

RESEARCH ARTICLE

Effect of health education on mother's knowledge to the length of hospital stay of children with pneumonia in Jakarta

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Abstract

Purpose: Pneumonia is the most common reason for parents to send their children for hospitalization. Currently, parents still lack knowledge on the proper management of sick children during hospitalization. It causes longer stay of children with pneumonia. This study aimed to identify the effects of giving health education through video and leaflet on mother's knowledge and their children's length of stay in three general hospitals in Jakarta region.

Methods: This study was a quasi-experimental study with pretest and posttest nonequivalent control group design. Health education was given to 64 mothers, 32 of them received it through video, while the other 32 received it through a leaflet. All respondents received health education in three days since their children were admitted. Data was collected through a self-reported questionnaire. Wilcoxon, Mann-Whitney, and t-Test were used for data analysis.

Result: This study showed mother's knowledge increased in both groups, however, the median difference of pretest-posttest on video group was higher than the leaflet one. Median difference value in video group was 8, and for leaflet group was 6 ($p < .001$). Children's length of stay in the video group was shorter than those in the leaflet group ($p < .001$).

Conclusions: Health education through video has a higher impact on increasing mother's knowledge and decreasing children's length of stay as compared through the use of leaflets.

Keywords: children, health education, length of stay, mother's knowledge, pneumonia

Introduction

Africa and Southeast Asia contributed to 80% of the global mortality in children under the age of five years (WHO, 2017). In Indonesia, 21.7% of the mortality in children under five years of age is caused by pneumonia (BPPK, Ministry of Health, 2013). The rate of mortality caused by pneumonia in Indonesia increased to 0.12% in 2017. Likewise in that year, DKI Jakarta has reported 43,451 children who suffered pneumonia, with a 4.14% mortality rate (DKI Jakarta Provincial Health Office, 2018). The Ministry of Health, RI (2009) explained that 15-30% of children with pneumonia required hospitalization. Most hospitalized children were aged 1-4 years (Morris, Winfield, & Young, 2012).

During hospitalization, children were highly dependent on their parents (Nurhaeni, Sutadi, Rustina, & Supriyatno, 2011). Many negative impacts could occur to parents of hospitalized children.

Physical and emotional stresses are examples of negative impacts that can be experienced by children and their parents. The family's function would also be disrupted (i.e. managing time for work) (Nakamura et al., 2014). Calzada et al. (2007) explained that the average mean length of stay of patients with pneumonia was 5-8 days. Meanwhile, the study of Zhang et al. (2017) reported 180,091 cases of hospitalized children in Shouzu, China from October 2005 to September 2011. In that number, 38.8% of the hospitalized children had pneumonia with influenza, and their mean average length of stay was 7.1 days. Nurhaeni, Rustina, Agustini, and Rosuliana (2018) found that the families that received health education indicated shorter lengths of stays as compared to families that did not receive an education. Education could be given using various types of media. Ahmet, Gamze, Rustem, and Sezen (2018) stated that health education using

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video is effective in improving knowledge as compared to the conventional way. This study aimed at identifying the effectiveness of pneumonia education using both video and leaflet methods to reduce the length of stay and the risk of re-hospitalization by improving the mothers' knowledge.

In the era of technology, all mothers have smartphones. Hence, the implementation of health education with the use of audiovisuals can be room for innovation. Similarly, all head nurses stated that health education using video can be developed. Indonesia is one of the countries that use a matrilineal system. This condition showed that the mother carries most of the responsibilities in taking care of their children including providing the children's needs and caring for them during their hospitalizations. This study aims to identify the effects of health education using video and leaflets on mother's knowledge and their children's length of stay in hospital.

Methods

Study Design

This study employed quasi-experimental with pretest and posttest nonequivalent control group design. This design was used to evaluate the effects of the kind of media used in giving health education on the mother's knowledge before and after the intervention.

Study Setting

Data were collected in four inpatient rooms for children in three general hospitals of the Jakarta region for three months (March-June 2019). All hospitals have B (good) national accreditation. The wards were semi-private (one room has four patients).

