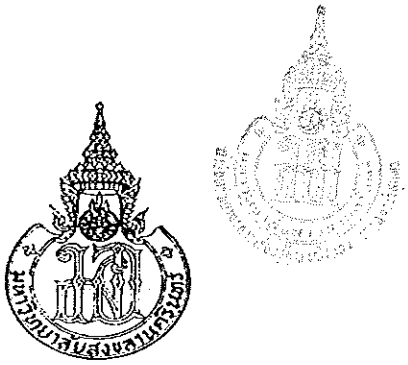

The Effects of Educational Program on Child Care Knowledge and Behaviors of Mothers of Children Aged Under Five Years with Pneumonia

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ABSTRACT

This quasi-experimental, two-group, pre-posttest design was selected to examine the effects of educational program on child care knowledge and behaviors of mothers of children aged under five years with pneumonia. The subjects were fifty mothers of hospitalized children aged under five years diagnosed with pneumonia. They were purposively and equally assigned into either experimental group which received education together with routine care or control group which received only routine care. The instruments used for data collection were the mother's knowledge questionnaire and behavioral checklist which were validated by three experts. The internal consistency reliability of the mother's knowledge questionnaire was $\alpha = .72$ and the interrater reliability for behavioral checklist was .70. Subjects' demographic characteristics were analyzed by using frequency, percentage, mean, and standard deviation. The Chi Squire Test and Fisher's Exact Test were used to test the homogeneity of demographic data. Independent t-test and paired t-test were used to examine the mean difference of knowledge and behavior scores of both groups.

The results revealed that after participating in this program, the mean scores of knowledge and behaviors of the experimental group were significantly higher than those of the control group ($p < .00$). Thus, the educational program developed in this study demonstrated its benefits to children with pneumonia and their family. It also proved that nurses play an important role in preparing mothers of children under five years to be able to take care of their children by using simple strategy of flipchart, leaflet, and demonstration. The program is also practical to implement in the clinical settings.

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CHAPTER 1

INTRODUCTION

Background and Significance of the Problem

Pneumonia is a disease that occurs worldwide and is often fatal in developing countries. All around the world, 5,000 childhood deaths occur every day (Anthony et al., 2008), 1.9 million children aged under 5 years die each year, and 70% of them is in Africa and South-East Asia (Williams, Gouws, Boschi-Pinto, Bryce, & Dye, 2002). Every year, more than 150 million children are facing pneumonia as a new incidence. Among these children, 11-20 million of them have fatal episode which require hospitalization. More than 95% of those episodes of clinical pneumonia occur in developing countries (Rudan, Tomaskovic, Boschi-Pinto, & Campbel, 2004). In Bangladesh, pneumonia is the leading cause of morbidity and mortality among young children. It is estimated that, 400 children aged under five years die each day due to pneumonia (cited in Rashid, Hadi, Afsana, & Begum, 2001).

The government of Bangladesh has made a great stride in controlling childhood illness including ARI related mortality and morbidity. The government implemented a strategy known as integrated management of childhood illness (IMCI) sponsored by WHO and UNICEF to control ARI and other childhood mortality and morbidity (World Health Organization, Bangladesh, 2010). In spite of great effort in controlling ARI, childhood mortality remains high which is accounted for 21% of all childhood death (Arifeen et al., 2004a).

Bangladesh is a developing country with high illiteracy, especially women (40.8%) (Bangladesh Bureau of Educational Information and Statistics, 2006). Poverty, malnutrition, and many other factors cause pneumonia which require early research and emergency intervention to save the children from pneumonia. Rashid et al. (2001) reported that some mothers stated pneumonia incorrectly. In their beliefs, pneumonia occurs due to child's exposure to cold air, wind, water, or food; due to super natural causes such as 'evil spirit' and 'evil winds' which, in turn, lead them to provide care improperly. They found that forty percent of mother used homecare remedies, for example, they massaged the child's chest with mixture of warm oil and garlic or mixture of oil and black cumin seed to loosen the cough. Some mothers also fed the child with the juice extracted from basil leaf, honey lemon juice and warm fluid. Some mothers used mastered oil as a home remedy either to their children's bodies or their own bodies. Some mothers went to indigenous healer and received herbal massage and medicine, and some went to religious healers (kobiraj). A large number of mothers received allopathic treatment. Although none of the mothers mentioned any harmful practices, home care remedies might inadvertently lead to delay in seeking medical care (Rashid et al.). Research is still needed to explore how to teach mothers to get to know the concept of pneumonia and how to provide proper care to the children. Although Stewart, Parker, Chakraborty, and Begum (1994) reported that some Bangladeshi mothers could recognize pneumonia, could recognize the sign of severe pneumonia such as labored breathing, chest retractions, lethargy, and inability to feed which require treatment outside the home, sometimes they believed that pneumonia was caused by evil influence and thus, in these cases the

children were treated by spiritual healers; as a result, allopathic treatment was delayed or avoided.

However, not only Bangladesh but also most of the developing countries have more or less perception and practice regarding pneumonia. Denno, Bentsi-Enchill, Mock, and Adelson (1994) mentioned that in Kumasi, Ghana, 73% of mothers mentioned 'cold' as a direct cause of cough, 21% of them blamed that worm (hook worm or pin worm) was responsible for cough and fever, 25.9% mentioned that constipation was responsible for cough. None of the mothers knew of pathogens as a cause of cough and fever. They sought more health care facility when their child was more severely ill. Mothers used homecare practice to treat baby such as ephedrine or other types of nasal drops, herbal medicines, antipyretics, and antibiotics. They often used honey and cough syrup to treat cough and fever. More than 25% of the mothers used castor oil and enemas to prevent pneumonia which had potentially harmful effects. Findings of Denno et al.'s study indicated a need for a health educational program for mothers of children aged under five years.

From these studies in Bangladesh and some other developing countries, it was shown that most mothers had lack of knowledge. They do not know that pneumonia is caused by organisms, some can recognize pneumonia more or less, and some have misbeliefs which lead them in a wrong way of providing proper treatment for their child. Thus, mothers need to know of the causes of pneumonia, the signs and symptoms, factors related to it, what to do when their child has pneumonia, and how to take care of them. By providing education to the mothers, they can take care of their children in the right way which will further help reducing the mortality and morbidity related to pneumonia in Bangladesh.

Vu-T (2003) found that mothers' academic background had a significant impact on both knowledge and practice in ARI care. Educated mothers were likely to have better knowledge of ARI care and seek for medical treatment when their children had ARI. He also suggested that giving more specific health education to the mothers regarding ARI could minimize preventable deaths in children. Another study also supports that there is positive impact of educational program on nutrition for mothers in reducing respiratory symptom in infants during the first year of life (Vitolo et al., 2008). Positive impact of educational program for improvement of knowledge and skills are well documented. To enhance mother' understanding, there are many methods and medias to convey educational program from simple lecture, demonstration, flip chart, and leaflet to high-tech audiovisual aids. Flip chart combined with other methods was found to be quick and inexpensive visual aids for educating small groups of participants. (Akram et al., 1997; Pullen et al., 2003; Caniza, Maron, Moore, Quintana, & Liu, 2003). Thus, the educational program in this study used flip chart together with lecture, demonstration, and return demonstration as methods/ technique in order to increase mothers' knowledge and skills regarding care of children with pneumonia.

In summary, in Bangladesh, there have been a lacks of knowledge and practice regarding pneumonia. Mothers still prefer to treat their children with their old remedies and seek help from traditional healers. In order to improve knowledge and practice, educational programs specific to care and prevention of pneumonia are necessary. Therefore, this study was aimed to investigate the effects of educational programs on mother's knowledge and behaviors in the context of Bangladesh, which

can effectively increase the level of mother's knowledge and behaviors to minimize preventable death in children with pneumonia.

Objectives of the Study

The objective of the study was to examine the effects of the educational program on child care knowledge and behaviors of mothers of children aged under five years with pneumonia. Specific objectives of the study are:

1. To describe the extent of child care knowledge and behaviors of mothers of children aged under five years with pneumonia after treatment.
2. To compare the mean score of child care knowledge and behaviors of mothers of children aged under five years between those mothers who received educational program and those mothers who received routine care.

Research Questions of the Study

The research questions are as follows:

1. What is the extent of child care knowledge and behaviors of mothers of children aged under five years with pneumonia within each group before and after receiving education?
2. What are the differences of child care knowledge and behaviors of mother of children aged under five years with pneumonia between experimental and control group?

Conceptual Framework of the Study

Conceptual framework of the study for development of curriculum/content for mother's education has been modified from Bloom's Taxonomy (Blooms, 1956). The Bloom's Taxonomy proposed three domains of learning; cognitive, affective, and psychomotor. Cognitive domain provides the statements about levels of knowing. The hierarchical sequence of learning goal in cognitive domain is knowledge, comprehension, application, analysis, synthesis, and evaluation (Anderson & Sosniak, 1994). The affective domain is concerned with learners' attitudes, personal beliefs, and values. The elements of affective domain according to hierarchy are receiving, responding, valuing, organizing and initializing new information (Krathwohl, Blooms, & Masia, 1964). The third domain is psychomotor which is related to physical movement, coordination, and use of the motor skills. Dave (1975) listed the five major categories starting from the simplest behavior to the most complex behavior in this domain, which are imitation, manipulation, precision, articulation, and naturalization.

For the purpose of this present study, the researcher modified the taxonomy of blooms and used only two domains among three: cognitive and psychomotor, as objectives of the study was to investigate the effects of educational program on child care 'knowledge' and 'behavior'. Furthermore, the researcher used some simple elements of both domain such as knowledge, comprehension, and application in cognitive domain, and imitation and manipulation in psychomotor domain. In cognitive domain, mothers can recall information (knowledge), understand information (comprehension), interpret information, and use acquired knowledge and understanding from education session to take care of their child's illness in the

necessary circumstances. In psychomotor domain, mother can assume and reproduce observed behavior (imitation); she also can demonstrate learned behavior (manipulation) in detecting and providing care of pneumonia.

The researcher did not use the elements such as analysis, synthesis, and evaluation of cognitive domain and precision, articulation, and naturalization of psychomotor domain due to the complexity of those elements. These complex elements of both (cognitive and psychomotor) domains may also not fit with the expected levels of knowledge and skills of mothers. The cognitive domain focused in this study included knowledge of caring of children with pneumonia, such as definition of pneumonia, causes of pneumonia, classification of pneumonia, signs and symptoms of pneumonia, signs and symptoms which require hospitalization, treatment and medication, feeding related to pneumonia, factor related to pneumonia, immunization, and prevention. The psychomotor domain focused on mother's behavior or action regarding care of child with pneumonia such as counting respiratory rate, identifying chest retraction, measuring temperature, providing tepid sponging, cleaning nose or airway and preparing medication.

