Related Factors of Discontinue Kangaroo Mother Care at Home for Low Birth Weight Infant after NICU Discharge

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Abstract—LBW infant suffered a health problem in the early days after birth and continue after hospital discharge. Continued KMC implementation is needed to enhance neonatal survival. This study is aimed to know the description and the influence factors in KMC implementation at home after hospital discharge. A descriptive study with cross sectional approach was used. 49 mothers of LBW infant were participated in this study using a convenience sampling method during the study period August 2018 to March 2019 on one largest hospital in one city in Indonesia. Several significant factors that influenced a continuing KMC implementation at home in the first day after hospital discharge were mother KMC skill competency before discharge (p <0.006 and OR 6.250), Infant discharge weight (p <0.001 and OR 8.914) and length of hospital stay (p <0.015 and OR 4.433). Several stop reason by 36 mothers on 14 days after hospital discharge included baby uncomfortable and fussy 8 (16.33%), the baby weight enhanced 9 (18.37%), the baby health going well 2 (4.1), busy 9 (18.37%), and never did KMC since at hospital 8 (16.33%). The education, health care provider support and continue follow-up at home are needed for enhanced the mother's responsibility and awareness to doing KMC at home.

Index Terms—kangaroo mother care, home KMC implementation, factor influencing KMC, and hospital discharge

I. INTRODUCTION

Low Birth Weight (LBW) is defined as weight at birth less than 2500 g (5.5 lb.) that occurring in 15% to 20% of all births worldwide, representing more than 20 million births a year and approximately 70% of these infants death in neonatal period [1]-[3]. 96,5% of them are born in developing countries [4] and Indonesia as one of them that ranked fifth highest for preterm birth rates in the world, accounting for approximately 15.5 per 100 live births [5]. LBW is a leading cause of mortality in children under five years age and also at high risk of health problem in first-month life such as hypothermia, respiratory distress, infection, hyper bilirubin, hypoglycemia, experience more intubations and complications during delivery [6]. These health problems often continuing after hospital discharge such as growth delay (stunting and obesity), developmental delay (lower IQ, cognitive delay, language, learning, and school difficulties) and physical illness later in life (diabetes and cardiovascular disease) [2], [7]. Effective and comprehensive interventions are needed to enhance new-born baby and neonatal survival, growth and development [1]. One of intervention is discharge planning education program for mothers. Mothers is primary care provider at home and have to ready for the discharge of LBW infant from hospital to home [8]. The mother have to enhance their ability to resolving the problem at home [9]. One of discharge education program in Indonesia is kangaroo mother care.

Kangaroo Mother Care (KMC) has identified as one approach that broad benefit, cost-effective and most effective intervention to enhance neonatal survival [1]. The benefit of KMC is over incubator care was reported in many studies in a systematic review such as lower risk mortality, increase exclusive breastfeeding, lower risk infection, reduce hypothermia, strongly protective against hypoglycemia, decrease the likelihood hospital readmission, reduce neonatal pain and other outcomes [10]. KMC was initiated by the World Health Organization (WHO) to reduce infant mortality in developing countries such as Indonesia [11]. KMC is recommended implementation in low-income and developing countries where facilities and human resources for the care of LBW infant are limited [12] including a limited number of nursing staff when compared with the number of patients, the uneven competencies of intensive care nurse and limited medical equipment [13]. One study revealed KMC implementation barrier in Indonesia including human resource and staff issues (staff number, workload and rotation), infrastructure and budgets, and lack of access post-discharge continuity care for LBW infant [14]. KMC at the hospital in this study is implemented after the infants achieved physiology condition is stable (Does not have difficulty breathing, does not have difficulty drinking, does not suffer seizures or diarrhea and mother or family are willing and not sick). The mothers and family were taught by nurse and physician with

knowledge and skill to implemented KMC and they must achieve a baseline score of KMC discharge scale before hospital discharge. Hence, the aims of this study are to know the description and the influence factors in KMC implementation at home after hospital discharge.

II. METHOD

A. Design and Sample

This study was a descriptive study with cross sectional approach. that begins since the baby hospitalized in NICU and follow-up in two weeks after hospital discharge. The initial for possible recruited in this study were mothers that have infants ≤2500 g who were admitted to NICU during the study period August 2018 to March 2019, the mother's age 17 years old and above, the mother as a primary caregiver of the premature infant after discharge. The mothers are excluded if they have critically ill and not to survive to discharge and the baby that readmitted in NICU. The hospital was used in this study is a large tertiary hospital in South Sulawesi Indonesia and the national referral hospital in eastern Indonesia with the largest NICU facility in the region.