Sample

The sample included 64 respondents (mothers of children under five years old who have pneumonia). The sample was divided into two groups, 32 were assigned to the leaflet group, and the remaining to the video group. Calculation of sample size was performed using comparative numeric test formula for two groups. The formula for the sample size is

$$s^2 = \frac{s_1^2 (n_1 - 1) + s_2^2 (n_2 - 1)}{n_1 + n_2 - 2},$$

$$n_1 = n_2 = 2 \left(\frac{[Z\alpha + Z\beta]s}{x_1 - x_2} \right)^2; s_1 = 3.05; s_2 = 4.67$$

(Dahlan, 2016). The standard deviations (SD) were set at 32.10 $Z\alpha$ (4.66 as x_1) in group 1, and 28.55 as $Z\beta$ (3.05 as x_2) in group 2. The n_1 and n_2 was set at 20 participants (Arneliwati, Agrina, & Dewi, 2019). The results showed that a minimum of 58 respondents was required. To anticipate possible withdrawals, 64 respondents (10% of 58) were required in the study.

Samples were selected by using consecutive random sampling. The sample was chosen by the researcher based on the inclusion and exclusion criteria. The inclusion criteria were: (1) Mothers whose children were admitted and hospitalized due to pneumonia since the first day in a month or 30 days; (2) wherein, the child's diagnosis must not have severe complications (e.g. congenital heart defect, malnutrition, neurological disorders, pleural effusion, and all classification of special needs children); (3) who is willing to be the respondents of this study and signed the consent form; (4) who can read, write, and speak proper Indonesian; and (5) who have a mobile phone to access the video. The exclusion criteria were: (1) Mothers who decided to discharge a child of her own volition before the child fully recovered or discharge the child on the second day of hospitalization; (2) whose children died during hospitalization; (3) whose children had a deteriorating condition (had respiratory failure) during hospitalization and required intensive care; and (4) whose children were referred to another hospital. After the selection of participants, the mother completed the informed consent form before data collection using questionnaires was conducted.

Data Collection and Instrument Assessment

In this study, health education using either the video or leaflet methods was conducted in three days, starting from the first day of admission. Before the health education, all respondents filled out the pre-test questionnaire for pre-health education assessment. A respondent during three days in hospital was given health education twice per day. The duration of one health education session lasted a minimum of 10 minutes. On the last day, the respondents were asked to fill out posttest questionnaires without looking at the education media as a post-health education assessment. The video, as an instrument of health education, was valid and reliable. Validity and reliability tests were conducted with 30 mothers who had experience taking care of children with pneumonia in one general hospital in February 2019. The questionnaires adapted from Nurhaeni et al. (2018) were considered valid and reliable ($p > 0.6$), and the post-trial video of 5 minutes and 43 seconds had been approved by two pediatric nursing experts.

Data Analysis

Data analysis was performed using univariate, bivariate, and multivariate analysis software and processed. Univariate showed characteristics of respondents in three parts: (a) part one was mother's characteristics (age, education, occupation, knowledge before health education), (b) part two was children's characteristic (age, sex), and (3) the last part was environmental characteristics (occupant density and neighborhood density). Bivariate Wilcoxon, Mann-Whitney, and Pooled t-Test depended on the data.

Table 1. Distribution of respondent according to mother, children, and environmental characteristics

Variable	Group		P
	Video (n=32)	Leaflet (n=32)	
Mother's Characteristics			
Age in year (Mean; SD)	30.09; 6.664	30.66; 6.714	0.963 ^a
Education (f; %)			
Higher	9; 28.1	8; 25	0.843 ^b
Secondary	16; 50	15; 46.9	
Primary	7; 21.9	9; 28.1	
Job (f; %)			
Unemployed	21; 65.6	26; 81.2	0.258 ^b
Employed	11; 34.4	6; 18.8	
Knowledge before health education (Median; Min-Max)	14; 10-20	13.50; 8-21	0.655 ^a
Children's Characteristics			
Age in month (Mean; SD)	27.59; 14.979	26.63; 14.812	0.941 ^a
Sex (f; %)			
Male	18; 56.2	16; 50	0.802 ^b
Female	14; 43.8	16; 50	
Environmental Characteristics			
Occupancy density (f; %)			
Rare	17; 53.1	15; 46.9	0.803 ^b
Dense	15; 46.9	17; 53.1	
Neighborhood density (f; %)			
Rare	24; 75	21; 65.6	0.584 ^b
Dense	8; 25	11; 34.4	