At present, there are many strategies from simple inexpensive chalk-board and paper-pencil to high-tech and expensive medias to teach the people in this intellectual world. In the context of Bangladesh, the researcher would like to use the simple strategy (media) of flip chart, leaflet, and demonstration to teach the mothers. These medias are not only inexpensive but also easily accessible at anywhere in the country. Furthermore, these medias are also very simple to use and can even be used by the less skilled health personnel. All these advantages of the mentioned methods are contextually appropriate in Bangladesh.

The conceptual framework of the study is shown in Figure 1.

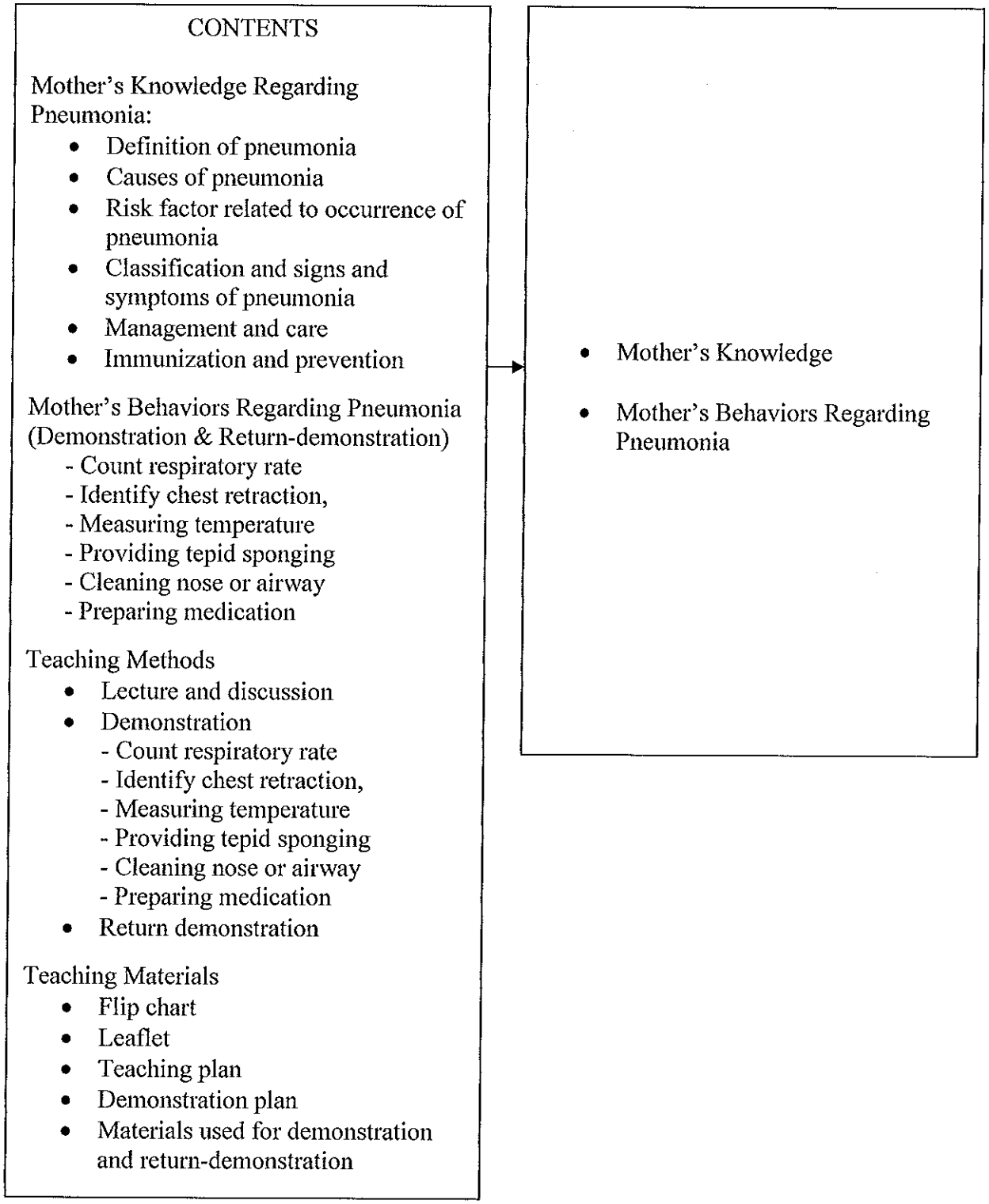

Figure 1

Conceptual Framework of the Study

Research Hypothesis

There are significant differences of mothers' knowledge and behaviors between the experimental and the control group.

Definition of Terms

Mothers' knowledge refers to the level of mothers' understanding about various aspects of pneumonia including definition, causes, risk factors, classification and signs and symptoms, management and care, immunization and prevention of pneumonia. Mothers' Knowledge Questionnaire composed of 44 true-false questions. Each correct answer was worth 1 point and each incorrect answer was worth '0' point. The higher total score indicated the higher level of knowledge.

Mothers' behaviors refer to mothers' behaviors for caring of children with pneumonia. These behaviors include counting respiratory rate, identifying chest indrawing, measuring body temperature, providing tepid sponging, cleaning nose or airway, and measuring medication. It was measured by the Behavioral Checklist. The checklist was used to observe six behaviors with 20 items. Each behavior performed correctly was worth 1 point and incorrectly was worth '0' point. The higher total score indicated the higher level of behaviors.

Educational program refers to knowledge provided for mothers having hospitalized children under five years with pneumonia. The education was provided in a group of 3 to 5 mothers. The program was developed by the researcher. The main contents included knowledge regarding pneumonia discussed earlier. A two-hour session was conducted using lecture, demonstration and re-demonstration with flip

chart, leaflet, teaching plan, demonstration plan, and materials used for demonstration and return-demonstration.

Routine care refers to the care provided by the duty nurses as their routine work, such as giving medication, providing suction to remove cough, providing oxygen as needed, ensuring feeding, etc. It does not include educational program.

Significance of the Study

This study contributes to provide direct benefit to pediatric children with pneumonia and their family who join the educational program. In addition, this educational program helps the mothers to detect pneumonia, which is helpful in early diagnosis and treatment and thus, reduce mortality and morbidity related to pneumonia. This study serves as a pioneer of health education research for student of bachelor and master of nursing science not only in the clinical settings but also in the community (nursing) settings.

CHAPTER 2

REVIEW OF LITERATURE

This chapter explores literature related to the study. Related information is presented as follows:

1. Concept of Pneumonia
    - Definition of pneumonia
    - Classification of pneumonia
    - Causes of pneumonia
    - Risk factors related to occurrence of pneumonia
    - Pathophysiology of pneumonia
    - Signs and symptoms of pneumonia
    - Diagnosis of pneumonia
    - Management of pneumonia
    - Prevention of pneumonia
    - Impact of pneumonia
2. Bloom's Taxonomy
3. Educational Program
4. ARI Control Program in Bangladesh

Concept of Pneumonia

Definition of pneumonia

Pneumonia is an acute inflammation of lower respiratory tract or lung parenchyma (Khan & Rahman, 2004). For the purpose of providing antibiotic

treatment, WHO defined clinical pneumonia simply as fast breathing or lower chest wall indrawing in a child presenting with cough or difficult breathing. According to place of acquiring infection, pneumonia may be community-acquired or hospital acquired. Community acquired pneumonia (CAP) is a type of pneumonia which a person acquired from outside the hospital (Ostapchuk, Roberts, & Haddy, 2004). Hospital acquired pneumonia or nosocomial pneumonia is the type of pneumonia which occurs at least 2 days after admission to a hospital (Khan & Rahman).

Classification of pneumonia

For the purpose of case management, WHO classified pneumonia as follows: For children aged younger than 2 months, pneumonia is classified into three groups; no pneumonia, severe pneumonia, and very severe disease. No pneumonia is described as the child having only cough or cold but no fast breathing (less than 60 per minute) and no chest indrawing. Severe pneumonia is described as a child having fast breathing (60 per minute or more) and severe chest indrawing. Very severe disease is described as a child unable to take enough feeding, having convulsions, abnormally sleepy or difficult to wake, stridor in a calm child, wheezing and fever or low body temperature (Khan & Rahman, 2004). For children aged 2 months to 5 years, pneumonia is classified into four groups; no pneumonia, pneumonia, severe pneumonia, and very severe disease. No pneumonia is described as a child having only cough or cold but no fast breathing (less than 50 per minute for a child aged 2 to 12 month and less than 40 per minute for a child aged 12 month to 5 years) and no chest indrawing. Pneumonia is described as a child having cough or cold with fast breathing (50 per minute or more for a child aged 2 to 12 month and less than 40 per minute or more for a child aged 12 month to 5 years) but no chest indrawing. Severe

pneumonia is described as a child having cough or cold with fast breathing (50 per minute or more for a child aged 2 to 12 month and less than 40 per minute or more for a child aged 12 month to 5 years) and chest indrawing. Very severe disease is described as a child unable to take enough feeding, having convulsions, abnormally sleepy or difficult to wake, stridor in a calm child, or severe under nutrition (Khan & Rahman). The WHO classification of pneumonia for case management is shown in figure 2.

Age group	Classification
< 2 months	- No pneumonia: only cough or cold but no fast breathing and no chest indrawing. - Severe pneumonia: cough or cold with fast breathing and severe chest indrawing - Very severe disease: unable to take enough feeding, convulsions, abnormally sleepy or difficult to wake, stridor in a calm child, wheezing and fever or low body temperature.
2 months to 5 years	- No pneumonia: only cough or cold but no fast breathing and no chest indrawing. - Pneumonia: cough or cold with fast breathing but no chest indrawing. - Severe pneumonia: has cough or cold with fast breathing and chest indrawing. - Very severe disease: unable to take enough feeding, convulsions, abnormally sleepy or difficult to wake, stridor in a calm child, or severe under nutrition.

Figure 2

Case Management Classification of Pneumonia

Causes of pneumonia

More than hundred microorganisms can cause community acquired pneumonia, but different age groups are at risk for different types of organisms.

From birth to 20 days of age, most common causative bacteria for CAP are Escherichia coli, Group B streptococci, and Listeria monocytogenes, whereas less common causative bacteria comprises anaerobic organisms, Group D streptococci, Haemophilus influenzae, Streptococcus pneumoniae, and Ureaplasma urealyticum. Cytomegalovirus & Herpes simplex virus fall in less common viral cause (cited in Ostapchuk et al., 2004).

