Educational program for enhancing parental competency and outcomes of preterm infants

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Tujuan: Menilai efektivitas program edukasi terhadap kompetensi orang tua dan status kesehatan bayi kurang bulan di JABOTABEK, Indonesia.

Bahan dan cara kerja: Studi ini menggunakan rancangan *posttest only, time series*. Sebanyak 54 orang tua dan bayinya diambil secara purposif, dan dikelompokkan menjadi kelompok kontrol (n=27 pasang) dan kelompok perlakuan (n=27 pasang) dengan cara teknik menjodohkan berat badan lahir dan usia kehamilan bayi. Kelompok perlakuan mendapat program edukasi yang dikembangkan oleh peneliti berdasarkan teori pembelajaran sosial dari Bandura dan studi literatur. Kelompok kontrol mendapat asuhan konvensional.

Hasil: Para Ibu dan Bapak yang berpartisipasi dalam program edukasi memperlihatkan tingkat kompetensi yang lebih tinggi pada saat bayi keluar dari rumah sakit (RS), 2 minggu, dan 6 minggu setelah bayi keluar dari RS dibandingkan dengan kelompok kontrol dengan tingkat kemaknaan (p < .05). Bayi-bayi yang orang tuanya berpartisipasi dalam program edukasi mempunyai berat badan lebih tinggi pada 2 minggu dan 6 minggu setelah keluar dari RS dibandingkan dengan bayi-bayi dari kelompok kontrol. Walaupun demikian, perbedaan tersebut tidak bermakna. Bayi-bayi dari orang tua yang berpartisipasi dalam program edukasi mempunyai frekuensi kunjungan akut yang lebih rendah pada 2 minggu dan 6 minggu setelah bayi keluar dari RS dibandingkan dengan bayi-bayi dari kelompok kontrol, tetapi perbedaan ini tidak bermakna. Tidak ditemukan adanya rawat ulang pada bayi-bayi yang orang tuanya berpartisipasi dalam program edukasi dalam 2 minggu setelah bayi keluar dari RS. Sebagai perbandingan, 7,4% bayi pada kelompok kontrol mengalami rawat ulang pada periode ini. Perbedaan ini tidak bermakna.

Kesimpulan: Temuan ini mengindikasikan bahwa program edukasi dapat meningkatkan kompetensi orang tua dalam merawat bayi prematur. Terdapat kecenderungan peningkatan berat badan, penurunan kunjungan akut bayi, dan juga penurunan rawat ulang pada bayi.

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Kata kunci: bayi kurang bulan, program edukasi, kompetensi, rawat ulang.

Objective: To test the effectiveness of an educational program on parental competency and outcomes of preterm infants in JABOTABEK region, Indonesia.

Materid and methods: This study was a posttest only, time series design. Purposive sampling was used to recruit 54 parents and their infant who were assigned to a control group (n = 27 pairs) and an experimental group (n = 27 pairs) by matching infant's weight and gestational age. The experimental group received an educational program deve-loped by the researcher based on Bandura's Social Learning Theory and a review of the literature. The control group received only conventional care

Result: Mothers and fathers who participated in the educational program demonstrated higher level of competency at the time of the infant's hospital discharge, at 2 weeks, and at 6 weeks after the infant's discharge than those in the control group with a significant level of (p < .05). Infants of parents who participated in educational program had higher weight at 2 weeks and at 6 weeks after discharge than those in the control group. However, the differences were not significant. Infants of parents who participated in an educational program had fewer acute care visits at 2 weeks and at 6 weeks after discharge than those in the control group but, the differences were not significant. There were no hospital readmissions in infants of parents who participated in the educational program during the first 2 weeks after discharge. In comparison, 7.4% of control group infants had hospital readmissions during this period. This difference was not significant, however.

Conclusion: These findings indicated that educational program could enhance parental competency in caring for their preterm infants. There was the inclination to increase infant's weight, reduce infant's acute care visits, and also reduce infant's hospital readmissions.

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Keywords: preterm infants, educational program, competency, hospital readmission.