B. Data Collection

Data collection took place since the LBW hospitalize in NICU after the provision of an explanation of the study objective, process, confidentiality and the mothers right to withdraw at any time before seeking written consent. We collected demographic data of mothers and infants prior to the data collection. Demographic data included mothers' characteristics (i.e. age, education level, occupation, and parity and mode of delivery), preterm infant characteristics (i.e. birth weight, the weight of discharge, gestational age, and length of hospital stay). We follow-up the KMC implementation at home after 2 weeks of hospital discharge including total days of KMC at home, frequency KMC each day, total hours in each KMC, Reason of discontinuing KMC. 49 mothers of LBW infant was recruited

C. Etichal Consideration

The study ethic was approved by institutional review board (IRB) which the admission number is 356/H4.8.4.5.31/PP36-KOMETIK/2017. All the data of this study were coded, and no name were given. All materials were only used for this study.

D. Data Analysis

Sociodemographic and medical variables were summarized to describe patients' characteristics. Absolute and relative frequencies were used to describe qualitative variables, and averages and Standard Deviations (SD) were used to describe quantitative variables. The objective criteria for discontinuing KMC implementation at home was the mothers did not implement KMC at home even one time. The bivariate analyses were based on the Chi-square test and statistical significance was determined by a p-value of <0.05.

III. RESULT

A total of 49 mothers of LBW infants were enrolled in this study. Most of the participants 67,3% (33 mothers) was in the range of age 20 – 35 years old. Education background of the mothers were dominated by high school which were around 44,9% (22 mothers). 63.3% (31 mothers) occupation of the participants in this study was an employee. Among these 49 participants, 57,1% (28 mothers) were multipara; 61,2% (30 mothers) participants were a caesarean type of delivery. For the LBW infant, the mean of infants gestational age was 33,94 weeks (±2,749), with a mean of birth weight of 1665,67 g (± 411,2) and the average of weight at discharge were 1885,35 g (± 391,1). The length of hospital stay was on average 21,67 days (± 10). The completed characteristic is described in Table I.

TABLE I. MOTHERS AND INFANTS CHARACTERISTIC (N=49)

Mothers Characteristic	N	%
Age (years)		
≤ 19	3	6,1
20 – 35	33	67,3
≥ 36	13	26,5
Education		
Less than high school	9	18,4
High school	22	44,9
Partial College (≥ 1 year)	1	2
University	17	34,7
Occupation		
Housewives	18	36,7
Employee	31	63,3
Parity		
Primipara	21	42,9
Multipara	28	57,1
Type of delivery		
Vaginal	19	38,8
Caesarean	30	61,2

Infants Characteristic	Minimum	Maximum	Mean ± SD
Gestation week	27	40	33,94 ± 2,749
Birth weight (gram)	900	2450	1665,67±411,2
Discharge weight (gram)	1000	2690	1885,35±391,1
Length of hospital stay (day)	6	57	21,67 ± 10,

Table II demonstrates a total of the mothers that continued KMC implementation at home after hospital discharge was 59,2% (29 mothers) and the description of KMC implementation at home is described in Table III. Table II also represented several significant factors that influenced a continuing KMC implementation at home were mother KMC skill competency before discharge (p <0.006 and OR 6.250), Infant discharge weight (p <0.001 and OR 8.914) and length of hospital stay (p <0.015 and OR 4.433). Table IV describes the reason to stop doing KMC until at day 14, thirteen (26,5%) babies were still on KMC while 36 (73,5%) had stopped. For those who had stopped, the reason given included baby uncomfortable and fussy 8 (16.33%), the baby weight enhanced 9 (18.37%), the baby health going well 2 (4.1),

busy 9 (18.37%), and never did KMC since at hospital 8 (16.33%).

TABLE II. INFLUENCING FACTOR OF CONTINUED KANGAROO MOTHER CARE (KMC) AT HOME (N=49)

		Continue of KMC (%)	Discontinue of KMC (%)	Statistic	
				P value	OR
Skill competency of KMC before discharge	Yes	25 (71,4)	10 (28,6)	0,006	6,250
	No	4 (28,6)	10 (71,4)		
Infant discharge weight (g)	≤ 2000	24 (77,4)	7 (22,6)	0,001	8,914
	> 2000	5 (27,8)	13 (72,2)		
Length of hospital stay (days)	≤ 20	19 (76,0)	6 (24,0)	0,015	4,433
	> 20	10 (41,7)	14 (58,3)		
Family support	Husband	8 (61,5)	5 (38,5)	0,840	1,143
	Husband & Family	21 (58,3)	15 (14,7)		

