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Increasing LBW baby weight with the Kanguru method in the perinatology room of Bhayangkara Hospital Tulungagung

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***Abstract*---**The high infant mortality rate (IMR) is partly due to the increased prevalence of LBW. Appropriate management is needed in an effort to provide adequate care for infants with LBW. The purpose of this study was to determine the effect of giving the kangaroo method to low birth weight babies on increasing infant weight in the Perinatology Room at Bhayangkara Hospital Tulungagung in 2022.The research design used is Quasy Experiment with Post Test Only Group Control approach. The population is all babies with low birth weight in the perinatology room at Bhayangkara Hospital Tulungagung. The sample was some LBW infants in the perinatology room at Bhayangkara Tulungagung Hospital with a total of 30 respondents who were selected using the consecutive sampling method. This research instrument uses an observation sheet that is equipped with general research data. Data processing in the form of editing, coding, scoring, tabulating, and data analysis using non-parametric Independent T Test with SPSS program. The results of this study indicate that the average weight gain in the control group is 103 grams, while in the treatment group given kangaroo treatment 277 grams. The average body weight in the control group was 1991 gram, while in the kangaroo method treatment group was 2184 gram with the lowest body weight in the control group 1789 gram and the lowest weight in the kangaroo method treatment group was 1900 gram. Based on the independent t test statistical test obtained ρ value (0.001) with α (0.05). The results of this study are that there is an effect of kangaroo treatment on LBW on the increase in baby weight in the perinatology room of Bhayangkara Hospital Tulungagung. Kangaroo treatment method is one of the bounding actions that increase the emotional bond between mother and child and can provide comfort to the child so that the intensity of breastfeeding increases.

***Keywords*---**kangaroo mother care, lower baby weight, newborns.

Introduction

The infant mortality rate (IMR) is a measure commonly used to determine the degree of public health, both at the provincial and national levels. One of the main causes of infant mortality is low birth weight (LBW). LBW is divided into two categories, namely (1) LBW due to premature birth (gestational age less than 37 weeks), and (2) LBW due to intra uterine growth retardation (IUGR), namely babies born at term but underweight (Arora, 2018). There are 4 main causes of death in the perinatal period, namely congenital anomalies, gestational age and low birth weight, sudden infant death syndrome, and complications during pregnancy. LBW is a newborn who weighs less than 2500 grams at birth. LBW is one of the factors causing neonatal death, so there is a correlation between LBW, mortality and morbidity. Appropriate management is needed in an effort to provide adequate care for infants with LBW (Azwar, 2017).

Treatment using the kangaroo method is one of the bounding actions that increases the emotional bond between mother and child. In addition, the benefits of kangaroo treatment (PMK) can prevent colds because the mother's body temperature can provide warmth to her baby by contacting the mother's skin with the baby's skin (Blackwell, K., & Cattaneo, 2015). FMD also makes it easier for babies to meet nutritional needs, prevent infection and shorten the hospitalization period so as to reduce treatment costs (Bernstein, 2017). Based on WHO data, low birth weight (LBW) mortality is the second leading cause of death in infants in the world with a percentage of 16.6% per 1000 live births (Azwar, 2017). More than 20 million babies worldwide (15.5%) of all births are low birth weight babies (LBW) and 95.6% of them are babies born in developing countries (Azwar, 2017). The LBW mortality rate is still very high in the World Health Organization (WHO) report quoted from the state of the world mother (Rohsiswatmo, R., 2019) which states that 27% of neonatal deaths are caused by LBW. This number is estimated to be higher because of the mortality rate caused by sepsis, asphyxia, and some congenital abnormalities as well as low birth weight.

The results of the Indonesian Demographic and Health Survey (IDHS) show that from year to year the IMR has decreased significantly. In 2017 there were 24 deaths per 1,000 live births in Indonesia (IDHS, 2018). Head of the East Java Health Service (Dinkes), Dr Kohar Hari Santoso said, although still high, in 2016 the infant mortality rate in East Java was 23.60%, in 2017 the infant mortality rate was 23.10%. Meanwhile, in 2018 the infant mortality rate was 13.4 percent per 1,000 births (Hastono, 2019). Even though the trend in three years has decreased the infant mortality rate, but this figure is still high when compared to the target of reducing neonatal mortality to at least less than 12 per 1000 live births and under-five mortality to 25 per 1000 births in 2030. The high infant mortality rate is one of the the other is caused by LBW conditions in infants (Feldman, R., Eidelman, Al., Sirota, L., & Weller, 2019).