INTRODUCTION

The World Health Organization (WHO) noted that there are few child health programs that focus on neonatal health, including the health of preterm infants.[1] The infant mortality rate (IMR) in Indonesia remains high compared to other Association of South East Asian Nations (ASEAN) countries. In 2002, the IMR in Indonesia was 35 per 1000 live births[2] compared to 30 per 1000 births in the Phi-

lippines and 20 per 1000 births in Thailand.[3] In Indonesia, 39% of all infant deaths occurred between the ages of 0 to 28 days old, and 79% of neonatal deaths occurred early in the neonatal period.[4] In a study at Dr. Cipto Mangunkusumo Hospital in Jakarta, the mortality of very low birth weight (VLBW) infants was 63%, while the mortality of low birth weight (LBW) infants was 7%.[5] The main causes of the neonatal death in Indonesia are asphyxia, immaturity, hypothermia, and infection.[6,7] The main causes of early neonatal death (0 to 7 days) are prematurity and low birth weight (LBW) (35%), and neonatal asphyxia (33.6%). Infection (57%) and feeding problems (14%) are the primary causes of late neonatal death (8 to 28 days).[4] These statistics suggest the need for improvements in the care of newborns, especially those who are preterm.

Preterm infants are at an increased risk for health and developmental problems such as infection, cardiorespiratory problems, gastrointestinal problems, developmental delay, and feeding problems.[8,9,10] The incidence of hospital readmission of preterm infants ranges from 25% to 50% compared to 8% to 10% for term infants.[8] The primary reason for hospital readmissions are respiratory problems, gastroenteritis, infection and hernia repair.[11,12,13]

The birth of a preterm infant is often associated with parental feelings of anxiety and incompetence, and these parents often have limited confidence when caring for their infants compared to mothers of fullterm infants.[14,15] Parents of preterm infants need health care information in order to promote their child's health. Findings from a number of studies suggest that educational programs can increase parental knowledge and behavior, parental ability, mother-infant interaction, and mother-infant attachment.[14-16,17,18,19] Health education programs are more beneficial for parents if the information is based on their individual needs.[20]

Brazy, Anderson, Becker, and Becker[21] found that the information that parents most needed related to infant health, infant care, and coping skills. However, Drake[22] reported that the top two discharge teaching needs of parents of preterm infants were infant resuscitation and signs and symptoms of illness. Butts and colleagues found that the three most frequent reasons for parent-initiated telephone calls following hospital discharge related to questions about the infant's health condition, feeding problems, and respiratory problems.[23] In another study, researchers found that mothers who indicated that they needed more information but did not receive it reported more anxiety and less confidence.[24]

A preliminary needs assessment for the present study was conducted with 32 mothers of preterm infants who were hospitalized in a neonatal ward in Jakarta. The purpose of the study was to identify the information needs of preterm infants' mothers while the infant was in the hospital and after the infant's hospital discharge. The sample included mothers whose infants were the first preterm infant in the family, did not have congenital abnormalities, and were discharged from the hospital within 6 weeks. The researcher collected the data at the follow-up clinic or in the infants' homes within 40 days after the infant's hospital discharge. Mothers indicated that during the infant's hospitalization they needed information related to the infant's health condition, feeding, bathing and dressing, cord care, positioning, holding and handling, infant behaviors, responses of mothers to infants' behaviors, visiting policy, and a basic use of hospital equipment. Following hospital discharge, mothers needed information related to feeding, recognition and prevention of infection, waming sign of health problems, immunizations, and infant stimulation.

This study was conducted at two public hospitals in Jakarta: Dr. Cipto Mangunkusumo and Fatmawati Hospitals. Both hospitals provide special care for high risk infants. Neonatal nurses at the two study hospitals currently teach parents how to care for their infants, however, parents are given limited opportunities to care for their infants during visits due to hospital policy. A pilot study was conducted to understand what kind of information Indonesian parents received by nurses before being discharge from the hospital. The sample included 18 level II neonatal nurses at Dr. Cipto Mangunkusumo Hospital. The researcher used an open-ended question to ask nurses what type of information they provided to parents of preterm infants during the infants' hospital stay. The majority of nurses reported that they taught parents how to keep a baby warm, how to practice kangaroo care, how to feed the infant, and how to identify early signs of health concerns.

