, Universitas Airlangga, as stated in the Certificate of Ethical Feasibility, No. 22/EC/KEPK/FKUUA/2024, on January 18, 2024.

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AUTHOR CONTRIBUTION

The authors indicated in parentheses made substantial contributions to the following tasks of research: initial conceptualization (D.S., P.L); design (D.S., E.D), collection of data (D.S); analysis and interpretation of data (D.S., A.); writing and revision of paper (D.S., P.L., E.D., A.G., A).

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