Based on a preliminary study conducted by researchers in the Perinatology Room of Bhayangkara Hospital, Tulungagung Regency on December 23, 2021, it was found that from 12 parents with low birth weight, most of them did not understand and did not know about kangaroo care, namely 10 respondents (83%). In interviews conducted by researchers with parents, almost all of them

said they were afraid and did not dare to apply PMK. The impact of LBW is very serious on the quality of future generations. Long-term problems that may occur as a result of LBW include impaired vision development (retinopathy), hearing, chronic lung disease, increased morbidity and frequency of congenital abnormalities and frequent hospital admissions. Direct complications in LBW are hypothermia, fluid and electrolyte disturbances, hyperbilirubinemia, respiratory distress syndrome, patent ductus arteriosus, infection, intraventricular hemorrhage, apnea of prematurity and anemia. (Gillis, L. A., Fairbanks, E. F., Crean, H., Small, L., Sinkin, R., & Xin T., 2016).

General management that can be given to infants with LBW is maintaining body temperature, regulating and monitoring nutritional intake, preventing infection, weighing weight, giving oxygen and monitoring the airway. One of the actions that can be given to babies with low birth weight is the kangaroo mother care (KMC) method (Hastono, 2019). This method is a free therapy that can be done by mothers because not all babies with LBW are able to get health services using advanced technology. Usually this is due to low socioeconomic factors, geography, transportation and communication (Hockenberry., J. & Wilson., 2009). This impact can be reduced by providing quality care, but costs, limited resources and the high cost of high-tech care required for LBW neonates, it is very important to examine alternative approaches to reduce separation between mother and baby sustainably, accept the costs and ease of implementation (Indrasanto , E., Dharmasetiawani, N., Rohsiswatmo, R., & Kaban, 2018). Kangaroo method care (PMK) is currently still rare to do in health services besides research studies that reveal the effectiveness of FMD with increasing body weight in LBW are also still few (Johnston, C., Filion, F., Campbellyeo, M., Goulet, C. ., Bell, L., Mcnaughton, K., & Byron, 2019) mainly research in the Tulungagung Regency area. Based on the above problems, researchers are interested in taking research on the Effect of Giving the Kangaroo Method to LBW on Infant Weight Gain in the Perinatology Room at Bhayangkara Tulungagung Hospital in 2022.

Method

Analytical research with quasi experimental design using Post Test Only Group Control Design approach. The purpose of this study was to determine the effect of giving the kangaroo method to low birth weight babies on the increase in infant weight in the perinatology room at Bhayangkara Tulungagung Hospital in 2022. The study was carried out on January 14 – February 6, 2022. The population was all babies with low birth weight in the ward. perinatology Bhayangkara Tulungagung Hospital. The sample in this study was some LBW infants in the perinatology room at Bhayangkara Tulungagung Hospital who met the research inclusion criteria with a total of 30 respondents who were selected using a consecutive sampling technique. The instrument uses an observation sheet with indicators for measuring baby weight and general respondent data such as initials of name, gender, age, and mother's milk production.

Results

Table 1
Distribution of general data characteristics of research respondents (n=30)

General data	f	%
Gender		
Male	14	47
Female	16	53
Food Type		
breast milk	15	50
Formula milk	4	13
Mixture	11	37
Breast milk production		
Well	15	50
Not enough	15	50

Based on the research data, it can be seen that the characteristics of the respondents by gender showed that of the 30 respondents studied, most of the respondents were female with a total of 16 respondents (53%). Based on the type of food, half of the 30 respondents consumed breast milk with a total of 15 respondents (50%). Based on breast milk production, half of the 30 mothers in the perinatology room had good milk production (50%) and the rest had poor milk production (50%).

Table 2
Distribution of the weight frequency of newborns in the perinatology room at Bhayangkara Tulungagung Hospital in the control group (n=30)

Weight Control	Mean	Median	Min	Max	SD
Weight	1991 gr	1980 gr	1789 gr	2200 gr	0.1

Based on table 2 shows that of 15 respondents in the control group the average weight was 1991 g, the median was 1980 g, the lowest weight was 1789 g, the highest weight was 2200 g and the standard deviation was 0.1.