These findings indicated that there is a gap between information needs identified by Indonesian parents of preterm infants and the information typically provided by neonatal nurses. Therefore, this study was conducted to develop and evaluate an educational program for parents of preterm infants in Indonesia.

The objective of this study was to test the effect of an educational program on parental competency and outcomes of preterm infants in Indonesia. Specific outcome measures included infant weight gain, number of acute care visits, and number of

hospital readmissions during the first 6 weeks post hospital discharge.

MATERIAL AND METHOD

Design and Sample

A posttest-only, time series design was used. The population included mothers and fathers of preterm infants whose child was admitted to the neonatal ward at either Dr. Cipto Mangunkusumo Hospital or Fatmawati Hospital in Jakarta. Participants were selected by purposive sampling method and met the following criteria: (a) minimum age of 20 years, (b) able to read and write in Indonesian, (c) live in Jakarta, Bogor, Tangerang, or Bekasi (JABOTA-BEK), and (d) willing to participate in the study. The infants met the following criteria: (a) birth weight between 1500 - 2449 grams, (b) gestational age between 32 - 36 weeks, (c) did not have congenital abnormalities, (d) were singletons, and (e) were the first preterm infant in the family.

Using a formula of sample size for two means,[25] the minimal sample size was 54 to achieve a power of 80. In order to anticipate the loss of subjects in this study, the sample size was planned for 60. Thirty pairs of parents were placed in the control group and 30 in the experimental group. A matching technique was used to assign participants to the experimental or control group to minimize group differences.[26] Infants in both groups were matched based on the infant's characteristics: birth weight and gestational age.

During data collection, 35 infants in the control group and 34 infants in the experimental group met the inclusion criteria. In the control group, one infant was readmitted to the hospital but died, after previously being at home for 10 days with an infection. Also, one infant in the control group and four infants in the experimental group did not receive follow up assessment due to an unclear or unknown addresses. Therefore, there were only 63 infants: 33 infants in the control group and 30 infants in the experimental group. In the control group, 27 of the 33 infants matched with the experimental group giving a sample size of 54 and therefore meeting the required minimal sample size (54).

Instruments

A Demographic Data Form (DDF) was developed by the researcher to collect data on demographic characteristics such as parental level of education, ethnicity, marital status, occupation, number of children at home, ages of children, and source of family support, and infant gestational age, birth weight, weight at discharge, gender, and the number of days in NICU and/or neonatal ward.

The Parental Competency Scale (PCS) was modified by the researcher from the Maternal Competence[27] and the Maternal Confidence Scale[28] to measure parental competency. The instrument was originally developed to be used as a self-report instrument but it was modified for use as an observational measure. Parental caregiving activities were observed and rated. The observation ranged from 30 to 45 minutes. Permission was granted to use and modify these instruments. These modified instruments were observational to identify direct parental caregiving skills. The revised scale included 12 items for the Paternal Competency Scale (PCS) and 16 items for the Maternal Competency Scale (MCS). Each was rated on a 4-point Likert-scale from 1 = not at all, to 4 = completely. The scales covered four of the five domains of parental competencies: being with the baby (4 items); knowing the baby as a person (1 item); giving care to the baby (MCS = 7 items, PCS = 3 items); and problem solving infant care issues (2 items). The PCS was the same as the MCS without four caregiving items: bathing, feeding, burping, and paying attention during feeding. There was a possible range of scores from 12 to 48 for the PCS, and 16 to 64 for the MCS. A higher score indicated greater competency.

The Infant Outcome Scale was developed by the researcher to record infant weight, frequency of acute care visits, reasons for acute care visits, frequency of hospital readmissions, and reasons for hospital readmissions at 2 weeks and at 6 weeks after hospital discharge. The infant's outcome was measured during home visits by collecting data on the infant's weight, numbers of acute care visits, and hospital readmission. Data collectors used the same scale, which was calibrated before each use. Data related to the acute care visits, and hospital readmissions were obtained from parents' reports.