From 3 weeks to 3 months of age, most common causative bacteria for CAP are Chlamydia trachomatis, and Streptococcus pneumoniae. Most common causative viruses are adenovirus, influenza virus, parainfluenza virus 1, 2, 3, and respiratory syncytial virus. Less common causative bacteria in this age group are Bordetella pertussis, H. influenzae type B and nontypeable, Moraxella catarhalis, Staphylococcus aureus, and U. urealyticum. Less common causative virus in this age group is Cytomegalovirus (cited in Ostapchuk et al., 2004).

From 4 months to 5 years of age, most common causative bacteria for CAP are Chlamydia pneumoniae, Mycoplasma pneumoniae, and Streptococcus pneumoniae. Most common causative viruses include adenovirus and influenza virus. Less common causative bacteria in this age group are H. influenzae type B, Moraxella catarrhalis, Mycobacterium tuberculosis, Neisseria meningitis, and Staphylococcus aureus. Less common causative virus includes Varicella-zoster virus (cited in Ostapchuk et al., 2004).

Viral pneumonia occurs most often in winter than in the spring and summer whereas bacterial infections can occur at any time of the year (Ostapchuk et al., 2004). The rates of acute respiratory infection is higher during the colder months (Hortal et al., 1990)

Risk factors related to occurrence of pneumonia

Many risk factors related to occurrence of pneumonia are difficult to distinguish adequately because they are very closely related to poverty. However, in general, housing, nutrition, and indoor air quality stand out as the important risk factors within communities (Mulholland, 2003). Malnutrition is the most important risk factor for childhood pneumonia. The risks of increasing childhood pneumonia were also linked with low birth weight, non-breastfeeding, crowding, high parity, and incomplete vaccination status, but not with socioeconomic status or environmental variables (Fonseca et al., 1996). However, these factors can simply be divided into personal factors and environmental factors.

Personal factors. The personal factors which were found to have a relationship with prevalence of acute respiratory infections (ARI) included age factors, malnutrition, Vitamin A and Zinc deficiency, parent's education, and socioeconomic condition.

1. *Age.* Infant (age <12 month) had 1.8 times and a toddler (age 12-23 months) had 1.5 times significantly higher risk of suffering from ARI ($p < 0.001$) than a child (age 24-59 month). It was found that for mothers aged less than 20 years, their children have 46% more risk of suffering from ARI than children of mothers aged more than 20 years (Azad, 2009)

2. *Malnutrition.* Ballard and Neumann (1995) explored that underweight (weight-for-age < 80 % of expected) and stunting (height-for-age < 90 % of expected) had positive association with ALRI (acute lower respiratory tract infection). Findings suggested that improvement of nutrition such as breastfeeding, diets adequate in quality and quantity might contribute to lowering the incidence of ALRI. Azad (2009) found that a malnourished child (with growth stunting) had 19% higher risk of suffering from ARI compared to children who were not malnourished. Zaman et al. (1996) also found malnutrition as a significant predictor of ALRI. They concluded that improvement of nutritional and cell-mediated immune status in rural Bangladeshi children should reduce the incidence of ALRI.

3. *Vitamin A and Zinc deficiency.* The children who have vitamin A deficiency had double or greater risk of respiratory tract infection and death from pneumonia, reported by some observational studies (Sommer, Katz & Tarwotjo, 1984; Bloem et al., 1990). But meta-analysis report of The Vitamin A and Pneumonia Working Group (1995) of WHO stated that vitamin A had no apparent benefit in the prevention of pneumonia. Zinc also had an association with pneumonia. Truong-Tran et al. (2002) found that zinc was directly related with lung inflammation due to infection and its deficiency caused inflammation of airway and cellular damage.

4. *Parent's education.* Azad (2009) found that mother's education had relationship with prevalence of acute respiratory infections (ARI). Children of uneducated mothers or mothers with primary education had 20% higher risk of suffering from ARI compared to children of mothers with secondary or higher education. Ballard and Neumann (1995) found that low parental literacy was a risk factor along with other risk factor which contributed to the lower respiratory

infections in young children. Researcher suggested that improving nutrition and parental literacy might contribute to lowering the incidence of acute lower respiratory infections. Dackam and Van (1988) mentioned that maternal education was a major socioeconomic factor in childhood mortality, but few years of school education of mother did not determine a decrease in infant mortality. It required at least 10 years of successful schooling for mothers in changing of habits and customs to decrease infant mortality.

5. *Socioeconomic condition.* Azad (2009) found that socioeconomic condition (wealth) had relationship with prevalence of acute respiratory infections (ARI). Children from lower socioeconomic families had 30% more risk of suffering from ARI compared with children of higher socioeconomic families.

Environmental factors. Environmental factors included air pollution, smoking, and overcrowding.

1. *Air pollution.* Exposure to unprocessed solid fuels had increased the risk of pneumonia in young children (Dherani et al., 2008). Throughout the developing world, biomass fuels were used for cooking and heating which polluted the air. Children and their mothers were continuously exposed to these extreme levels of indoor air pollution. Provision of a simple stove could reduce household smoke which might lead to a measurable reduction of pneumonia in young children, (Mulholland, 2007). Reduction of household IAP (indoor air pollution) from solid fuel either by using other fuels, or improving combustion and ventilation, or taking any other possible measures, might importantly contribute to the prevention of pneumonia morbidity and mortality (Dherani et al).

2. *Smoking.* Exposure to environmental tobacco smoke after birth was a cause of acute chest illness in young children and there was a causal relationship between parental smoking and acute lower respiratory illness in infancy (Strachan & Cook, 1997). Furthermore, the risk of sudden infant death syndrome (SIDS) was double when mother smoked (Anderson & cook, 1997). The prevalence of asthma, wheezing, cough, phlegm, breathlessness, and all the symptoms increase when parents smoke. However, maternal smoking was found to have greater effect than paternal smoking (Cook & Strachan, 1997).

3. *Overcrowding.* Overcrowding was found to be a factor in increasing of the risk of childhood pneumonia. There was a trend of increasing risk with the total household size and the number of children at home (Fonseca et al., 1996). Inadequate sleeping space was found to be a factor in increasing of the risk of acute lower respiratory tract infection in children less than five years of age (Dharmage, Rajapaksa, & Fernando, 1996). Overcrowding had to be categorized as definite risk factors related to the host and the environment that affect the incidence of childhood clinical pneumonia in the community in developing countries (Rudan, Boschi-Pinto, Biloglav, Mulholland, & Campbell, 2008).

Pathophysiology of pneumonia

Mucociliary system in the upper respiratory airway and alveolar macrophages and neutrophils trap the pathogens responsible for respiratory infection. When organism can overcome these respiratory defenses, pneumonia occurs. Mucociliary system may be inhibited by smoking, general anesthesia, chronic bronchitis, immobility and endotracheal intubations. When the barrier of mucociliary system is weak, pathogens are able to reach the alveoli where they overwhelm the phagocytic

cells. There are also some organisms which can release enzymes or toxins that disable the mucociliary or macrophage defenses. Gastric contents aspiration, smoke or toxic gases inhalation, physical trauma and some chronic disease destroy the epithelial lining of bronchus or alveoli, creating significant inflammation that makes it easier for pathogen to gain entry. Sometimes pathogen may come from other sites of body infection to the lung capillaries, where they cross into interstitial tissue. After all of these events, inflammation and the specific immune response causes alveolar edema and accumulation of white blood cells, producing congestion and inhibit gas exchange which cause hypoxemia (Thomas, 1993).

Signs and symptoms of pneumonia

Children with CAP might have fever, tachypnea, breathlessness, and difficulty in breathing, cough, wheeze, headache, abdominal pain, or chest pain (British thoracic society standards of care committee, 2002). Bacterial pneumonias usually have a rapid onset, characterized by high fever with shaking chills, pain on inspiration, crackles, ronchi, and decreased breath sounds on auscultation, elevated white blood cells count, and cough producing purulent sputum. Patient with atypical (beyond bacterial) pneumonia symptoms developed more slowly than bacterial pneumonia, generally had lower temperature, non-productive cough, and systemic symptoms such as myalgia, headache, sore throat, etc. Chest x-rays showed white infiltrates in the affected areas (Thomas, 1993).

Signs and symptoms according to severity. Infant with mild pneumonia had fever less than 38.5°C, respiration less than 50 per minute, mild recession and taking full feeds whereas children with severe pneumonia had fever more than 38.5°C, respiration more than 70 per minute, moderate to severe recession, nasal flaring,

cyanosis, intermittent apnea, grunting respiration, and unable to take food. Older children with mild pneumonia had fever less than 38.5°C, respiration less than 50 per minute, mild breathlessness and no vomiting. Children of this age group with severe pneumonia had fever more than 38.5°C, respiration more than 50 per minute, severe difficulty in breathing, nasal flaring, cyanosis, grunting respiration, and sign of dehydration (British Thoracic Society Standards of Care Committee, 2002)

Signs and symptoms according to pathogens. Features of bacterial lower respiratory tract infection comprised fever more than 38.5°C, respiratory rate more than 50 breaths/ min, chest recession, and wheezing was a sign of mycoplasma infection, clinical and radiological signs of consolidation rather than collapse. Features of viral lower respiratory tract infection are presented usually among infants and young children with wheeze, fever more than 38.5°C, marked recession, hyperinflation, respiratory rate normal or raised. Radiograph shows hyperinflation and, in 25%, patchy collapse, lobar collapse when severe, (British Thoracic Society Standards of Care Committee, 2002). However, only a single sign, fast breathing of 50 breaths per minute can adequately identify the severe pneumonia in children (Redd et al., 1994).

Diagnosis of pneumonia

Alberta Medical Association makes diagnosis of pneumonia through clinical assessment and investigations. Clinical assessment comprises history, identifications of risk factors and co-morbidity, and physical examination. Investigations include x-ray, blood test, pulse oxymetry etc.

Clinical assessment. History includes fever with or without chills, new onset of productive or unproductive cough, chest and or abdominal pain, difficulty in

breathing, and constitutional symptoms such as malaise or lethargy, headache, nausea or vomiting, and myalgias. Identifications of risk factors and co-morbidity includes recent upper respiratory tract infection; exposure to environmental tobacco smoke, daycare center attendance; underlying disease specially which affects cardiopulmonary or immune system, or neuromuscular disorder; recent hospitalization; malnutrition; lower socioeconomic status; prematurity until one year of age; and cystic fibrosis. Physical examination includes body temperature of 38.5°C or more, tachypnea, chest indrawing, signs of consolidation (diminished chest expansion on palpation, localized dullness on percussion, and diminished air entry, localized crackles, bronchial breath sound pleural rub on auscultation) (Alberta Clinical Practice Guidelines Steering Committee, 2002).

