

**Original article**

**The effects of educational program on child care knowledge and behaviors of mothers of children under five years with pneumonia**

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**Abstract**

**Objectives:** This study was aimed to evaluate the effects of the educational program on child care knowledge and behaviors of mothers of children aged under five years. **Materials and Methods:** The quasi-experimental, pretest-posttest design was used to examine the effects of educational program on child care knowledge and behaviors of mothers of children under five years old with pneumonia. Fifty mothers of children under five years hospitalized with pneumonia were purposively assigned following standard procedure into either experimental or control group. Mothers of the study group received educational program together with children's routine care, where as control group mothers just attended their children receiving treatment. Subsequently mothers' knowledge, evaluated through structured Knowledge Questionnaire and behavioral information, through Behavioral Checklist Form were evaluated. Data were expressed as number (percent) and mean (SD) as appropriate. Demographic characteristics were analyzed by using frequency, percentage, mean, and standard deviation. Independent t-test and paired t-test were used to calculate statistical difference between groups as applicable. **Results:** Findings revealed that, subjects of both groups are homogenous in terms of demographic characteristics, but significant difference was observed regarding their mean ( $\pm$ SD) knowledge ( $25.04 \pm 5.81$  vs  $34.64 \pm 3.86$ ,  $p < 0.001$ ) and behavior score ( $6.64 \pm 2.23$  vs  $17.68 \pm 1.89$ ;  $p < 0.001$ ) between control and study group respectively. **Conclusions:** It was concluded that educational program supported that nurses need to involve themselves through helpful method of the educational program to teach the mothers' knowledge about pneumonia and their behavior during caring their sick children. Such program could effectively increase both knowledge and behavior of mothers of children under five with pneumonia.

**Key words:** Pneumonia, knowledge and behavior, education program.

**Introduction**

Pneumonia occurs worldwide but fatal in developing countries<sup>1</sup>. In Bangladesh, about 25% of all childhood death occurs due to pneumonia<sup>2</sup>. Pneumonia causes frequent physician visits, consumption of antibiotics and over-the-counter drugs, parental work loss, and decreased quality of life. In addition, both patient and their families are suffering from this illness<sup>3</sup>. Some Bangladeshi mothers' perceived pneumonia incorrectly; it occurs due to cold air, wind, water, or foods. Some

mothers stated that 'evil spirit' and 'evil winds' are the causes of pneumonia. A study in Bangladesh revealed that 45% of mother living in rural community used homecare remedies; for example, massaging the child chest with mixture of warm oil and garlic or black cumin seed<sup>4</sup>. Some mothers believed that pneumonia was caused by evil influence and in this case the children were treated by spiritual healers; as a result allopathic treatment was delayed or avoided<sup>5</sup>. It seems important

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that mothers need to have right information about pneumonia, and how to take care of the child with the condition.

Educating mothers have found to be of paramount importance in child care during health and disease. Vu-T<sup>6</sup> suggested that giving more specific health education to the mothers regarding ARI (acute respiratory infection) could minimize preventable deaths in children. In another study by Vitolo et al<sup>7</sup> observed a positive impact of educational program for mothers regarding dietary advice in reducing respiratory symptoms in infants during the first year of life. Lye et al<sup>8</sup> in their study found that health education of mothers on childhood pneumonia and training of health staff on case management effectively reduced severe ARI.

ARI control is an important program in Bangladesh. However, accessing necessary treatment of child<sup>5</sup> and case management<sup>9</sup> are highly important in ARI control program. Its success depends on recognition of danger signs by primary caretaker and subsequent contact with health service if necessary. A study revealed that only 59.9% of primary caretakers could identify the danger signs to seek help and only 58.4% of parents sought help in presence of danger signs<sup>10</sup>. These findings indicate the necessity and importance of providing education to mothers as they are the main care provider in the family. The present study was undertaken to evaluate the extent of knowledge and behaviors of mothers of children under five years old with pneumonia after treatment and also to compare the effect of the educational program on child care knowledge and behaviors these mothers.

## **Material and methods**

### ***Operational definition***

Mothers' knowledge refers to the level of mothers' understanding about various aspects of pneumonia including definition,

causes, risk factors, and signs and symptoms, management and care, immunization and prevention of pneumonia. Mothers' knowledge questionnaire composes of 44 true-false questions. The correct answer was scored '1' and incorrect answer was scored '0'. The higher scores on the mothers' knowledge questionnaire, the higher was the level of knowledge.

Mothers' behaviors refer to mothers' behaviors for caring of children with pneumonia. These behaviors include counting respiratory rate, identifying chest retraction, measuring temperature, providing tepid sponging, cleaning nose or airway, and measuring medication. It was measured by the Behavioral Checklist Form. The checklist was used to observe six behaviors with 22 items. The behavior performed correctly was scored '1' and incorrectly was scored '0'. The higher total score indicated the higher level of behaviors.