Content validity of the scales was established by submitting the scales to seven experts: six nurses lecturer in the Maternal and Pediatric Nursing Department, Chiang Mai University and the University of Indonesia, and one pediatric consultant. The content validity of the Infant Outcome Scale was calculated together with the Demographic Data Form (DDF). The content validity of the DDF ranged from .93 to 1.00 with an overall index of .997. The content validity of the Maternal Competency Scale ranged from .86 to 1.00 with an overall

index of .977, and the Paternal Competency Scale ranged from .86 to 1.00 with an overall index of .97.

The interrater reliability of the MCS and PCS were assessed by two nurses in the hospital who observed and rated 10 parents' activities related to the parental competency. The activities included talking to the baby, showing pleasure at being with the baby, expressing appreciation of the baby characteristics, touching or handling, holding, feeding, burping, paying attention while feeding, bathing, changing the baby clothes and diapers, recognizing and solving the problem, and expressing satisfaction in being the baby's parent. To ensure consistency of the observations, a guideline of scoring was provided by the researcher. Using the Product Moment Correlation test[29] at an alpha level of .05, the correlations between the two raters were .793 for the MCS and .638 for the PCS.

Data Collection Procedure

The researcher worked with the hospital staff to identify eligible participants for the study through a medical record search. After informed consent was obtained, a structured interview was carried out at the maternity ward and at the neonatal ward, to obtain demographic data. Data related to the infants' characteristics were collected from the infant's medical record. Infant weight measurement and parental competency were assessed at the time of the infant's hospital discharge, and during home visits at 2 weeks, and at 6 weeks after discharge. Data collectors visited parents around bathing time, therefore caregiving activities could be observed. The observation ranged from 30 to 45 minutes. Data related to the acute care visits, and hospital readmissions were obtained from parents' reports. Initially, data were collected from the control group. After 35 subjects in the control group were recruited, data were collected for the experimental group.

The experimental group parents received a 4-part educational program that included four components: (a) sharing their birth experience; (b) teaching characteristics of premature infants, their needs, and how to meet them; and (c) showing a video about premature infant care, and practical session with guidance from the intervener. The video was in English with a duration of 30 minutes. The content of video was summarized in Indonesian to provide parents with a better understanding of the content. Parents could ask questions or clarify information. The program was developed by the researcher based

on Social Learning Theory and a review of the literature. The intervention program was provided by two hospital nurses and the researcher. To ensure the consistency between interventions, an intervention protocol was developed. It consisted of the intervener activities, duration, timing, place of intervention, and comments from the intervener.

Twenty mothers (74.1%) and 11 fathers (40.7%) of the 27 couples attended all parts of the educational program, and seven of 27 mothers (25.9%) and 12 of 27 fathers (44.4%) attended Parts I-III of the program. Four of the 27 fathers (14.8%) attended only one part of the program. Fathers who did not attend the entire program were due to work commitments, or unknown reasons. The first 3-part of the program was conducted in one session, and the last part (Part IV) was in another session. Some parents preferred to attend both sessions in one day, but some of them did not.

Part I ranged from 10 to 15 minutes. The second part ranged from 10 to 25 minutes, the third ranged from 25 to 45 minutes, and the fourth part of the program ranged from 45 to 60 minutes. The average time of the educational program was 102 minutes, ranging from 90 to 145 minutes for the whole program, and 50 to 95 minutes for the sharing of experiences and teaching about the content of the booklet. The majority of the program was conducted in 2 days, the second and the third days of the post partum period.

Infants in the control group received conventional care from the neonatal ward staff, including general infant care, nutrition, and laboratory investigation. Information about infant's health condition, feeding, and visiting policy were also given to parents. Mothers also received conventional care from the maternity ward staff including instruction about breast care, breastfeeding, and maternal nutrition, however they did not participate in the educational program.