Table 3
Cross tabulation of general data with weight of newborns in the perinatology room at Bhayangkara Tulungagung Hospital in the control group

General data	Weight			
	1700-2000gr		2001-2499gr	
	F	%	F	%
Gender				
Male	4	27	2	13
Female	5	33	4	27
Food Type				
Breast milk	1	7	6	40
Formula milk	2	13	0	0

Mixture	6	40	0	0
Breast milk production				
Well	1	7	6	40
Not Enough	8	53	0	0

Table 3 shows that of the 9 female respondents in the control group, most of them weigh in the range of 1700-2000 grams with a total of 5 respondents (56%). Based on food packaging, 7 respondents who received nutrition from breast milk in the control group mostly had body weight in the range of 2001-2499 grams with a total of 6 respondents (86%). Based on the production of breast milk, it was found that of the 8 respondents whose mothers had poor milk production in the control group, all of them had baby weight in the range of 1700-2000 grams with a total of 8 respondents (100%).

Table 4
Distribution of the frequency of newborn weight in the perinatology room at Bhayangkara Tulungagung Hospital in the kangaroo treatment group

Weight Control	BB Perlakuan	Mean	Median	Min	Max	SD
Weight	Berat Badan	2184 gr	2210 gr	1900 gr	2430 gr	0.2

Table 4 shows that of the 15 respondents in the treatment group, the average weight after being given the kangaroo method was 2184 grams, the median was 2210 grams, the lowest weight was 1900 grams, the highest weight was 2430 grams and the standard deviation was 0.2.

Table 5
Cross tabulation of general data with weight of newborns in the perinatology room at Bhayangkara Tulungagung Hospital in the kangaroo treatment group

General Data	Weight			
	1700-2000gr		2001-2499gr	
	f	%	f	%
Gender				
Male	2	13	6	40
Female	2	13	5	33
Food Type				
Breast milk	0	0	8	53
Formula milk	2	13	0	9
Mixture	2	13	3	20
Breast milk production				
Well	0	0	8	53
Not Enough	4	27	3	20

Table 5 shows that of the 8 respondents who were male after being given kangaroo treatment, most of them weighed in the range of 2001-2499 grams with a total of 6 respondents (75%). Based on the type of food, it was found that of the 8 respondents who received nutritional intake through breast milk after being

given the kangaroo method, all of them weighed in the range of 2001-2499 grams with a total of 8 respondents (100%). Based on breast milk production, it was found that of the 8 respondents whose mothers had good breast milk production after being given kangaroo method care, most of them weighed in the range of 2001-2499 grams with a total of 8 respondents (100%).

Table 6
Differences in weight of newborns in the control group and the kangaroo treatment group at Bhayangkara Tulungagung Hospital

Weight	Mean		Median		Min		Max		SD	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Control	1888	1991	1900	1980	1700	1789	2100	2200	0.1	0.1
Treatment	1991	2184	1980	2210	1789	1900	2100	2430	0.0	0.2

Table 6 shows that the average increase in body weight in the control group is 103 grams while in the group after being given kangaroo treatment it is 277 grams. The average in the control group was 1991 g, while in the kangaroo treatment group was 2184 g with the lowest weight in the control group was 1789 g and the lowest weight was in the kangaroo treatment group 1900 g. The results of statistical tests using an independent T test obtained value (0.001) with (0.05), because < then H0 is rejected, meaning that there is an effect of kangaroo treatment on low birth weight babies on increasing baby weight in the perinatology room at Bhayangkara Tulungagung Hospital.

Discussion

The weight of newborns in the perinatology room at Bhayangkara Tulungagung Hospital in the control group

Table 2 shows that of the 15 respondents in the control group, the average weight was 1991 g, the median was 1980 g, the lowest weight was 1789 g, the highest weight was 2200 g and the standard deviation was 0.1. Low birth weight babies range from 1500-<2500 grams. According to research conducted by (Atik, 2016) states that most respondents who experience low birth weight due to various factors, including premature rupture of membranes, placenta previa, placental abruption and others. In addition, birth weight gain is influenced by several factors such as nutritional intake, gender and maternal milk production. The results of this study are in accordance with the theory above that most of the respondents with low birth weight have an average weight of 1991 grams. This is due to various causes, it could be due to obstruction of the birth canal or due to pregnancy complications. Based on the research data, it was found that of the 9 female respondents in the control group, most of them weighed in the range of 1700-2000 grams with a total of 5 respondents (56%).