Educational program refers to program provided for mothers' having children under five years with pneumonia. The program was developed by the researcher. The main contents include knowledge regarding pneumonia discussed earlier. A two hour session was conducted using lecture with flip chart, leaflet, and demonstration and return demonstration.

### ***Methods***

A total number of fifty mothers having their children admitted in a public hospital, in the Dhaka city, with pneumonia were included in the study. Calculated sample size for each group was twenty five taking the power of 0.80, with alpha of 0.05, and the effect size of 0.80. Ethical approval for the study was obtained from the Institutional Review Board, faculty of Nursing, Prince of Songkla University, Thailand and permission from the authority of the institute for conduction of the study. The instruments: Mothers' Knowledge

Questionnaire including demographic characteristics and Behavioral Checklist Form used for data collection were developed in English for this study. They were translated into Bengali by using back translation technique and were validated by three experts. The reliability ‘ $\alpha$ ’ of the Mothers’ Knowledge Questionnaire was 0.72 and interrater reliability for Behavioral Checklist Form 0.70.

using lecture with flip chart, leaflet, and demonstration and return demonstration. The control group mothers were those whose children received treatment for pneumonia. Data were expressed as number (percentage) and mean $\pm$ SD where appropriate. Data were managed computer based statistical software SPSS. Qualitative and quantitative statistical tools were used to calculate statistical difference between the groups as applicable.

Mothers in the study group attended to a two-hour session of educational program

**Table 1:** Demographic characteristics of mothers in control and study group

Characteristics	Control Group	Study Group	Statistics	p value
Mothers’ age (yrs) [mean $\pm$ SD]	22.56 $\pm$ 4.28	22.20 $\pm$ 3.29	0.33 <sup>a</sup>	0.74
Number of children [N (%)]			3.67 <sup>c</sup>	0.29
One	12 (48)	14 (56)		
Two	8 (32)	9 (36)		
Three and more	5 (20)	2 (8)		
Religion [N (%)]				<sup>b</sup> 1.00
Muslim	24 (96)	24 (96)		
Hindu	1 (4)	1 (4)		
Formal education [N (%)]			<sup>c</sup> 0.14	1.00
Primary	5 (20)	5 (20)		
Secondary	17 (68)	17 (68)		
Higher secondary or more	3 (12)	3 (12)		
Monthly income (Tk) [N (%)]			2.42 <sup>c</sup>	0.6
$\leq$ 5000	10 (40)	9 (36)		
5001-10000	11 (44)	12 (48)		
10001-15000	4 (16)	2 (8)		
>15000	0	2 (8)		
Experience of taking care [N (%)]			2.42 <sup>c</sup>	0.19
< 1 week	13 (52)	18 (72)		
1 - 2 weeks	8 (32)	3 (12)		
> 2 weeks	4 (16)	4 (16)		

Data were expressed as mean $\pm$ SD and number (percent) as mentioned in the variable column. Different superscript in the statistics column indicates types of statistical tools used.

<sup>a</sup> Student’s –‘t’;

<sup>b</sup> No statistics is computed because the variable religion is a constant;

<sup>c</sup> Fisher’s Exact Test;

<sup>d</sup> Pearson Chi Squared test.

## Results

Demographic data of the study subjects are shown in the table 1. Age (in yrs) (mean±SD) of the Control and Study group was comparable [22.56±4.28 and 22.20 respectively; p=NS]. All the fifty mothers are of house wife. The two groups did not show statistical significant difference

regarding number of children in the family, religion faith, formal education, experience of taking care of sic children and their monthly family income (Table 1). Most of the mothers had child care experience regarding pneumonia less than one week and none of them received any teaching on pneumonia before.

**Table 2:** Age, gender, duration of hospital stay and previous history of pneumonia of the children in the two groups

Characteristics	Control Group	Experimental	Statistics	P
Age of children (months) [mean±SD]	3.79±2.04	5.30±4.83	1.44 <sup>a</sup>	0.16
Gender [N (%)]				
Male	17 (68)	14 (56)	0.76/0.38 <sup>d</sup>	
Female	8 (32)	11 (44)		
Duration of hospital stay (days) [mean±SD]	3.08±1.63	2.88±1.51	0.45 <sup>d</sup>	0.6
Previous history of pneumonia [N (%)]			3.12 <sup>c</sup>	0.47
Never	19 (76)	20 (80)		
Once	5 (20)	2 (8)		
Twice	1 (4)	1 (4)		
> Twice	0	2 (8)		

Data were expressed as mean±SD and number (percent) as mentioned in the variable column. Different superscript in the statistics column indicates types of statistical tools used.

<sup>a</sup> Student's -'t'; <sup>c</sup> Fisher's Exact Test; <sup>d</sup> Pearson Chi Squared test

**Table 3:** Mothers' knowledge score in the two groups of study subjects

Groups	Pre -test	Post-test	t/p values
Control Group (n=25)	24.12±4.82	25.04±5.81	- 1.7/0.29
Study Group (n = 25)	26.40±5.89	34.64±3.86	-6.45/<0.001

Results were expressed as mean±SD. Paired Student's-'t' test was performed to calculate statistical difference between two groups.

