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CONSEQUENCES OF BIRTH INTERVAL ON NEWBORN HEALTH

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ABSTRACT

Babies with Low Birth Weight (LBW) are more at risk of occurring at short birth intervals than at longer birth intervals. The reproductive capacity of women can decrease and return to the primiparous state in women who experience long birth intervals which can also be risky for the baby. The purpose of this study was to determine the consequences of birth spacing on the health of newborns. This study uses two methods, both quantitative and qualitative. The quantitative method uses data from the 2017 IDHS with a cross-sectional research design. The sample of this research is mothers who gave birth in the last five years and had at least 2 (two) pregnancies. The results of this study found that 9.8% experienced short birth spacing and 7.2% of babies born with low birth weight. This study confirms the existence of a relationship between birth spacing and the incidence of LBW babies. Short birth interval risks giving birth to babies with LBW. It is hoped that the results of this study will become an initial reference for designing policies on birth intervals to improve newborn health and reduce infant mortality.

Kata Kunci:
BBLR,
jarak kelahiran,
kesehatan ibu dan bayi

ABSTRAK

Kelahiran bayi dengan Berat Badan Lahir Rendah (BBLR) lebih berisiko terjadi pada jarak kelahiran pendek dibandingkan jarak kelahiran yang lebih panjang. Kapasitas reproduksi wanita dapat menurun dan kembali ke keadaan primipara pada wanita yang mengalami jarak kelahiran panjang, sehingga dapat berisiko juga bagi bayi. Tujuan penelitian adalah untuk mengetahui konsekuensi jarak kelahiran terhadap kesehatan bayi baru lahir. Penelitian ini menggunakan dua pendekatan, yakni kuantitatif dan kualitatif. Pendekatan kuantitatif menggunakan data SDKI tahun 2017 dengan desain penelitian cross sectional. Sampel penelitiannya adalah ibu yang melahirkan dalam lima tahun terakhir dan minimal 2 (dua) kali kehamilan. Hasil penelitian ini didapatkan 9.8% yang mengalami jarak kelahiran pendek dan sebanyak 7.2% bayi lahir dengan berat badan lahir rendah. Penelitian ini menegaskan bahwa terjadinya BBLR, ada hubungannya dengan jarak kelahiran. Jarak kelahiran pendek berisiko melahirkan bayi dengan BBLR. Pentingnya hasil penelitian ini diharapkan menjadi acuan awal untuk merancang kebijakan tentang jarak kelahiran untuk meningkatkan kesehatan bayi baru lahir dan menurunkan angka kematian bayi.

INTRODUCTION

Short birth intervals are associated with an increased risk of prematurity and low birth weight (LBW). Apart from that, it also increases the risk of fetal death and early neonatal death. Birth spacing of less than 18 months was associated with a twofold increased risk of death compared with birth spacing of more than 36 months(1). Short intervals between births can cause health problems for babies and children and even maternal death. Research shows short birth spacing is a risk factor for premature birth and neonatal death (2). Other research states that the incidence of LBW is significantly associated with inadequate antenatal care, maternal weight before giving birth of 55 kg, maternal height≤145 cm, weight gain during pregnancy of 6 kg, birth spacing <36 months, maternal exposure to smoking, low socioeconomic status, and anemia (3). For women who experience long birth intervals, the woman's reproductive capacity can decrease and return to a primiparous state, which can also pose a risk to the baby (4).

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One important factor in neonatal mortality and morbidity is LBW (5). According to data from the World Health Organization (WHO) in 2014, the prevalence of LBW is estimated at around 15 to 20% worldwide, and more than 20 million babies suffer from LBW (6). Every year, 16% of live births worldwide are related to LBW, where around 20 million babies are born weighing under 2,500 grams. This was reported in less developed countries as much as 18.6%, in developing countries as much as 16.5%, and in developed countries as much as 7% (7). One of the WHO's action plans is to reduce the birth rate of babies weighing under 2,500 grams by 30% by 2030, which means a decrease in LBW babies by 3% per year since 2012 (8).