Data Analysis

Demographic data were analyzed using descriptive statistics for frequency, mean, and standard deviation. A t-test and a repeated measures MANOVA were used to determine the effects of the program on parental competency and infant weight. A chi square-test was used to analyze the effect of the educational program on acute care visits and hospital readmissions after the infant's hospital discharge. The level of significance for rejection of the null hypotheses was .05.

RESULT

Table 1 includes information on the demographic characteristics of mothers, fathers, and infants in the experimental and control groups. The results indicate that there were no significant differences between the experimental and control groups on any parent or infant variable.

Table 1. Comparison of Mothers', Fathers', and Infants' Characteristics Between the Experimental and Control Groups

Variables	Experimental Group n = 27 Value	Control Group n = 27 Value	p (2-tailed)
Age ($\overline{X} \pm SD$)			
Mother	27.66 ± 5.55	28.11 ± 6.58	.780
Father	30.33 ± 7.49	32.33 ± 6.50	.300
Education			
Mother	10.78 ± 2.67	9.33 ± 3.69	.780
Father	11.11 ± 3.02	10.89 ± 2.81	.105
Total family income (rupiah) ($\overline{X} \pm SD$)	851.851 ± 511.498	$1.007.407 \pm 757.488$	.381
Marital status (n, %)			
Married	27 (100)	27 (100)	
Divorce	–	–	
Ethnicity (n, %)			
Mother:			
Javanese	10 (37.04)	11 (40.74)	
Sundanese	6 (22.22)	7 (25.93)	
Betawi	8 (29.63)	6 (22.22)	
Palembang	2 (7.41)	1 (3.70)	
Lampung	1 (3.70)		
Others (Padang, Bugis)		2 (7.41)	
Father:			
Javanese	12 (44.44)	7 (25.93)	
Sundanese	7 (25.92)	7 (25.93)	
Betawi	8 (29.64)	7 (25.93)	
Palembang		2 (7.41)	
Others (Padang, Flores, Makasar, Manado)		4 (14.80)	
Infant gender (n, %)			
Boy	15 (55.56)	12 (44.44)	
Girl	12 (44.44)	15 (55.56)	
Birth weight ($\overline{X} \pm SD$)	1950.00 ± 254.25	1857.40 ± 294.39	.222
Gestational age ($\overline{X} \pm SD$)	34.44 ± 1.40	34.37 ± 1.24	.838

T-tests were calculated to compare competency scores of mothers and fathers in the experimental and control groups (see Table 2). The findings in Table 2 indicate that there were significant differences in mothers' competency scores between the experimental and control groups at the time of the infant's discharge (TI), at 2 weeks (T2), and at 6 weeks following discharge (T3). There were also significant differences in the fathers' competency scores between the experimental and the control groups at T1, at T2, and at T3.

Table 2. Result of t-tests Comparing Competency Scores of Mothers and Fathers in the Experimental and Control Groups

Variable	Group	n	Mean (SD)	t	p (2-tailed)
Mother score at T1	experimental	27	45.44 (6.96)	3.11	.003
	control	27	40.25 (5.15)		
Father score at T1	experimental	26	28.23 (6.67)	2.02	.048
	control	25	24.36 (6.98)		
Mother score at T2	experimental	27	52.15 (4.62)	2.37	.021
	control	27	49.26 (4.32)		
Father score at T2	experimental	25	36.36 (6.47)	2.33	.024
	control	22	31.77 (7.03)		
Mother score at T3	experimental	26	58.81 (3.78)	5.47	.000
	control	26	52.54 (4.46)		
Father score at T3	experimental	23	40.87 (4.21)	4.06	.000
	control	24	35.08 (5.44)		

(p < .05)

At the time of discharge, infants in the control group had a mean body weight higher than infants in the experimental group. At 2 weeks and at 6 weeks, infants in the experimental group had higher mean body weight compared to infants in the control group, although these differences were not significant (see Table 3). However there were significant differences in infants' weight gain between the experimental and control groups at T3 - T1 and at T3 - T2 at an alpha level of .05 (see Table 4).