TABLE III. KMC IMPLEMENTATION AT HOME BY MOTHERS (N=29)

KMC Implementation	Minimum	Maximum	Mean
Total of days	1	14	9
KMC frequency in a day	1	4	1,7
KMC duration in each (hours)	0,5	4	2,03

TABLE IV. REASON TO STOP DOING KMC AT HOME IN 2 WEEKS FOLLOW-UP

Problem	Number	Percent
Still doing KMC at day 14	13	26,5
Didn't doing KMC until at day 14	36	73,5
Reason: Baby uncomfortable and fussy	8	16,33
The baby weight enhanced	9	18,37
The baby health going well	2	4,1
Busy	9	18,37
Never did KMC since at hospital	8	16,33

IV. DISCUSSION

This study aimed to describe of KMC implementation at home by mothers and to analysis a potential factor influencing of it. This study found that 14 days after hospital discharge there is 26,5% still do KMC at home and 73,5% (36 mothers) did not do KMC at home. Moreover, from 36 mothers who did not doing KMC on 14 days after discharge, there are 20 mothers did not implement KMC at home for the first day at home (never did at home). We further analyze found the medical factors including mother KMC skill competency before discharge, infant discharge weight and length of hospital stay. This study in line with others studies on a systematic review that represented that medical concern as factors that influenced on KMC implementation including mothers knowledge about KMC benefit [15]. Our study found that infant weight under 2000 g at hospital discharge influenced mothers' decision to implemented KMC at first day at home after hospital discharge. Others systematic review found different result which the infant condition such as very preterm infant, very low birth weight and unstable infant make mothers felt fear for potential adverse consequences are identified as barrier to implemented KMC since at hospital [15].

Our current study found family support not significant influence on mothers' decision to stop doing KMC at home on first-day hospital discharge. This study different with others study that gives KMC training in the hospital of their study describes the family as one of the mothers support that encourages the mother to practice KMC at home and in this study found that almost mothers of LBW infant still doing KMC on 45 days after hospital discharge [16]. In this study also found that there are 16,33% mothers stated that they never did KMC since at hospital, this result describes that KMC has not yet strictly implemented by a health care provider in a hospital. Another study describe that barrier of KMC implementation in hospital by care provider including lack of facility to implement KMC, lack of training health workers, lack of time/workload, and socio-cultural norms and practice [17]. KMC as one approach that have not prioritize by institutional leadership is identified as one of the barrier for enhancing health-care workers motivation to practice or teach it to the mothers of LBW infant [15].

WHO KMC guidelines describe that KMC is initiated in the hospital and continued at home under the supervision of health staff to establish the safety and suitability of domiciliary KMC for infants at home [11]. KMC implementation in this study has not followed all element in WHO guidelines, especially about continuum follow-up for KMC implementation at home because there is not yet policy about this follow-up. In other hands, KMC initiated since in hospital for LBW infant have not carried out strictly according to the result of this study that found one of reason to stop doing KMC at home was the mother never did KMC since at the hospital. There are several other reasons to stop doing KMC at home before 2 weeks and this study similar to other research in Nigeria that found the reason to stop doing KMC at home by the mother were baby refusing KMC position, mother felt it was Okay, baby had gained enough weight, mother felt uncomfortable sleeping at night and mother did not have help with domestic work [12].

There are several limitations in this study. Firstly, the study was undertaken in one location in Indonesia. However, this hospital was a national referral hospital in the eastern part of Indonesian and has the largest NICU facility in the region. Secondly, there is limited medical equipment and rooms in this NICU, so sometimes the baby directly hospital discharge from level 2 NICU and not transferred to level 1 or KMC room.

V. CONCLUSION

Mothers of LBW infant make decision to stop doing KMC at home influenced by mother KMC skill competency before discharge, Infant discharge weight and length of hospital stay. Almost of the mothers did not continue to do KMC at home until 14 days and the average of the mothers stop doing KMC on 9 days after hospital discharge. Their reason to stop KMC such as baby uncomfortable and fussy, the baby weight enhanced, the baby health going well, busy, and never did KMC since at hospital. Hence, the education, health care provider support and continue follow-up at home are

needed for enhanced the mother's responsibility and awareness to doing KMC at home.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

AUTHOR CONTRIBUTIONS

Suni Hariati had primary contribution to conceptualization and methodology of the study, carried out the investigation, data curation, visualization, and writing - original draft. Retno Sutomo, Lely Lusmilasari and Andi Dwi Bahagia Febriani were embroiled in conceptualization and methodology, visualization, review the manuscript.

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