Investigations. Investigations include chest x-ray incase of child with respiratory distress; pulse oxymetry incase of child with tachypnea; blood for CBC (complete blood count) and differential count, and blood cultures recommended for child with bacterial pneumonia; for Mycoplasma, mycoplasma IgM (immunoglobulin M), cold agglutinins (limited value); RSV (respiratory syncytial virus) testing but not recommended routinely (Alberta Clinical Practice Guidelines Steering Committee, 2002).

Management of pneumonia

It is well-known that the most severe cases of pneumonia are caused by bacterial pathogens, so it is wise to treat the pneumonia promptly with full course of effective antibiotics as a life-saving measure (Wardlaw, Salama, Johansson, & Mason, 2006).

The effective management of cases of pneumonia depends on appropriate antibiotic treatment and supportive care. Particularly, oxygen is very important for more severe cases (Anthony et al., 2008) for all children who exhibit any of the following signs: moderate hypoxia, cyanosis, inability to feed, or a respiratory rate greater than 60 breaths per minute via either nasal prongs or catheter. Treatment should be initiated with either cotrimoxazole or amoxicillin. A child with sign of lower chest wall indrawing, convulsions or an inability to drink should be hospitalized for inpatient care (Sazawal & Black, 2003). Nowadays, amoxicillin is preferred as a first-line treatment for pneumonia, because some studies had found that more severe cases responded better with amoxicillin treatment (Straus et al., 1998)

Although, application of higher doses amoxicillin might be required in settings with high levels of penicillin insensitivity, it stressing the importance of local and regional surveillance for antibiotic resistance. Another recent study found that oral amoxicillin is equivalent to parenteral penicillin for the management of severe pneumonia in a controlled setting (Addo-Yobo et al., 2004) in which some agencies recommend oral amoxicillin as a home treatment of severe pneumonia.

Injectable penicillin is the recommended treatment for WHO-defined severe pneumonia (lower chest indrawing). Multicentre, randomized, open-label equivalency study at tertiary-care centers in eight developing countries in Africa, Asia, and South America showed that, children aged 3-59 months with severe pneumonia treated with oral amoxicillin had equal efficacy like injectable penicillin. So, severe pneumonia can be treated with oral amoxicillin at home in controlled settings (Addo-Yobo et al., 2004).

Prevention of pneumonia

Pneumonia can be controlled effectively by paying attention to environment, nutrition, case management, and vaccines (Mulholland, 2007).

Prevention through vaccines: Immunization can potentially reduce the burden of childhood deaths from pneumonia in developing countries. Vaccines needs against several pathogens that cause pneumonia includes para-influenza virus, *Staphylococcus aureus*, and *Mycobacterium tuberculosis* (Belshe et al., 2004). For prevention, three vaccines: pneumococcal conjugate, Hib (Haemophilus Influenza type B), and measles vaccines, have the possibility to significantly reduce deaths in children aged under five years (Wardlaw et al., 2006). A randomized vaccine trial in Gambia found that nine valent vaccines are highly effective in reducing hospital admission and childhood mortality due to pneumonia (Cutts et al., 2005).

Recently, In Gambia, Hib (Haemophilus Influenza type B) vaccine was proven to be effective and was advised into routine immunization programs of other developing countries (Adegbola et al., 2005). An application of Hib (Haemophilus Influenza type B) and pneumococcal conjugate vaccines were proved safe and effective in preventing radiolologically confirmed pneumonia in children both in industrialized and low income developed countries (Madhi, Levine, Hajjeh, Mansoor, & Cherian, 2008).

In developing countries where vaccines and antiviral drugs are not easily accessible, simple public health measures such as social distancing, masks, and hand hygiene are the only means of controlling outbreaks of emerging respiratory infections or an influenza pandemic (Bell, 2006).

Vitamin A and Zinc supplement. Supplementation of vitamin A can reduce measles associated pneumonia death (The Vitamin A and Pneumonia Working Group, 1995). Daily 20 mg zinc supplementation reduces duration of severe pneumonia and duration of chest indrawing. Adjuvant treatment with zinc accelerates recovery from severe pneumonia (Brooks et al., 2004). Rate of incidence of pneumonia in children in developing countries can be substantially reduced with zinc supplementation (Bhutta et al., 1999), which can substantially reduce pneumonia related death of children under 2 years of age (Brooks et al., 2005). In developing countries where it is difficult to identify the etiology due to limited resources, zinc supplementation can offer substantial promise in reducing pneumonia incidence (Anthony et al., 2008).

Impact of pneumonia

In developing world, more than 150 million incidences of childhood pneumonia occur every year which is 95% of all new cases of world estimation (Wardlaw, Salama, Johansson, & Mason, 2006). Death of children aged under five years due to pneumonia is more than any other illnesses and also more than cumulative figure of AIDS, malaria, and measles, which accounts for one fifth of global death of children aged under five years. About 11 to 20 million of children had been hospitalized each year due to pneumonia and among them; more than 2 million had died (Wardlaw et al., 2006).

Frequency of hospital admission of children with pneumococcal pneumonia is increasing with the complication of necrosis, emphysema/ complicated Para-pneumonic effusion, and lung abscess (Tan et al., 2002). There is a significant impact of childhood respiratory infection on society. It causes frequent physician visit, consumption of antibiotics and over the counter drugs; suffer both patient and their

families, work losses, and decreases quality of life (Shoham et al., 2005). Furthermore, early childhood respiratory tract infections have a significant role in developing atopy and asthma in school-age children, while asthma and chronic bronchitis in adults (cited in Vitolo et al., 2008)

Bloom's Taxonomy

The taxonomy of educational objectives is a framework for classifying statements of teacher's expectation to the learners to learn according to the teacher's instruction. Benjamin Bloom identified the three domains of educational objectives known as Bloom's Taxonomy. The taxonomy proposed three domains of learning, which are cognitive, affective, and psychomotor.

Cognitive domain involves knowledge and the development of intellectual skills. The hierarchical sequence of learning goal in cognitive domain is knowledge, comprehension, application, analysis, synthesis, and evaluation (Anderson & Sosniak, 1994). In knowledge domain, the learners can recall data or information. Examples of objectives used in this domain are defining, describing, identifying, knowing, etc. In comprehension domain, learners are able to understand the meaning, translation, interpolation, and interpretation of instructions and problems. They can state a problem in their own words. Examples of objectives used in this domain are comprehending, distinguishing, explaining, etc. In application domain, learners can use a concept in a new situation or unprompted use of an abstraction. They can apply what was learned in the classroom into novel situations in the work place. Examples of objectives used in this domain are applying, operating, demonstrating, etc. In analysis domain, learners can separate material or concepts into component parts so

that its organizational structure may be understood. They can distinguish facts and inferences. Examples of objectives used in this domain are analyzing, distinguishing, differentiating, etc. In synthesis domain, learners can build a structure or pattern from diverse elements, put parts together to form a whole, with emphasis on creating a new meaning or structure. Creating, modifying, organizing, integrating are the examples of objectives used in this domain. In evaluation domain, learners can make judgments about the value of ideas or materials. Examples of objectives used in this domain are comparing, concluding, evaluating, summarizing, etc.

The affective domain is concerned with learners's attitudes, personal beliefs, and values. This domain includes the manner in which we deal with things emotionally. The five elements of affective domain according to the hierarchy are receiving, responding, valuing, organizing and internalizing new information (Krathwohl, Blooms, & Masia, 1964). The first element, receiving, includes learners' awareness and/or willingness to hear a particular attention. Examples of objectives used in this domain are choosing, following, replying, etc. The second element, responding, includes active participation of the learners. Learner attends and reacts to a particular phenomenon. Learning outcomes may emphasize compliance in responding, willingness to respond, or satisfaction in responding (motivation). Examples of objectives used in this domain are answering, performing, practicing. The third element, valuing, is how much a person values a particular object, phenomenon, or behavior. This ranges from simple acceptance to the more complex state of commitment. Valuing is based on the internalization of a set of specified values, while clues to these values are expressed in the learner's overt behavior and are often identifiable. Examples of objectives used in this domain are demonstrating,

differentiating, explaining, following, forming, initiating, etc. The forth element, organizing, is a person's ability to organize values into priorities by contrasting different values, resolving conflicts between them, and creating a unique value system. The emphasis is on comparing, relating, and synthesizing values. The last element, internalizing (characterization), is a value system that controls learners' behavior. The behavior is which are pervasiveness, consistency, predictability, and most importantly, characteristic of the learner. Instructional objectives are concerned with the student's general patterns of adjustment (personal, social, emotional). Examples of objectives used in this domain are act, discrimination, influence.

The third domain is psychomotor which is related to physical movement, coordination, and use of the motor-skills. Dave (1975) listed the five major categories starting from the simplest behavior to the most complex behavior in this domain, which were imitation, manipulation, precision, articulation, and naturalization. Imitation refers to learners' ability in observing and copying other people. Manipulation is learners' ability to perform a skill when guided via instruction by others. Precision refers to accuracy, proportion, and exactness exists in the skill performance without the presence of the original source, which means learners are able to perform a behavior accurately without any help of others. In articulation, learners are able to perform two or more skills simultaneously, sequentially, and consistently. In naturalization, learners are able to perform two or more skills simultaneously, sequentially, and consistently with ease. Automatism develops in this phase. The performance is automatic with little physical or mental exertion.

The researcher used two domains, cognitive domain and psychomotor domain, among three domains of Bloom's Taxonomy. The cognitive domain was focused on

the knowledge of caring of children with pneumonia. The psychomotor domain was focused on mother's behavior or action regarding care of child with pneumonia.

Educational Program

Health education, media, and method

Health education program is an educational program directed to the general public that attempts to improve, maintain, and safeguard the health care of the community (The Free Dictionary, 2010). For providing educational program, there are some media such as flip chart and leaflet, and some methods such as lecture and demonstration to convey the program.