Table 3. Result of t-tests Comparing Infants Body Weight Between the Experimental and Control Groups at T1, at T2, and at T3

Variable	Group	n	Mean (SD)	t	p (2-tailed)
Infant weight at T1	experimental	27	1955.55 (263.97)	-1.15	.255
	control	27	2048.15 (323.95)		
Infant weight at T2	experimental	27	2303.70 (258.67)	.13	.901
	control	27	2292.59 (380.71)		
Infant weight at T3	experimental	26	3432.69 (413.99)	1.52	.134
	control	26	3226.92 (550.31)		

Table 4. Result of t-tests Comparing Weight Gain in Infants in the Experimental and Control Groups

Variable	Group	n	Mean (SD)	t	p (2-tailed)
Weight gain T2 - TI	experimental	27	348.15 (252.86)	1.77	.082
	control	27	244.44 (168.23)		
Weight gain T3 - TI	experimental	26	1467.31 (316.88)	2.60	.028
	control	26	1176.92 (307.32)		
Weight gain T3 - T2	experimental	26	1119.23 (385.99)	2.27	.012
	control	26	923.08 (419.02)		

(p < .05)

To understand the infants' weight gain pattern, a repeated measures MANOVA test was carried out. As predicted, infants' weight significantly increased between T2 and T3. In addition, there was an interaction between infant weight and time of measurement ($p < .045$) (see Figure 1).
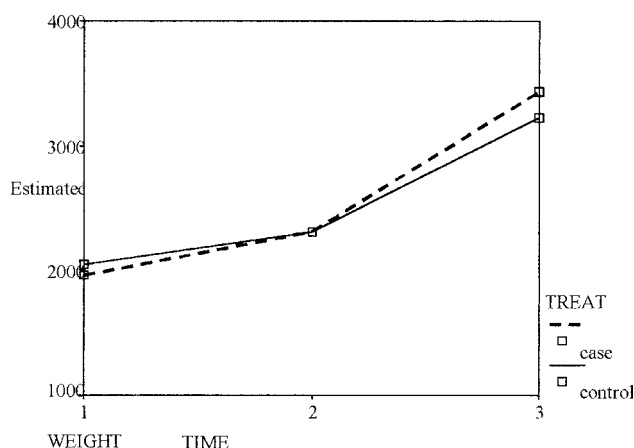

Figure 1. The Weight Gain Pattern

Figure 1 indicates that at the time of discharge, infants in the control group had higher body weight than infants in the experimental group. However, at Time 3, the mean body weight of infants in the experimental group was higher than the mean weight of infants in the control group.

Table 5 illustrates findings from chi-square tests comparing the number of acute care visits between the experimental and control groups. The data in Table 5 indicate that the frequency of acute care visits of infants in the control group were higher compared to infants in the experimental group, although this difference was not statistically significant. One infant in the control group visited the clinic twice within 2 weeks and 6 weeks period.

Table 5. Result of Chi-Square Tests Comparing Acute Care Visits Between the Experimental and Control Groups

Variable		Experimental n (%)	Control n (%)	Fisher's Exact Test (1-sided)
Acute care visits at T2	Yes: 1 time	2 (7.41)	5 (18.52)	.210
	2 times	–	–	
	No	25 (92.59)	22 (81.58)	
Acute care visits at T3	Yes: 1 time	3 (11.54)	4 (15.38)	.245
	2 times	–	1 (3.85)	
	No	23 (88.56)	21 (80.77)	

(p < .05)

Two of 27 infants in the control group (7.4%) were readmitted to the hospital within 2 weeks of the infant's discharge. No cases of hospital read-missions were reported in the experimental group. There were no cases of hospital readmissions within 6 weeks after the infant's discharge in both groups, therefore it was not possible to analyze this difference statistically. Table 6 shows the result of chi-square tests comparing hospital readmissions between the experimental and control groups.