^aindependent t test and ^bChi-Square, homogeneous $\alpha > 0.05$

Ethics

It has acquired a research permit from PTSP and Ministry of Health Special Region of Jakarta (Ref. No.: 095/AF.1/31/-1.862.9/2019 and No.: 4.237/-1.779.3). This study had received ethical approval from the Nursing Faculty Universitas Indonesia (Ref. No.: 23/UN2.F12.D/HKP.02.04/ 2019) and the Medical and Health Research Ethics Committee of the three general hospitals.

Result

The analyzed respondents' characteristics included mothers' age, education, job, knowledge before health education, children's age and sex, and environmental factors (occupancy and neighborhood density). Both intervention groups (video and leaflet group) had homogeneous characteristics with $p > 0.05$ on all variables. This means that the changes in the mother's knowledge after health education and length of stay of children were caused by the study's interventions. The youngest mothers were 17 years old in both groups. The mean age of children in both groups was 2 years old. Most of the mothers were

unemployed. More than half of them were living in a less dense neighborhood (see Table 1).

Table 2 showed that the median of mother's knowledge in the video group increased by 8 points (14 to 22) after providing health education using video media. Mother's knowledge in the control group increased from 13.50 to 19 after obtaining education with the leaflet. The Wilcoxon test was used to examine the significant difference between the two groups on the pretest and posttest scores of mother's knowledge. Its results showed $p = 0.001$.

Table 2. Mother's knowledge before and after health education

	Group		Mean Rank	P
	Video (n=32)	Leaflet (n=32)		
Mother's knowledge before health education (Median±Min-Max)	14±10-20	13.50±8-21	16.50	0.001*
Mother's knowledge after health education (Median±Min-Max)	22±14-24	19±12-24	16.50	0.001*

*Wilcoxon, significant < 0.05

Table 3. Difference of mother's knowledge and length of stay of children

	Group		P
	Video (n=32)	Leaflet (n=32)	
Difference of Posttest-Pretest (Median±Min-Max)	8±2-11	6±1-10	0.001 ^a
Difference of length of stay (Mean±SD)	3.91±0.818	5.28±0.924	0.001 ^b

^aMann-Whitney, ^bPooled t Test *significant $\alpha < 0.05$

Table 3 showed that the median scores of before and after mother's knowledge between the two groups have significant differences ($p=0.001$). The video group has more increased scores than the leaflet group after the intervention (8 on video group and 6 on leaflet group), which means that health education using the video is more effective than the leaflet to increase the mother's knowledge.

The pooled t-test was used to examine the differences in the length of stay (LOS) of children with pneumonia. The mean LOS on the video group is shorter than the leaflet group (3.91 than 5.28). In comparing the groups, results showed a statistically significant difference in the children's length of stay before and after the intervention with a p-value of 0.001. This meant that mothers who received health education using the video had a more decreased length of stay of children with pneumonia than those who were educated using the leaflet.

Discussion

This study used health education as an effort to improve mother's knowledge by adopting the theory of the Health Promotion Model as the rationale. Pender explained that three components were needed to be considered in conducting health education studies, namely: (1) individual characteristics and experiences, (2) behavior-specific cognitions and affects, and (3) behavioral outcome-health promoting behaviors (Alligood, 2014). The characteristics of this study included respondents that owned a smartphone. Based on the preliminary study in February of three general hospitals, four heads of children's room divisions stated that video-based health education had never been conducted in the hospital. During the process of this study, mothers stated that they were less confident in performing the treatment. After watching the video, mothers became more active and were supported by their families in taking care of their children. It meant that the three-day education had made mothers' knowledge better. Even though both groups showed increased knowledge after the interventions, the median was 13.5-14 on both pretests and increased to 22 in the video group and 19 in the leaflet group (see Table 2). The result indicated a significant difference between the video and leaflet groups ($p < 0.05$). The

median value of the video group was higher than the leaflet group, which means that health education using the video has more significant effects on improving the mother's knowledge than using the leaflet (see Table 3).