Flip chart. Flip charts are quick and inexpensive visual aids for educating small groups of participants. With a modest ability at lettering, the presenters can compose the desired flip chart in-house by using felt-tip markers and graphic materials. Flip charts help the speaker proceed through the material and convey information as well as provide the audience with something to look at in addition to the speaker. Also, flip chart can be prepared prior to, as well as during the presentation. Flip charts also have disadvantages such as it may require the use of graphics talent, it is not suitable for using in a large audience setting, and may be difficult to transport. To develop flip charts, each sheet of paper should contain one idea, sketch, or theme. Words, charts, diagrams, and other symbols must be penned in a large enough size to be seen by people farthest from the speaker. In general, make each letter at least 1/32" high for each foot of distance from the material. For example, a 1-inch letter is legible from 32 feet, and a 2-inch letter from 64 feet. Divide the distance from the back of the room to the visual aids by 32 to determine the minimum

size of letters. Other recommendations for making a good flip chart are: Use block lettering, since it is easiest to read; use all capital letters, and do not italicize letters; use a variety of colors; Look from a distance to make sure the color works well and is not distracting. (Presenting Effective Presentations with Visual Aids, 2010)

The national Department of Health, South Africa, has supported the Life Skills and HIV and AIDS Education Program. The department developed a flip chart for Education Program. The flip chart reflected the philosophy of the Life Skills Education Program in which knowledge, skills, values and attitudes were taken into account and that experiential and participatory methodology was suggested. The flip chart was distributed to schools, and on request to health facilities and NGOs. Although the above material has been developed to support of the Life Skills Education Program within schools, feedback indicated that it could be used effectively by a range of facilitators and in multiple settings, for example, professional health workers in public health facilities and informal community settings, and by peer educators. Flip chart was in great demand for a number of reasons such as, it was practical, visually appealing, and comprehensive yet easily understood and that it contributed to facilitators feeling more confident when addressing the various topics (Swart, 2004).

Caniza, Maron, Moore, Quintana, and Liu (2007) made a comparison in their study between the efficacy of two educational tools, videotapes and flip charts, which were commonly used in healthcare and practical sanitation settings in developing countries. The tools have been used for providing hand hygiene education to 67 nurses in a pediatric hospital in El Salvador. Half of the nurses received video-based instruction and half received instruction via flip charts. Both methods of instruction

increased participants' knowledge and were almost similar. Feedback obtained from flip chart users indicated that flip chart was their favorite educational tool. Flip chart was an economical, easily usable, non-technological and effective alternative to videotapes for delivering education in developing countries. It could be used more widely to deliver education in resource-poor settings.

Pullon et al. (2003) conducted a study to describe the development and evaluation of educational programs and associated resources materials to support smoking cessation and reduction and breastfeeding promotion strategies for pregnant woman who smoke, during usual primary maternity care by midwives. Resources developed in this study included videotape, flip chart and laminated information card. Smoking cessation education was designed during antenatal visit of midwives with the pregnant woman. Details of women's and her partner's smoking history were investigated. Information about smoking was discussed using flip chart, and pamphlet pack (Smoke Ed) was introduced. Some videotapes were also shown if time permitted. The trial demonstrated a significant positive change in the smoking behavior during pregnancy by woman whose midwives had delivered the smoking cessation program. The women commented that they understood the resources provided by the midwives, the information provided with the flip chart was memorable.

Akram et al. (1997) studied the effect of intervention on promotion of exclusive breastfeeding in a slum area of Karachi with the objective of improving optimal breastfeeding practice, including promotion of exclusive breastfeeding and giving colostrums to newborns. In this two groups study, 67 mothers in the intervention group and 53 mothers in the control group were registered. Health

education was provided by using flip chart, videos and photographs. Colostrums were given by 97% mothers in the intervention group and 3% in the control group. Majority (94%) of the mothers in the intervention group continued exclusive breast feeding till four months of age against 7% in the control group. It was concluded that health education programs in the antenatal period as well as after birth can promote exclusive breast feeding practices. The results indicated the effectiveness of education program with flip chart, videos and photographs.

Demonstration-Performance method. The demonstration method of teaching provides a "clear picture" of a task. This method of instruction is based on the principle that one learns best by doing. Participants learn physical or mental skills by performing these skills under supervision. This show-and-tell (demonstration) method has certain advantages, as well as disadvantages, over the lecture method.

The advantages of the demonstration/performance method are that the demonstration method appeals to more than one sense of learning. We perceive 75 percent of information through the senses of sight and13 percent by hearing. The demonstration method facilitates the participants to see the skill being performed and hear the explanation at the same time. This allows the participants to relate the principles and theories to a practical situation. The standard of performance expected of the participants in the demonstration method was set. Participants have the tendency and desire to imitate the teacher or trainer; therefore, it is essential that the teacher have a thorough knowledge of the skill so that they can demonstrate it without hesitation or error. The demonstration method emphasizes proper sequence. The procedures for a motor skill are usually a series of steps that must be accomplished in a particular order. An important step in acquiring a new skill is learning the required

steps in proper sequence. The demonstration method is very effective in identifying the precise steps and fixing the exact sequence. The demonstration method provides for individual guidance and evaluation. It is more student-centered and results in a higher level of student participation and involvement than any other methods of instruction. The demonstration method permits reinforcement. Knowledge acquired through a lecture can be made more meaningful through a demonstration, and the highest level of understanding is achieved and reinforced through actual performance of the task. The demonstration/performance method also has some disadvantages. For showing flawless lesson, the demonstration method requires a highly-skilled instructor. Demonstration is difficult with a large number of people. The effectiveness of presentation depends on the student being able to see what they are working on. This requires arrangement of trainees and equipments. The demonstration method is time consuming. This method consumes more time than the lecture method because of the demonstration time and the practice time the trainees must be given if they are going to reach the skill level desired. Demonstration method requires higher instructor/student ratio during performing the process.

There are some techniques for effective demonstration as follows: a) Use the actual equipment to get maximum benefit from the demonstration, b) Use the "whole-part-whole" concept. That is, showing the participants every part of a topic will completely give a step-by-step detailed explanation of how to achieve the task in logical sequence, and evaluating procedures while the participants are performing, as well as at the end of performance. The participants must use the procedures and steps taught in the demonstration. These followings are guidances, which can make the performance successful in terms of time, quantity, and quality.

- Participants should be allowed to work on their own as much as possible.
- The demonstrators should provide instruction and guidance as few as possible, only when required,
- Avoid unnecessary interruption, interference or assistance.
- Leave participants alone as long as the performance is correct. P
- Proficiency comes with time.
- Do not hesitate to interrupt if they make mistakes.
- Consider the requirement of instructor and participants' ratio during the performance.
- Constructively critique the participant's performance to point out problem areas as well as items being completed satisfactorily.

Lecture method. The lecture is a method of instruction in which the instructor presents facts and principles orally. Lectures may be formal or informal. The formal lecture method is usually used for presenting information to the large groups. It mostly facilitates one way communication from instructor to students. Student participation is severely limited in formal lecture. The informal lecture facilitates active student participation. Informal lecture also facilitates two-way communication process and thus achieved best learning. The students participate actively in a relaxed atmosphere; therefore, the informal lecture is encouraged over the formal. The advantage of lecture method is that the instructor can present many ideas to a large group in a relatively short period of time. Thus, it facilitates the effective use of time and manpower. The lecture method can be used as a supplement with other methods of instruction. The disadvantage of lecture method is that the lecture method limits the

amount of student participation. It is not ideal for teaching hands-on skills and it is not an effective method for maintaining student interest.

These followings are guidance for preparing a lecture presentation.

- First, an instructor must become familiar with participants.
- Lesson plan is a guide for instructor to use during presentation.
- Review and correction are needed prior to teaching session.
- Any training aid, if needed, should be checked to ensure its goodness.
- Start the session with the orientation with the subjects.
- Use lesson plan as a guide during presentation.
- Always consider the current teaching environment.
- Try to provide a comfortable, non-distracting learning environment.
- Ensure time to complete lessons.
- Provide logical breaking point as require.
- Consider the mental and the physical state of participants, hunger or fatigue can easily interfere the learning.
- Provide full attention to the participant for best learning outcome.

A successful instructor requires apparent voice, platform mannerisms, sincerity, eye contact, and other communicative skills, besides supportive instructional materials. The strength or weakness of the lesson depends on effectiveness of teaching. There are a number of techniques that can be use to increase the effectiveness of teaching. The following technique can make the lesson more interesting and understandable. An example and illustration should be given to create interest among participants. A comparison should be used to bridge the known and the unknown. Comparison may either factual or imaginary. An example of an imaginary

comparison is called an analogy. An analogy uses a story or incident that parallels with the point which the instructor wants to make. Use statistics to clarify or amplify a point, but must be used sparingly and judiciously. Give testimonies from a real life situation which can relate trainees' thoughts or ideas with what actually happened. In addition to verbal support, visual aids can be used to help clarify and illustrate ideas, especially things which are difficult to explain with word alone.

Good questions effectively help in communicating with participants. There are some rules for asking questions: Ask questions to promote thinking and the process should involve the entire class; ask questions in general rather than some students or the ones who sit in a particular area; allow enough time for the trainee to think and give out answers; questions should be begin with words that require thoughtful answers such as, why, when, how, what, to stimulate students' thinking; clarify the answer for correctness. Encourage individual response rather than choral responses in order to pick up the response accurately; Avoid catch or trick questions to ensure students participation (Methods of instruction retrieved, 2010).

The subjects in this study were the mothers of children aged under five years with pneumonia. The mothers were divided into one control group and one experimental group. The experimental group received education through flip chart discussion, leaflet conveying same massage as contained in flip chart, and demonstration of behavior related to care of children with pneumonia. The control group received only routine care. Both groups took the pretest and post-test to evaluate the program. Teaching materials and contents of the teaching were developed by the researcher based on literature review.

In summary, in developing world, children aged under five years are being attacked with pneumonia which can lead to a severe illness and death. Most mothers still do not know of the causes of pneumonia, how to detect the sign of pneumonia, and how to provide care to their children properly. Therefore, these mothers still need to be educated on the issues of pneumonia and how to provide care to their children. Practically, in Bangladesh, 40.8% women are illiterate and do not know of pneumonia. Thus, the present study was conducted in order to explore the effect of educational program with flip chart, leaflet, and demonstration on child care knowledge and behaviors of mother of children aged under five years with pneumonia. The result of the study would be beneficial for making plan in order to help those women to get familiar with pneumonia and know how to provide care for their children.

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ARI Control Program in Bangladesh

In Bangladesh, 21% of all childhood death was due to pneumonia (Arifeen et al., 2004a). The Government of Bangladesh has made great strides in reducing childhood mortality from early 1980s. Still, childhood mortality remains high which is accounted for 88 per thousand in 2004 and 65 per thousand in 2006 (Bangladesh Demographic and Health Survey, 2007).

To reduce childhood mortality and morbidity and to contribute to improved growth and development of children under-5 years of age, a strategy developed by the World Health Organization (WHO) and UNICEF, known as Integrated Management of Childhood Illness (IMCI) was introduced. The IMCI strategy incorporated many elements of diarrheal disease and ARI control program, as well as child-related aspects of malaria control, nutrition, immunization, and essential drugs program. The Government of Bangladesh decided to pilot the IMCI strategy in 1998. After adaptation of the generic guidelines, implementation of the IMCI strategy was started in 2001 (World Health Organization, Bangladesh, 2010). IMCI strategy was found to be feasible in the context of Bangladesh (Arifeen et al., 2004b).