Research conducted by (Bera Alpanamayi. et al, 2017) states that babies with male sex generally have stronger roofing reflex abilities. So that male babies are usually stronger and last longer when breastfeeding. The results of this study are in line with the research that most of the research respondents who have female sex mostly have a body weight of less than 2001 grams. According to the

researchers, this was due to various factors, including the characteristics of the female respondents in this study, most of whom were less enthusiastic about breastfeeding, so that the weight gain was not significant. Based on research data, it was found that of the 7 respondents who received nutrition from breast milk in the control group, most of them weighed in the range of 2001-2499 grams with a total of 6 respondents (86%).

Research conducted by (Chan J Grace et al, 2016) states that the nutritional intake consumed by infants greatly determines the weight gain experienced by infants. This is supported by research conducted by (Feldman, R., Eidelman, Al., Sirota, L., & Weller, 2019) where most children who are exclusively breastfed have relatively more weight gain. This study is also in line with the results of the study that most of the respondents who received the nutritional intake of breast milk had weight above 2001 grams. According to researchers, this is because the micronutrient content contained in breast milk is very good for health and increases the baby's weight. Based on the research data, it was found that of the 8 respondents whose mothers had poor milk production in the control group, all of them had baby weight in the range of 1700-2000 grams with a total of 8 respondents (100%). (Indrasanto, E., Dharmasetiawani, N., Rohsiswatmo, R., & Kaban, 2018) states that the production of mother's milk will greatly affect the baby's weight. Research conducted by (Iran J Nurs Midwifery Res, n.d.) stated that most of the respondents whose mothers had good milk production, the baby's weight gain was very significant. This is because breast milk has complex nutrients and is good for increasing the baby's weight and health status. In line with the theory and the facts, the researchers found that most of the respondents whose mothers had good milk production, almost all of them weighed more than 2001 grams. According to researchers, this is because in addition to getting nutritional intake that is rich in many nutritional content, breast milk also contains lots of probiotics so that it is good for maintaining baby's health. The baby's health is maintained will increase the baby's appetite so that the daily nutritional intake will increase.

The weight of newborns in the perinatology room at Bhayangkara Tulungagung Hospital in the kangaroo method of treatment treatment group

Table 4 shows that of the 15 respondents in the treatment group, the average weight after being given the kangaroo method was 2184 grams, the median was 2210 grams, the lowest weight was 1900 grams, the highest weight was 2430 grams and the standard deviation was 0.2. Kangaroo method of care is an appropriate non-pharmacological intervention to increase body weight in infants with low birth weight. Based on research conducted by (Murti, N. N., Asnah, & Widiyaningsih, 2016) most of the babies after being given kangaroo treatment experienced a significant increase in body weight. The results of this study most of the respondents after being given kangaroo method treatment experienced an increase in body weight. According to the researcher, this is because when the kangaroo method is treated, there is bounding between mother and child. This can increase comfort in children so that children become more comfortable in consuming breast milk. Based on research data, it was found that from 8 respondents who were male after being given the kangaroo method, most of them weighed in the range of 2001-2499 grams with a total of 6 respondents (75%).

(Namnabati, M., Talakoub, T., & Mosaviasi, 2016) states that most of the respondents who are male are more and stronger in consuming breast milk. This is a natural trait that usually occurs in male babies who tend to have a stronger roofing reflex. In this study, it was found that most of the male respondents had a higher body weight than female respondents. According to the researchers, this is because most of the respondents who have a male gender are stronger in consuming milk so that their weight gains significantly faster. Based on the research data, it was found that of the 8 respondents who received nutritional intake through breast milk after being given the kangaroo method, all of them weighed in the range of 2001-2499 grams with a total of 8 respondents (100%). Research conducted by (Rini, D. S., & Puspitasari, 2016) states that nutritional intake plays an active role in increasing body weight in infants. Intake of nutrients through good and intense breast milk obtained by babies will increase body weight significantly.