Table 6. Result of Chi-Square Tests Comparing Hospital Read-missions Between the Experimental and Control Groups

Variable		Experimental		Control		Fisher's Exact Test (1-sided)
		Freq	%	Freq	%	
Hospital re-admissions at T2	Yes	–	–	2	7.41	.245
	No	27	100	25	92.59	
Hospital re-admissions at T3	Yes	–	–	–	–	–
	No	26	100	26	100	

$(p < .05)$

There was no significant difference in acute care visits between the experimental and control groups at 2 weeks after the infant's discharge. The main reasons for infant acute care visits in the control group were cough and cold, fever, and mouth thrush. In the experimental group, mouth thrush was the cause for acute care visit. There were two cases of milk aspiration and two cases of diarrhea in the control group. There were no hospital readmissions in the experimental group.

DISCUSSION

The findings suggest that providing parents with information about infant care and allowing them to practice their skills before the infant's discharge could increase their competency. This finding is consistent with results from other studies. For example, Rutledge and Pridham[31] reported that a maternal preparation program resulted in increased maternal competence in infant care and infant. There were no statistical differences in infant body weight at 2 weeks and at 6 weeks after the infant's discharge (see Table 3). This may be related to the infant's weight at the time of discharge. Infants in the control group had higher body weight at time of discharge, although this difference was not significant. Infants in the experimental group had higher body weight at 2 weeks and at 6 weeks after the infant's discharge. There were significant differences in infant's weight gain between the experimental and control groups between 2 weeks and 6

weeks, and at 6 weeks after discharge. At 2 weeks, the mean infant weight in the experimental group increased 348 grams, compared to 244 grams for control group infants (Table 4). According to Chesnut,[32] premature infants generally gain about 300 to 400 grams per week during the first 2 months of life. Thus, the infants in the experimental group weight gain had normal weight gain, whereas infants in the control group had low weight gain. Infants in the experimental group increased their weight by 1119 grams compared to 923 grams for infants in the control group between 2 weeks and 6 weeks after discharge. This finding suggests a need for additional interventions to promote optimal weight gain during the first 6 weeks after discharge of preterm infants from the hospital.

Preterm infants in this study experienced several health problems after the infant's discharge. Cough, cold, and fever were the most common health problems in both groups, congruent with findings from previous studies.[32,33] Some of the mothers in this study did not take their ill infants to a health care facility due to financial concerns, or because they viewed coughs and colds as common problems in children that could be relieved by giving proper nutrition. This finding is consistent with findings of Notosiswoyo, Martomijoyo, Supardi, and Riyadina[34] who found that the majority of mothers (63%) whose infants or children suffered from common cold or acute respiratory infection solved the problems by self medicating their child.

Despite the limitations, the findings of this study provide important information for nursing practice and nursing research. The findings indicate that educational programs can increase parental competency and reduce the frequency of acute care visits as well as hospital readmissions. The finding that many of the infants continued to have problems at home suggests the need for longer-term follow up programs to provide information to parents about preterm infants' health conditions and their growth and development.

The findings of this study have implications for further research. Studies evaluating both hospital and home-based educational interventions in Indonesia are needed, using longitudinal designs that extend beyond the first six weeks of life. Future studies should include larger samples, and should utilize experimental designs. There is also a need to identify measures of parental competency and knowledge that are culturally appropriate for an Indonesian sample and that have established reliability and validity. In a similar study using a video in Indonesian, asking parents to observe nurses caring for their infant in a certain time, and providing an intervention program in the hospital and at home will help parents to receive all parts of the educational program and increase its outcome. A longitudinal study to identify the effect of an educational program on infant outcomes is needed.

CONCLUSION

The primary limitations of this study were the small sample size and the use of purposive sampling. This procedure tends to produce potential bias, therefore generalization of the findings was limited. Another limitation was the use of matching rather than random assignment to experimental or control groups, and the use of a posttest only design. This design weaker than the pre- and posttest design. However, it was not possible to measure parental competency and infant outcomes prior to the intervention. Another limitation is that some parents may not have had a full understanding of the information presented in the videotape, since the videotape was in English. In addition, not all mothers and fathers attended the entire program due to several reasons. A final limitation is that limiting assessment of infant outcomes to the first 6 weeks after hospital discharge may have precluded identification of longer-term outcomes.

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