The National Working Team (NWT) for health in Bangladesh also had developed Community- Integrated Management of Childhood Illness (C-IMCI) strategy to spread the IMCI to the peoples' door and government had approved the document in 2004 (World Health Organization, Bangladesh, 2010)

UNICEF supports the Government of Bangladesh and Non-Government Organizations (NGOs) to implement the Integrated Management of Childhood Illness (IMCI) interventions with the objective to reduce child's deaths due to major

childhood killers: neonatal infections, pneumonia, diarrhea, malaria and malnutrition. (Child Survival in Bangladesh 2010).

Summary

In summary, in developing world, children aged under five years are being attacked with pneumonia which can lead to a severe illness and death. Most mothers still do not know of the causes of pneumonia, how to detect the sign of pneumonia, and how to provide care to their children properly. Therefore, these mothers still need to be educated on the issues of pneumonia and how to provide care to their children. Practically, in Bangladesh, 40.8% women are illiterate and do not know of pneumonia. Thus, the present study was conducted in order to explore the effect of educational program with flip chart, leaflet, and demonstration on child care knowledge and behaviors of mother of children aged under five years with pneumonia. The result of the study would be beneficial for making plan in order to help those women to get familiar with pneumonia and know how to provide care for their children.

CHAPTER 3

RESEARCH METHODOLOGY

A quasi-experimental study was aimed to elicit the effects of an educational program on child care knowledge and behaviors of mothers of children aged under 5 years with pneumonia. In this chapter, the methodological issues were discussed including research design, population and sample, research instruments, data collection, the protection of human subjects, and data analysis.

Research Design

In this quasi-experimental study which had two groups of subjects, control and experimental, pre-test and post-test experimental design was used to examine the effects of educational program on child care knowledge and behaviors of mothers of children aged under 5 years with pneumonia.

Population and Sample

Population

The target population was mothers of the children with pneumonia.

Sample

The sample was mothers of children aged under 5 years with pneumonia admitted in pediatric ward at Dhaka Medical College Hospital, Dhaka, Bangladesh. The sample was selected based on the following inclusion criteria:

(1) A mother that has under 5 years old child/children, being diagnosed with pneumonia with no other complications or associated diseases

(2) Read and speak Bengali well

(3) Never had any educational program on pneumonia before

Subjects were specifically divided into two groups. The first 25 subjects were assigned to be in the experimental group and the next 25 subjects were assigned to be in the control group.

Sample size

Sample size was estimated by using power analysis. Previously, there was no study directly examining the effects of educational program on mothers of children with pneumonia. Thus, the closest study of Ahmed (2008) was selected in order to estimate the effect size. Ahmed examined the effect of breastfeeding educational program on breastfeeding knowledge and practice of Egyptian mothers of preterm infants. It was found that the effect size was as large as $d = 3.68$. Using this effect size together with the power of .80 and α of .05, the number of sample needed in this study was less than 10 subjects per group (Lipsey, 1990). This sample size was considered too small. Considering that the variables were different and the present study was conducted in another country, the researcher then reduced the effect size to .80. Using these parameters, the number of sample size was 25 subjects in each group (Polit & Beck, 2008). In addition, Post hoc power analysis was performed by using the effect size calculated from the data in this study. The effect size of 1.165, alpha of .05, and $n = 25$, yielded a power of .99.

Setting

This study was conducted at Dhaka Medical College Hospital (DMCH), Dhaka, Bangladesh. DMCH is one of the biggest hospitals situated at the center of the capital providing indoor and outdoor patient services. It was a tertiary level (referral) hospital with relatively modern technology and superior treatment facilities compare to other medical college hospitals in Bangladesh. Patients from other district hospitals and from other medical college hospitals are referred to DMCH for specialized treatment. DMCH has 2 pediatric wards (Pediatric ward 11 & 12) with 20 beds in each ward. However, pediatric patients have almost always been overloaded admitted.

Instrumentation

The instruments contained two parts: The instrument used for intervention part and the instruments used for data collection.

The Instruments Used for Intervention

Educational program

Contents of the program consisted of information about pneumonia including definition of pneumonia, causes of pneumonia, risk factors related to occurrence of pneumonia, classification of pneumonia, sign and symptoms of pneumonia, management and care, and immunization and prevention of pneumonia. Information of the content obtained from the literature review and books. The educational program consisted of three teaching, techniques/ methods including lecture and discussion, demonstration, and return- demonstration. In addition, there were three teaching materials used to teach mothers including flip chart, leaflet, and medical equipments. Moreover, teaching plan and demonstration plan were developed in order for the

researcher to conduct the educational program properly and smoothly in the time period.

Teaching techniques or methods

1. Lecture and discussion: Lecture and discussion method was used to deliver the contents of the flip charts

2. Demonstration: After teaching, the researcher demonstrated how to detect signs of respiratory distress which consisted of 6 behaviors including counting respiratory rate, identifying chest retraction, measuring temperature, providing tepid sponging, preparing suspension, and cleaning nose or airway.

3. Return-demonstration: After the researcher demonstrated, mothers were asked to perform return-demonstration of 6 behaviors. Return-demonstration was performed in order for the researcher to judge the level of mothers' behavior. The score was recorded in the checklist. Return-demonstration was taken separately from others participants and independently for each mother.

Teaching Materials

1. Flip chart: Flip chart was developed by the researcher. It consisted of information including definition of pneumonia, causes of pneumonia, risk factors related to occurrence of pneumonia, classification of pneumonia, sign and symptoms of pneumonia, management and care, and immunization and prevention of pneumonia. Information contained in the flip chart was from the literature review and books.

2. Leaflet: Leaflet was also developed by the researcher. Leaflet contained information similar to the flip chart. The leaflet had been given to the participants of experimental group after teaching in order for them to read and enhance their better understanding (Appendix F). Information contained in the leaflet was also from the literature review and books.

3. Medical equipments and doll: Medical equipment and doll were used during demonstration and return-demonstration in order to help mothers remember how to perform activity. Medical equipments and doll used during demonstration and return-demonstration were shown in figure 2.

4. Teaching plan: Teaching plan was developed in order to help the researcher run the educational session smoothly and accurately. The teaching plan included objectives of the lesson, contents, time allocated for each lesson, teaching learning activities or method, media, and evaluation (appendix E).

5. Demonstration plan: Demonstration plan was also developed in order to guide demonstration session smoothly and consequently. The demonstration plan included objectives of the lesson; contents- counting respiratory rate, identifying chest retraction, measuring body temperature, providing tepid sponging, cleaning nose or airway, and preparing suspension; teaching learning activities or method; time allocated for each lesson; media; and evaluation (appendix F).

The lecture and discussion lasted for one hour, then the demonstration was performed by the researcher for one hour.

The teaching location was at the end of the corridor of pediatric ward. The classroom environment was not silent and distracted with sound due to closeness to

the patients' bed which always had some family members of the patients in the corridor near the classroom.

The Instruments Used for Data Collection

The instruments consisted of two questionnaires: Mothers' Knowledge Questionnaire and Behavioral Checklist.

Mothers' Knowledge Questionnaire. Mothers' Knowledge Questionnaire contained 3 parts including Mother's Demographic Questionnaire, Child's Demographic Questionnaire, and Mother's Knowledge Questionnaire.

1. Mother's Demographic Questionnaire: It consisted of 9 items including mother's age, marital status, number of children, religion, level of education, occupation, monthly family income, experience of taking care, and information of health teaching relating to pneumonia (Appendix B).

2. Child's Demographic Questionnaire: It consisted of 4 items including child's age, gender, duration of staying in the hospital, and previous history of pneumonia within last 12 month.

3. Mothers' Knowledge Questionnaire: The Questionnaire was developed by the researcher (Appendix B). It was developed after a review of previous documents from books, website of WHO, and articles related to pneumonia in children. This part consisted of 44 true-false questions related to mothers' knowledge regarding pneumonia. The questionnaire was organized by using 6 topics of pneumonia-related information including: Definition of pneumonia (Q 1); causes of pneumonia (Q 2-4); risk factors related to occurrence of pneumonia (Q 5-9); classification of pneumonia and sign and symptoms of pneumonia (Q 10-23); management and care (Q 24-40);

and immunization and prevention (Q 41-44). The score "1" was given if participant answered correctly. The score "0" was given if participant answered incorrectly.

Behavioral Checklist. This checklist was created by the researcher in order to measure mother's behaviors (Appendix C). Mothers of both experimental and control group were asked to perform behaviors related to caring for children with pneumonia during pre-test and post-test. This part consisted of 6 behaviors including counting respiratory rate, identifying chest indrawing, measuring body temperature, providing tepid sponging, cleaning nose or airway, and preparing medication. In addition, each behavior consisted of 1-6 procedures. Thus, the totals of 20 sub-procedures were measured. The score '1' was given for the "correct" behavior and the score '0' for the "incorrect" behaviors. The "correct" behaviors indicated that mother 'could measure' the behavior and the "incorrect" behaviors indicated that the mother 'could not measure' the behavior. The total score ranged from 0 to 20.

Validity and Reliability of Research Instruments

Validity. Research tools, which were the Mother Knowledge Questionnaire, Behavioral Checklist, Flip chart, Leaflet, and Teaching Plan, were validated by three experts in the field of pediatrics. The experts were one pediatric medicine specialist (pediatrician) from Bangladesh, two pediatric nurse specialists from Department of Pediatric Nursing, Faculty of Nursing, Prince of Songkla University. After receiving suggestions from the experts, the researcher together with the advisors had further revised the final version of the instruments.

Reliability. The Mothers' Knowledge Questionnaire was tested for the internal consistency reliability with 20 mothers of the children aged under 5 years with

pneumonia who had the criteria similar to the subjects of the actual study. The KR-20 was used, yielding a coefficient of .72 which was acceptable for a newly developed questionnaire (Burns & Grove, 2003).

The Behavioral Checklist was used to test for the interrater reliability with 2 observers trained by the researcher. Two observers independently observed and recorded mothers' behaviors at the same time. Data were computed by an index of agreement between observers by using the following equation:

$$\frac{\text{Number of agreement}}{\text{Number of agreement + Disagreement}}$$

The interrater reliability was found to be .70 which was acceptable (Polit & Beck, 2008).

Translation of the Instruments

The original instruments were developed by the researcher in English language. After validated, the English version of the instruments was directly translated into Bengali language by a bilingual English-Bengali expert from government approved translation centre. This Bengali version again was retranslated from Bengali to English by another bilingual English-Bengali expert from government approved translation centre. Then, both English and Bengali versions were checked by one physician from Bangladesh for the discrepancies of language and the accurate meaning of medical term. Then, the instruments were reviewed and used for data collection.