The results of this study found that most of the respondents who received nutritional intake through breast milk had more weight than respondents who received nutritional intake other than breast milk. This is because breast milk contains a lot of nutrients and energy that can increase the baby's weight. Based on research data, it was found that of the 8 respondents whose mothers had good breast milk production after being given kangaroo treatment, most of them weighed in the range of 2001-2499 grams with a total of 8 respondents (100%). Based on research conducted by (Rohsiswatmo, R., 2019) states that the mother's milk production is very influential in increasing body weight in babies. Another supportive study was conducted by (Rule, 2017) where it was found that most mothers who had good breast milk production, most of their children's weight increased significantly. According to researchers, this is because the smooth production of mother's milk will greatly affect the baby's weight gain. Babies who get optimal nutritional intake through breast milk will increase the immune system in the body, so that babies have good resistance. The healthy condition of the baby will make the baby have a maintained appetite so that the absorption of nutrients can be carried out optimally.

The effect of kangaroo treatment on LBW on increasing infant weight in the perinatology room at Bhayangkara Hospital Tulungagung

Based on table 6, it was found that the average increase in body weight in the control group was 103 grams, while in the group after being given kangaroo treatment it was 277 grams. The average in the control group was 1991 g, while in the kangaroo method treatment group was 2184 g with the lowest weight in the control group was 1789 grams and the lowest weight was in the kangaroo treatment group 1900 grams. Based on statistical tests using an independent T test, it was found that value (0.001) with (0.05), because < then H0 was rejected and H1 was accepted so that there was an effect of kangaroo treatment on LBW on increasing baby weight in the perinatology room at Bhayangkara Hospital Tulungagung. Kangaroo method care (PMK) is an effective way to meet the most basic needs of LBW, namely warmth, breast milk, protection from infection, stimulation, safety and love (Depkes RI, 2008). In addition, with the kangaroo method of care, milk production increases and the frequency of breastfeeding

becomes more frequent, so that the effect on increasing body weight is better (Silvia. et al, 2018).

This theory is in line with the conditions in the field after the mother did FMD, there was a more significant increase in the baby's weight when compared to the group that was not given the kangaroo method of care. According to the researchers, this is due to the effect of kangaroo care and weight gain on low birth weight babies because the baby is relaxed, resting in a pleasant position, resembling the position in the womb, so that the baby's anxiety is reduced and sleeps longer. In this condition, oxygen and calorie consumption are at the lowest level, so the existing calories are used to increase body weight. Hasil penelitian ini sejalan dengan penelitian sebelumnya yang dilakukan oleh (Suwaibah, 2018) tentang pengaruh penerapan metode kanguru dengan peningkatan berat badan bayi baru lahir rendah (BBLR) di rumah sakit PKU Muhammadiyah Gombang, menemukan bahwa rata-rata berat badan sesudah perawatan kanguru adalah sebesar 2250 gram. The kangaroo method of care is beneficial in stabilizing the baby's body temperature, heart rate and respiratory stability, baby behavior is better, crying less and breastfeeding often, calorie use is reduced, baby's weight gain is better, baby's sleep time is longer, baby-mother bonding is better. good and will reduce the occurrence of infection in infants. The Kangaroo Method is an early care method with skin-to-skin contact between mother and newborn in a kangaroo-like position. With this method, it is able to meet the breastfeeding needs of premature newborns by providing situations and conditions that are similar to the mother's womb. This gives them the opportunity to adapt well to the outside world.

Conclusion

Based on the data obtained from this study, it showed that of the 15 respondents in the control group the average weight was 1991 g, the median was 1980 g, the lowest weight was 1789 g, the highest weight was 2200 g and the standard deviation was 0.1. Based on the data obtained from this study, it was found that of the 15 respondents in the treatment group, the average weight after being given the kangaroo method was 2184 g, the median was 2210 g, the lowest weight was 1900 g, the highest weight was 2430 g and the standard deviation was 0.2. Based on the statistical independent t test, it was obtained value (0.001) with (0.05), because < then H0 was rejected and H1 was accepted so that there was an effect of kangaroo method care on LBW on increasing baby weight in the perinatology room at Bhayangkara Tulungagung Hospital.

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