Birth spacing is also influenced by the deaths of previous babies and children. Couples who experience the death of a previous baby will tend to have short birth spacing because of the couple's hope of immediately replacing the child who died (9). The background above explains the importance of birth spacing in the incidence of infant mortality and the health status of newborns. The aim of this research is firstly to identify the relationship between birth distance and the health status of the last baby born based on data from the 2017 Indonesian Demographic Health Survey (SDKI), secondly to determine the relationship between research components and informants, and thirdly to identify and analyze the consequences of birth distance on the baby's health.

METHODS

This research uses quantitative and qualitative approaches. The quantitative method was the first method chosen. Through this method, the independent variable chosen is birth interval, and the dependent variable is babies born with LBW. Secondary data sources were taken from the results of the 2017 Indonesian Health Demographic Survey or *Survei Demografi dan Kesehatan Indonesia* (SDKI). The 2017 SDKI sample covers all provinces in Indonesia. The unit of analysis for this research is women aged 15-49 years who have experienced at least two births.

SDKI data collection was downloaded from the Demographic and Health Survey (DHS) website by the access policy (https://microdata.worldbank.org/index.php/catalog/3477). Procedures and questionnaires for the IDHS followed Standard DHS survey protocols approved by the Inner City Fund (ICF), Institutional Review Board (IRB) and Department of Health and Human Services regulations United States of America for the Protection of Human Subjects. The 2017 SDKI ethical clearance refers to the DHS-7 project which is an ethical review conducted by the ICF IRB on March 11, 2015.

The inclusion criteria in this study were women who gave birth in the last five years, namely from 2012 until the time the survey was conducted in 2017. Meanwhile, the exclusion criterion is respondents with incomplete data. Descriptive statistical analysis was carried out by tabulating the frequencies of the research variables observed. Next, a Chi-square test analysis was carried out to determine the relationship between birth interval and LBW status.

The qualitative method is the second method chosen in this research. Through this method, researchers chose components to be studied including birth spacing, infant mortality, premature babies, and LBW. The research data source uses primary data in the form of interviews with research informants. The primary data collection technique was carried out by conducting interviews with informants who experienced health problems in babies after birth. Informants in primary data were women who have given birth at least two times. The inclusion criteria for informants were women who had previously given birth once and whose newborns had health problems. The primary data population was 15 women who had newborn babies and were being treated in intensive care. Meanwhile, data analysis in qualitative research is narrative descriptive.

RESULT

Results of 2017 SDKI Data Analysis

The independent variable in this research is birth distance. The dependent variable is the health problems of newborn babies with LBW.

Table 1. Relationship between Birth Distance and LBW, IDHS2017

Variable/ category		LBW status				p value
		Normal		LBW		
Birth interval	≥ 24 months	8,899	(94.4)	525	(5.6)	0.000
	< 24 months	800	(78.3)	222	(21.7)	
	Total	9,699	(92.8)	747	(7.2)	

The data in Table 1 explain the results of bivariate data analysis which shows that birth spacing influences the occurrence of LBW. The data in the table show that 21.7% of respondents with short birth spacing gave birth to LBW babies.

Results of Analysis of Informant Interview Results

Research subjects are informants in qualitative research. Informants in this research are providers of information or knowledge about health problems experienced by mothers during pregnancy and childbirth, as well as health problems of newborn babies. Informants were selected using a purposive sampling technique by predetermined criteria, namely women aged 15-49 years who had given birth to at least two pregnancies.

There are two parts to the informant criteria in this study. The first is a mother who has just given birth to at least her second child and the second is a newborn baby who experiences health problems after delivery.

Eight informants experienced a long birth interval (more than 5 years), one informant experienced a short birth interval (under 2 years), and one informant experienced an optimal birth interval (2 to 5 years). The health problems experienced by newborns are prematurity, LBW, congenital heart disease (CHD), and sepsis which causes an old placenta.