Data Collection

Data collection consisted of 2 phases: The preparation phase and the intervention phase.

The preparation phase

Data were collected after obtaining the approval of thesis proposal by Institutional Review Board (IRB) of the Faculty of Nursing, Prince of Songkla University, Thailand. Permission was also obtained from the director of DMCH, and the head nurse of the pediatric ward. Then, the researcher explained the objectives, design, duration, and the study protocol to the head nurse.

The researcher practiced lecturing and demonstrating topics in the educational program in order to provide effective teaching of the educational program by using lesson plan for smooth delivering of information, maintaining consistency of time with each lesson. The researcher himself maintained all the aspects of data collection procedure.

The Intervention phase

The Experimental group. Education was given in a group of 3-5 mothers in each session.

(1) On the first day before educating, participants were asked to fill in the demographic form and respond to the Mothers' Knowledge Questionnaire. Then, the researcher provided knowledge including discussion related to pneumonia by using flip chart. The duration of the teaching session was one hour for knowledge part and one hour for demonstration part. To ensure their understanding, the participants were

asked to clarify their concerns after teaching. Leaflet was also given to the participants after the end of the session.

(2) After educating, the researcher demonstrated how to count respiratory rate, identifying chest indrawing, measuring body temperature, preparing the medication and cleaning nose or airway. Real babies were shown to teach counting respiratory rate and measuring temperature. Real babies and picture of chest retraction altogether were used to teach identifying chest retraction. The doll was used to demonstrate tepid sponging. After the demonstration, the researcher then asked the understanding of mothers. If any mother did not clearly understand how to perform of these procedures, the researchers would demonstrate again and again in order to confirm their understanding. The demonstration lasted one hour.

(3) On the second day, participants were asked to do post-test by filling answer in the Mothers' Knowledge Questionnaire.

(4) Then, participants were asked to perform/return-demonstrate the 6 behaviors. The researcher observed and evaluated the participants' performance by using the behavioral checklist form. Each subject was observed separately for around 20-30 minutes.

The Control group. Mothers of the control group received only routine care.

(1) On the first day, they were asked to do pretest by filling answer in the Mothers' Knowledge Questionnaire.

(2) On the second day, participants were asked to do post-test by filling answer in the Mothers' Knowledge Questionnaire.

(3) Then, participants were asked to perform the 6 behaviors. The researcher observed and evaluated the participants' performance by using the behavioral checklist form. Each subject was observed separately for around 20-30 minutes. Diagram of the study design was shown below in Figure 3.

Group name	Pretest	Intervention		Post test	Behavior performance of Subjects
		Lecture with flip chart	Demons tration		
Experimental group	√	√	√	√	√
Control group	√	×	×	√	√

Figure 3

Diagram of Two Assigned Groups

Ethical Considerations

To ensure that the right of human subjects would be maintained, the study and its procedures were approved by the Institutional Review Board (IRB), Faculty of Nursing, Prince of Songkla University, Thailand. Written permission was obtained from the director of DMCH. Permission for data collection was also taken from head of the pediatric department, DMCH. A written consent was obtained from each participant (Appendix A).

The participants were assured that the study was not a harm or risk for them. The name of participants would not be discovered and a code number would be used for their name so that their identity and score would be private. In addition, all of their

information and responses in connection with this study would remain confidential. Only the researcher could be eligible to access the data. Neither their name nor any identifying information was used in the report of the study.

The results of the study were written for publication which perhaps could help in promotion of nursing education and the improvement of nursing profession in the future. Participation in this study was voluntary and there was no cost for participating in this study.

The participants were ensured that they had the right to participate or not to participate and also had the right to withdraw at any time. Their willingness or unwillingness would not result in any penalty. Lastly, signature in the consent form indicated that they understood of what involved in the study and had given their consent to participate in this study. They were free to join the session and could ask any questions about the study or being a subject.

In addition, the researcher informed the mothers of the control group that, at the end of the study, if they want to take the educational program, the researcher would provide the program similar to the experimental group on the second day after post test. Leaflet would also be given to them for their personal benefit after post test.

Data Analysis

Data were analyzed statistically by using computerized software program. The analysis included descriptive and inferential statistics to answer the research question. Demographic data of mothers and children were analyzed by frequency, percentage, mean and standard deviation. Pearson Chi Squire Test and Fisher's Exact Test were

used to test the homogeneity of demographic data. The mean difference of mothers' knowledge of each group (within) regarding pneumonia was analyzed by using paired t-test. Independent t-test was used to compare the mean difference of post-test scores of mothers' knowledge of both groups.

RESEARCH PROTOCAL

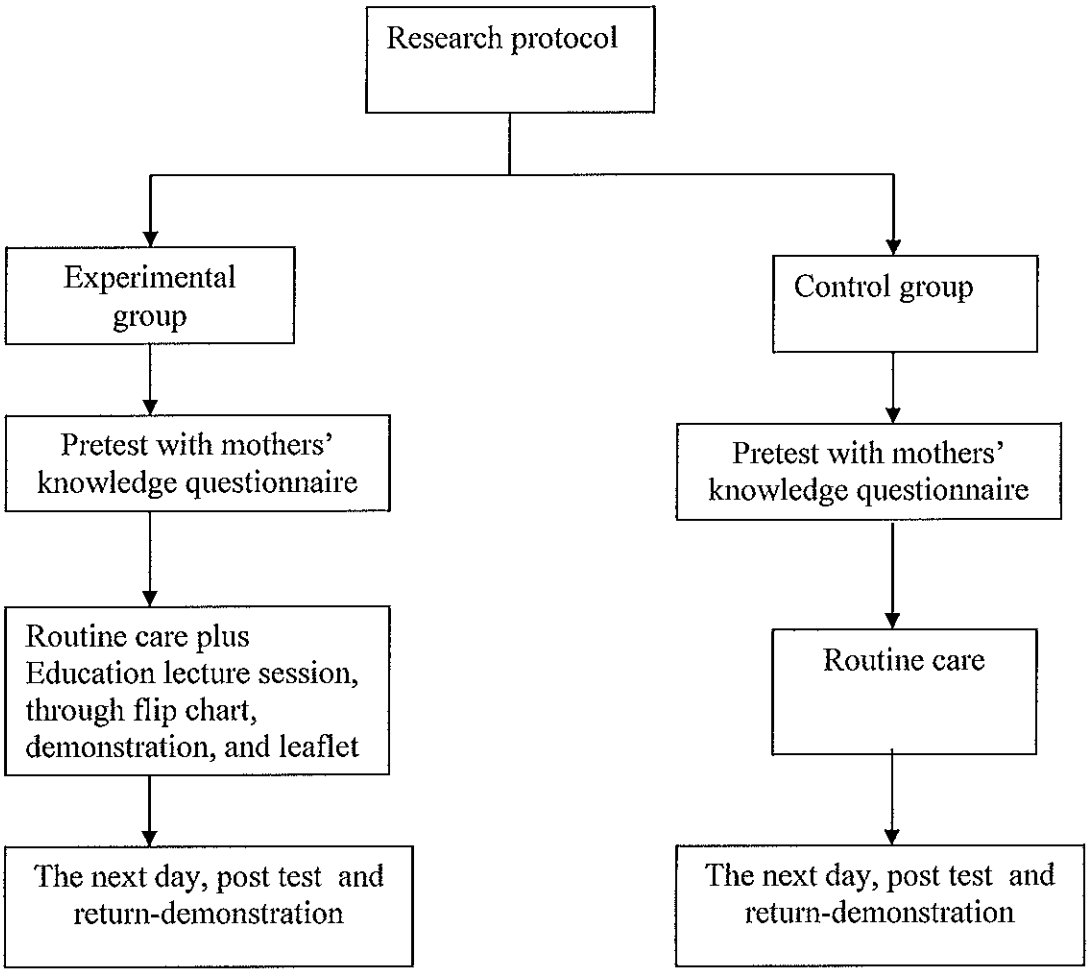

Figure 4

Research Protocol

CHAPTER 4

RESULTS AND DISCUSSION

Results

This quasi experimental research was designed to examine the effects of the educational program on child care knowledge and behaviors of mothers of children aged under five years with pneumonia. Results of the study were presented in three sections as followed: Subjects' demographic characteristics (mother and children); comparison of knowledge score within and between control and experimental group; and comparison of post-test mothers' behavior score between control and experimental group.

Subjects' Demographic Characteristics

A total of fifty mothers of pneumonia children who met the inclusion criteria were recruited. In the control group, the majority of mothers (88%) were in the age group of eighteen to twenty five with a mean age of 22.56 years (Table 1). All mothers were married, and almost half of them had one child (48%). Most of the mothers' religion was Islam (96%). Sixty eight percent of them had secondary educational background, 20% had primary level, and 12% had higher than secondary level. All of them were housewives. The monthly family income was within the range of 5001-10000 Taka or 72- 143 USD (44%). Fifty two percent of mothers had child care experience of pneumonia for less than one week.

In the experimental group, the majority of mothers (92%) were in the age of 18-25 years with a mean age of 22.20 years. All mothers were married and more than half of them had one child (56%). Most of the mothers' religion was Islam (96%) similar to the control group. Educational backgrounds were 20% in primary, 68% in secondary, and 12% in higher secondary or higher, which is similar to the control group. All of them were housewives and 48% had monthly family income within a range of 5001-10000 Taka or 72- 143 USD. Seventy two percent of the mothers had child care experience for less than one week.

The homogeneity of mothers' demographic data of both groups was tested by t-test and Fisher's Exact test. It was found that there was no statistically significant difference between the demographic characteristics of mothers in the control and experimental group, which in turn were homogenous in terms of mean age, marital status of mother, number of children, religion, level of education, occupation, income, experience of taking care, and knowledge of pneumonia.

Table 2 shows the demographic characteristics of pneumonia children both in the control and experimental group. In the control group, the majority of children age (72%) were in the group of > 2 - 12 months with the mean age of 3.79 months. Most of the children (68%) were male. Almost all children (96%) had stayed in hospital for less than 7 days (till first day of interview) which was 3.08 days in average. A large number of children (76%) had no other previous histories of pneumonia.

In the experimental group, the majority of children (52%) were in the group of > 2- 12 months with the mean age of 5.30 months. Most of the children (56%) were male. Almost all (96%) children had stayed in hospital for less than 7 days (till first

day of interview) which was 2.88 days in average. Eighty percent of the children had no other previous histories of pneumonia.