**Table 4:** Mothers' knowledge and behavior scores of the two groups

Variables	Control Group (n = 25)	Study Group (n = 25)	t/p values
Mothers' knowledge			
Pre-test	24.12±4.82	26.40±5.89	-1.49 /0.14
Post-test	25.04±5.81	34.64±3.86	-6.88/<0.001
Mothers' behavior score	6.64±2.23	17.68±1.89	-18.88/<0.001

Results were expressed as mean±SD. Unpaired Student's-'t' test was performed to calculate statistical difference between two groups.

Mean ( $\pm$ SD) age (months) of the children was  $3.79 \pm 2.04$  and  $5.30 \pm 4.83$  in the control and study group respectively ( $p=ns$ ). No statistical significant difference was observed between two groups regarding the children's gender, hospital stay and previous history of pneumonia (Table 2).

Regarding educational and behavior there was significant difference after the educational session. Mothers' knowledge score in the control group did not show any statistical difference but in the study group the difference was significant ( $p<0.001$ ) (Table 3).

Between the two groups in the pre-test session no significant difference was observed. In the post-test session knowledge score was  $25.04 \pm 5.81$  and  $34.64 \pm 3.86$  in the control and study group respectively ( $p<0.001$ ) (Table 4). After the educational session mothers' childcare behavior score found to be significantly higher in the study group compared to the controls ( $6.64 \pm 2.23$  and  $17.68 \pm 1.89$  respective) ( $p<0.001$ ).

### **Discussion**

The findings of this study were congruent with other studies. Vu-T<sup>6</sup> earlier suggested that giving more specific health education to the mothers regarding ARI could minimize preventable deaths in children. Vitolo et al<sup>7</sup> also have shown a positive impact of education program on nutrition for mothers in reducing respiratory symptom in infants during the first year of life. Mantango and Neuvians<sup>12</sup>, found that village health workers training, providing treatment pneumonia with co-trimoxazole in the community, refer seriously ill children to the hospital and mothers health education could efficiently reduce under five child mortality rates from ARI. Lye et al<sup>8</sup> have shown that health education of mothers on childhood pneumonia and training of health staff on case

management effectively reduced severe ARI. However, these studies were not absolutely on education program. They had other strategies with education program to maximize the effects of intervention.

In this quasi- experimental study we assessed the demographic characteristics and pre-test knowledge scores of both groups to determine whether mothers in both groups were different. The findings of no significant difference in subjects' demographic characteristics and pre-test knowledge score helped ensure the internal validity of this study finding that mothers' knowledge in child care at post test of the study group was the effect of the educational program being offered.

The result of this study showed that after receiving education together with usual care the study group had a higher knowledge and behaviors score than that of the control group who's received only the medical care (Table 3). The change in child care knowledge and behavior score level believed to be the result of educational program session. There may be several explanations, however, most importantly:

Firstly, a significant knowledge gain in the study group might be due to use of educational materials including flipchart and leaflet. Flipcharts containing very attractive design and color, simple description, and meaningful related pictures found to be helpful to make people more understood. The flip chart had great benefits for a number of reasons; it is visually appealing, and easily understood. It could be used effectively by a range of facilitators and in multiple settings<sup>13</sup>. Moreover, distribution of leaflet containing the same information as in the flipcharts helped the mothers be able to review and share knowledge among peer and others, which in turn helped them retaining more information.

Secondly, in the study group, 72% of mothers had child care experience less than one week (Table 1). The less previous experience of mothers in the experimental group for taking care of their pneumonic children, might be made them more eager to receive educational program and hence to improve their knowledge and change behavior. Moreover, perceived threat from higher morbidity and mortality rate of pneumonia motivated mothers for receiving educational program, so that, they could provide care to their pneumonic children.

Mothers' of the study group in the present study gained statistically significant ( $p < 0.001$ ) behaviors score compared to those of the control group (Table 3). This high score was probably because of educational session. Learning by active involvement is believed to the best way. During demonstration, discussion with objects (doll, thermometer in this study) for better learning, were supported by the Dual Coding Theory (DCT) of Paivio<sup>14</sup>. However, during the educational session their sick babies by their side, instead of doll and other equipments as visual aids, helped them to learn and receive better.

According to the DCT, verbal entities or information, "the logo gens", and information provided by an object or picture 'the images, are stored in different part of brain simultaneously in the same time through an interconnectivity system. Learning takes better when information provided by demonstration than mere discussion through a verbal process. Learning through demonstration is also supported by Social Learning Theory of Bandura<sup>15</sup>.

The findings of the study provided an eye opener for the care giver and also the policy maker to take comprehensive program so that mothers' knowledge regarding different childhood diseases may be improved and change their behavior during time in need most.

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