DISCUSSION

The human body has the opportunity to repair, one of which is that the reproductive organs will prepare for the next pregnancy when the gap between births is more than two years (10). Furthermore, there are several factors related to birth spacing. Children who breastfeed for more than two years tend to have a longer birth interval than mothers who breastfeed for less than six months (11). With those having >2 living children, when the baby/child dies, the couple usually tries to get pregnant again so they can immediately replace the dead child (11). Short birth intervals are more likely to be experienced by women who do not use contraception than women who use contraception (12). Mothers' understanding and knowledge about birth spacing, contraception, and the mother's ability to seek information related to reproductive health are influenced by formal education (13). Women who have low incomes choose not to use contraception, resulting in unwanted pregnancies (14).

The results of bivariate analysis show that birth spacing influences the occurrence of LBW. The results of this study are in line with research in Jambi which stated that the risk of LBW was 1.944 times higher at risky birth spacing compared to ideal birth spacing (15).

Researchers found three themes from the results of informant interviews in qualitative research, those are birth spacing, health problems experienced by newborns, and maternal health problems when giving birth to the last child. Next, the researcher will discuss the three themes found in the results of the interviews.

Birth Distance

Most of the birth intervals for the children of informants interviewed by researchers were long birth intervals (>5 years). The range of long birth intervals experienced by informants was 5 to 12 years. The state of the experience Long birth spacing (>5 years), means a woman's reproductive capacity can decrease and return to a primiparous state, which can also be risky for the baby (4). One of the informants interviewed by researchers experienced a short birth interval, namely 11 months. Even though she had miscarried her previous child, after three months, the informant said she was pregnant again, and the child was born prematurely at 32 weeks of gestation. The ideal birth interval is more than 24

months. The reproductive organs can prepare to get pregnant again during that time (10).

One of the limitations of injectable hormonal contraception is that it takes a long time to restore fertility (16). In addition, the use of contraceptives in the form of injections for a long time disrupts the menstrual cycle and affects the balance of hormones in the body, namely progesterone and estrogen (17).

Apart from that, there was one informant whose birth distance was optimal, namely informant 2 with a birth distance of four years. However, the mother experienced post-term labor for more than 42 weeks so the baby experienced infection due to amniotic fluid poisoning.

Health Problems Experienced by the Last Child

The health problems experienced by informants' newborns with short and long birth intervals were LBW, premature babies, and infections due to amniotic poisoning. Babies of informants 1, 2, 5, 6, 7, 8, 9, and 10 were LBW and premature. Meanwhile, informant 3's baby had congenital heart disease, and informant 4 experienced sepsis due to amniotic poisoning.

This research states that birth spacing is related to the occurrence of health problems in children. This is in line with research that states that short and too-long birth intervals have been associated with an increased risk of several adverse perinatal outcomes, such as premature birth, low birth weight, small size for gestational age, and perinatal death (18). Other research also mentions that long birth intervals can be detrimental to the baby's health, such as premature birth, LBW, and small for gestational age babies (19).

Gestational age plays an important role in determining a baby's birth weight. Babies who are born prematurely (less than 37 weeks) are at higher risk of giving birth to babies with low birth weight. The World Health Organization (WHO) estimates that around a third of low birth-weight babies are caused by prematurity (18). A baby's birth weight is the single most important determinant of newborn survival because neonatal disease is generally closely linked to low birth weight (20).

Maternal Health Problems when Giving Birth to the Last Child

Almost all informants gave birth to premature and LBW babies. One of the informants experienced a twin pregnancy, the mother experienced continuous contractions at 32 weeks of gestation, and the baby was born premature and LBW. This is in line with research that states that mothers who are pregnant with twins are 3.4 times more likely to experience LBW than mothers who are pregnant with singletons (21).

Another informant experienced continuous contractions before delivery and premature rupture of membranes or *Ketuban Pecah Dini (KPD)*, so intervention was carried out with Sectio Caesarea (SC) and the baby was born prematurely and LBW. Childbirth with premature rupture of membranes has a 30.5 times risk of LBW compared to births without premature rupture of membranes (22).