Such findings were in line with the Cone of Experience theory by Edgar Dale which stated that memory was determined by the learning method if learning was only involving one of the senses (e.g. seeing or hearing). According to the theory, someone could only remember 10-30% from the materials he or she learned. It is different from those who learn using two senses (i.e. seeing and hearing). In this case, the ability to remember would reach 50% (Davis & Summers, 2015; Sivakamasundari & Devaki, 2016). The leaflet method could only be read (i.e. involving one sense), while the video method involved two senses because it could be seen and heard. Thus, it made the ability to remember in the video group better than the ability in the leaflet group. The higher ability to remember would increase the level of knowledge. The Cone of Experience theory had been proven by several researchers, including Ferdous et al. (2014) who conducted qualitative research with 30 respondents. Most of them (28 participants) stated that they better understand the information about pneumonia from television or video, even though only nine participants had sufficient knowledge related to pneumonia's signs and symptoms from television or video. Jones et al. (2014) stated that information would be well-received if it was presented in a video display, as it is complemented by pictures, photos, and sounds in accordance with the signs and symptoms that happen to children. Research conducted by Yuliani, Nurhaeni, and Waluyanti (2016) stated that discharge planning could improve mothers' abilities to take care of their children 7.5 times better than mothers who did not receive any intervention related to discharge planning ($p < 0.05$). One component of discharge planning is education.

Discharge planning is an important part of the nursing process. About 76% of nurses agreed that discharge planning should be started from the first day of hospitalization (Morris et al., 2012). Mothers need proper discharge planning because it could significantly reduce complications, and chances of recurrences, mortality, and morbidity in children with pneumonia (Shepperd et al., 2013). Discharge planning should involve the mothers, where they play an important role in nursing their sick children. Having sufficient knowledge related to pneumonia could be useful as a preventive action (Jena, 2014). It correlates with this research because health education began when the patient was admitted to the hospital.

The results of this study showed that the length of stay between groups was significantly different ($p > 0.05$). The length of stay in the video group (3.91 ± 0.818) was shorter than those in the leaflet group (5.28 ± 0.924) with regards to the mother's

knowledge (see Table 3). Proper knowledge could improve a mother's ability in taking care of her children. Maramis, Ismanto, and Babakal (2013) proved that the knowledge related to an Upper Respiratory Tract Infection (URTI) influenced the mothers' abilities in taking care of their children; the more sufficient the mothers' knowledge, the better their abilities in taking care of their children. It was also supported by Kapti, Rustina, and Widyatuti (2013) who stated that education using a video method was better than a leaflet method in improving mothers' knowledge and behaviors related to treatment for diarrhea in children. The average post-education knowledge in the video group was higher than that of the leaflet group ($82.31 > 71.53$). The average behavior scores in the intervention group were also better than that of the control group ($87.07 > 83.77$). The better quality of mothers' nursing care could reduce the length of stay. It was quite equal to the research of Nurhaeni et al. (2018) which proved that the LOS of the intervention group (who have health education) was shorter than the control group. The intervention group has a LOS of children with pneumonia at 4.64 ± 1.96 , while the control group has 5.29 ± 1.96 LOS.

This research showed improved mother's knowledge could reduce the LOS of their children. Casman & Nurhaeni (2019) explained that family involvement especially that of mothers, could reduce children's suffering and the length of stay. The result from the analysis of eight articles showed children's length of stay has depended on the abilities of the parents treating their children. This was also supported by Miani et al. (2014) who explained that planning and intervention in nursing services influenced the length of stay.

Conclusion

There was a significantly higher improvement of mother's knowledge after receiving health education through video than the leaflet. The three-day education, as a component of discharge planning, significantly influenced the mother's knowledge and reduced the children's length of stay. In conclusion, health education based on the video significantly improved the mothers' knowledge and shortened the length of stay of children with pneumonia. Thus, it is suggested that nurses should continuously give health education using audiovisual media to increase the mother's knowledge in their practice to prevent diseases.

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“Sit down before fact like a little child,
and be prepared to give up every preconceived notion,
follow humbly wherever and to whatever abyss
Nature leads or you shall learn nothing.”

— Thoomas Henry Huxley