Another health problem experienced by mothers is the presence of comorbidities during pregnancy. A total of two informants experienced illnesses during pregnancy, namely anemia and hypertension. Illnesses experienced by the mother during pregnancy also pose a risk of LBW. Research in Lampung states that pregnancies with a history of disease have a four times greater risk of LBW than pregnancies without a history of disease (21). Anemia in pregnancy causes the placenta to receive little blood flow, which in turn disrupts blood flow from the placenta which carries oxygen and nutrients to the fetus. Physiological changes in pregnant women cause an imbalance in the amount of blood plasma and red blood cells, which can be seen as a decrease in hemoglobin levels. This can disrupt the supply of oxygen to the uterus and nutrition to the fetus, resulting in disruption of fetal growth and in babies being born with LBW (23).

Consequences of Birth Spacing on Newborn Health Problems

The period between the last two children born is called the birth interval (24). A birth interval of less than 24 months is considered short and a birth interval of more

than five years is considered long. Short birth spacing and long birth spacing are considered risky (inadequate) (25). Birth spacing is classified as "adequate/sufficient" (interbirth interval more than equal to two years or less than five years), "short birth interval" (under two years), and "long birth interval" (over five years) (26). Birth spacing that is too short or too long directly affects the occurrence of risky pregnancies. Too close a distance between pregnancies can cause premature rupture of membranes, anemia, and bleeding. Therefore, couples are advised to plan and determine the spacing of their pregnancies (27).

A period of more than two years is the ideal distance between births during which time the reproductive organs will prepare to experience pregnancy again. Health problems in the reproductive system include the fetus experiencing obstacles to its growth and development. Risks that can occur when births are less than two years apart include newborn deaths, infant deaths, LBW, and also small portions of the child's body (10). Pregnancies with an interval of less than two years require a time interval that is appropriate for the physical health and condition of the pregnancy. In addition, mothers should continue to breastfeed and pay attention to children born early, as poor maternal conditions affect the health of the fetus and its birth weight (10).

The WHO states that LBW is a baby's weight at birth below 2500 grams (6). Low birth weight of babies remains a public health priority in the world with various consequences of this condition for babies in the short and long term. In general, around 15-20% of all births around the world experience LBW. This condition shows that every year there are more than 20 million births (6). One of the causes of infant death during the neonatal period is LBW. A baby weighing less than 2,500 grams has a 20 times greater risk of death compared to a baby with a normal weight (28). Research in Surabaya in 2016 found that the incidence of LBW was related to several factors including gestational age, multiple pregnancies, hypertension, and pregnancy anemia (29). This is to the results of qualitative research, where LBW experienced by mothers was due to premature birth, multiple pregnancies (informant 1), hypertension (informant 5 and 6), and anemia (informant 6).

The results of quantitative analysis based on 2017 IDHS data in this study show that, of the total mothers whose birth spacing was short, 21.7% gave birth to LBW babies. In contrast to the results of the qualitative analysis, nine out of ten informants with long birth intervals experienced health problems in their babies such as LBW, prematurity, amniotic poisoning infections, and congenital heart disease. The conclusion from both analyses is that birth spacing carries a risk of health problems for newborns. This is also found in research in Jambi 2017 which stated that respondents who had birth spacing were 1.94 times more likely to experience LBW than respondents with ideal birth spacing (30).

Birth intervals of more than five years can also influence the risk of pregnancy with preeclampsia. The incidence of pre-eclampsia has been a higher risk in pregnant women who experience risky birth intervals, namely birth intervals under two years and birth intervals over five years (31).

CONCLUSIONS AND SUGGESTIONS

Conclusion

This research concludes that birth spacing influences the health of mother and baby. Both short birth intervals and long birth intervals are risky for the health of the mother and baby. The consequences of risky birth spacing can cause health problems in the mother, such as hypertension, premature labor, premature labor contractions, and premature rupture of membranes. The consequences of birth spacing that pose a risk to newborn health problems are premature and LBW babies.

Suggestion

Optimal birth spacing can improve the health of mothers and babies born. The pursuit of birth spacing can be the main target for the government to improve the health of mothers and babies. Suggestions for women of childbearing age include 1) maintaining optimal birth spacing before planning a pregnancy, 2) if you use contraception, you should not use hormonal contraception, because it will take a long time for you to become fertile again, 3) if there is a possibility of pregnancy with a risky birth spacing, you

must have regular Ante Natal Care (ANC) checks to properly monitor the health of the mother and baby.

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