The homogeneity of children's demographic data of both groups was tested by t-test, Pearson Chi Square, and Fisher's Exact Test. Results showed that children's demographic characteristics were homogenous in terms of mean age, gender, duration of stay in the hospital, and previous history of pneumonia was tested by t-test, Pearson Chi squire, and Fisher's Exact Test (Table 2).

Table 1

Demographic Characteristics of Mothers both in the Control and the Experimental Group Presented by Frequency, Percentage, and Comparison Statistics (N = 50)

Characteristics	Control n	%	Experimental n	%	Statistics	*p* value
Age (years)					0.33[a]	.74
18- 25	22	88	23	92		
26-35	2	8	2	8		
36-45	1	4	0	0		
(Con: M = 22.56, SD = 4.28) (Exp: M = 22.20, SD = 3.29)						
Marital status					b	1.00
Married	25	0	25	100		
Number of children					3.67[c]	.29
One	12	48	14	56		
Two	8	32	9	36		
Three	5	20	1	4		
> Three	0	0	1	4		

Table 1 *(Continued)*

Characteristics	Control n	Control %	Experimental n	Experimental %	Statistics	*p* value
Religion					b	1.00
Islam	24	96	24	96		
Hindu	1	4	1	4		
Level of education					.14[c]	1.00
Primary	5	20	5	20		
Secondary	17	68	17	68		
Higher secondary or more	3	12	3	12		
Occupation					b	1.00
Housewife	25	100	25	100		
Income per month (Taka)					2.42[c]	.60
5000 or less	10	40	9	36		
5001-10000	11	44	12	48		
10001-15000	4	16	2	8		
>15000	0	0	2	8		
Experience of taking care of pneumonia children					2.42[c]	.19
< 1 week	13	52	18	72		
1 week -2 weeks	8	32	3	12		
> 2 weeks - 3 weeks	4	16	4	16		
Received health teaching regarding pneumonia previously					b	1.00
Not received	25	100	25	100		

Note:
a = t-test
b = No statistics are computed because the variables (marital status, occupation etc) are constant.
c = Fisher's Exact Test
M = Mean
SD = Standard Deviation
Con = Control
Exp = Experimental

Table 2

Demographic Characteristics of Pneumonia Children in the Control and the Experimental Group Presented by Frequency, Percentage, and Comparison Statistics (N=50)

Characteristics	Control n	%	Experimental n	%	Statistics	*p value*
Age					1.44[a]	.16
0 - 2 months	7	28	8	32		
> 2 - 12 months	18	72	13	52		
13 - 60 months	0	0	4	16		
(Con: M = 3.79, SD = 2.04) (Exp: M = 5.30, SD = 4.83)						
Gender:					.76[b]	.38
Male	17	68	14	56		
Female	8	32	11	44		
Duration of staying in the hospital					45 [b]	.66
< 7 days	24	96	24	96		
7 days or more	1	4	1	4		
(Con: M = 3.08, SD = 1.63) (Exp: M = 2.88, SD = 1.51)						
Previous history of pneumonia (admitted children)					3.12 [c]	.47
Never	19	76	20	80		
Once	5	20	2	8		
Twice	1	4	1	4		
> Twice	0	0	2	8		

Note:

a = t-test
b = Pearson Chi Squire
c = Fisher's Exact Test
$\bar{X}$ = Mean
SD = Standard Deviation
Con = Control
Exp = Experimental

Comparison of Knowledge Score Within and Between Control and Experimental Group

Table 3 shows that there was no statistically significant difference between pre-test and post-test of the mean knowledge score within the control group. In contrast, there was a statistically significant difference between pre-test and post-test of the mean knowledge score within the experimental group ($t = -6.45$, $p < .00$).

Table 3

Comparison of Mothers' Knowledge Score Within Control and Experimental Group (N = 50)

Mothers knowledge	Pre -test Mean	Pre -test SD	Post-test Mean	Post-test SD	t	df	*p* value
Control	24.12	4.82	25.04	5.81	- 1.70	24	.29
Experimental	26.40	5.89	34.64	3.86	- 6.45	24	.00

When compared the mothers' knowledge score between the control and the experimental group, the result showed that there was no significant difference between pre-test mean knowledge score of control and experimental group (Table 4). However, there was highly significant difference between the post-test of mothers' knowledge score of the control and the experimental group ($t = -6.88$, $p < .00$).

Table 4

Comparison of Mothers' Knowledge Scores Between the Control and the Experimental Group (N = 50)

Mothers' knowledge	Control (n=25) Mean	SD	Experimental (n=25) Mean	SD	t	df	*p* value
Pre-test	24.12	4.82	26.40	5.89	- 1.49	48	.14
Post-test	25.04	5.81	34.64	3.86	- 6.88	48	.00

Comparison of Mothers' Behaviors Scores Between the Control and the Experimental Group (Cumulative Scores of Post-Test)

The result shows that there was a highly significant difference between post-test score of cumulative behavior of the control and the experimental group ($t = -18.88$, $p < .00$) (Table 5).

Table 5

Comparison of Cumulative Scores of Post-Test Mothers' Behaviors Between the Control and the Experimental Group (N = 50)

Variable	Control (n=25) Mean	SD	Experimental (n=25) Mean	SD	t	df	*p* value
Mothers' behavior	6.64	2.23	17.68	1.89	-18.88	48	.00

When compared the mothers' behaviors post-test scores, the result showed that there was a highly significant difference in most behaviors between post-test score of behaviors of the control and the experimental group. The score of two behaviors, identifying chest indrawing and cleaning nose or airways were not statistically significant due to their initial higher score (Table 6).

Table 6

Comparison of Post-Test Mothers' Behaviors Scores between Control and the Experimental Group (N = 50)

Behavior	Control (N = 25) Mean	SD	Experimental (N = 25) Mean	SD	t	*p* value
Counting respiratory rate	.36	.91	2.76	.52	-11.46	.00
Identifying chest indrawing	1.52	.77	1.84	.37	-1.87	.07
Measuring body temp	.24	.72	3.16	.89	-12.66	.00
Providing tepid sponging	2.12	.97	5.60	.64	-14.92	.00
Cleaning nose or airway	.88	.33	.96	.20	-1.03	.31
Preparing suspension	1.52	.96	3.36	.95	-6.80	.00

Discussion

Discussion of the study findings is carried out in three parts. The first part focuses on characteristics of the mother and pneumonia children, and then the part of child care knowledge of mothers will be discussed. Lastly, mothers' behavioral practice is focused.

Characteristics of the Mothers and Pneumonia Children

Demographic characteristics of mothers both in the control and the experimental group were not statistically different in terms of age, marital status, number of children, religion, level of education, occupation, income, experience of taking care, and knowledge of pneumonia. In addition, children characteristics in both groups were also not significantly different in terms of range of age, gender, duration of stay in the hospital, and previous history of pneumonia in the last 12 months (Table 2). Thus, the demographic characteristics of both groups were homogenous. According to Polit and Beck (2008), they stated that if the groups are not equivalent, the difference of outcomes may result from initial differences or group differences rather than from the effect of the independent variables or treatment. From this point of view, the results of the educational program in this study with homogenous characteristics of the subjects in both groups were due to intervention rather than by chance or identified confounding variables.

Child Care Knowledge of Mothers

In overall, the educational program improves all relevant aspects of child care knowledge. The results showed that mothers, who had educational program, had highly statistical significance of knowledge than mothers who received only routine

care (Table 4). The highly significant knowledge gained in educational program might be due to the level of mothers' education. In this study, 68% of the mothers had secondary education level and 12% of the mothers had education level of higher than secondary level. Thus, these mothers had enough cognitive level to understand the context of pneumonia. In addition, methods and materials including flip chart and leaflet used in the program would help mothers to remember and recall information easily. Thus, when they were educated during educational session, they could recall information (knowledge) effectively. The flip chart used in the study was very attractive in design and color. Also, it contains simple descriptions, and meaningful related pictures that made the information clearer and understandable. Moreover, the length of teaching period for mothers' knowledge was only one hour. This short period of session was helpful for mothers to concentrate to the lesson. According to Swart (2004), the flip chart had great demand for a number of reasons such as; it was practical, visually appealing, and easily understood. It could be used effectively by a range of facilitators and in multiple settings. Moreover, providing leaflet containing information similar to flip charts to the participants and asked them to read the leaflet would help the mothers' repetition of sharing knowledge among peer and others, which in turn may help them retain knowledge information more permanently.

Child Care Behaviors of Mothers

The results of this study showed that mothers who had educational program had statistically significant higher behavior score than that of the control group ($p < .001$). Mothers of the experimental group gained highly significant behavior score because they were educated, demonstrated, and asked to do return-demonstration of how to care children. Also, during demonstration and return-demonstration, mothers

remained in active state of mind and concentration, which in turn made them remember all of the contents provided and could recall as needed during return-demonstration session. Furthermore, practicing with baby or doll as visual aids, would help the learner to understand clearly and memorize well, which is confirmed by the Duel Coding Theory (DCT). According to the DCT theory (Paivio, 1971), information (the logogens) provided verbally or by an object or picture (the imagens) are stored in the different part of brain simultaneously in the same time through an interconnectivity system, which in turn helped the learner understood clearly. Learning through demonstration is also supported by Social Learning Theory of Bandura (1977) that people can learn from observation of the action of others.

Interestingly, mothers' behavior score of identifying chest-indrawing and cleaning nose or airway was not significantly different between experimental and control group. Initially, before receiving educational program, most of the mothers could differentiate normal breathing and abnormal breathing. Also, most of them could clean nose or airway correctly. This finding was similar to the study of Stewart, Parker, Chakraborty, and Begum (1994), which reported that Bangladeshi mothers could recognize pneumonia. They could recognize the sign of severe pneumonia such as labored breathing, chest retractions.

The finding of this study was congruent with the previous studies. The study of Vu-T (2003) reported that providing educational program could help mothers improve both knowledge and practice regarding ARI. Vu-T suggested that giving more specific health education to the mothers regarding ARI could minimize preventable deaths in children. Also, Vitolo et al. (2008) found that there was a positive impact of educational program on nutrition for mothers, in reducing

respiratory symptom in infants during the first year of life. Mantango and Neuvians (1986) found that mothers' health educational program provided by village health workers could efficiently reduce the child mortality rates of ARI and other diseases. Furthermore, Lye, Nair, Choo, Kaur, and Lai (1996) found that health education of mothers on childhood pneumonia and training of health staff on case management effectively reduced severe ARI. In summary, previous studies reported that providing health education to mothers related to acute respiratory infection could effectively reduce the rate of acute respiratory infection.

Control Group

Results of mothers' knowledge questionnaire showed that subjects in the control group had post-test score higher than pre-test score (Table 3). The change between pre-test and post-test scores was very little and statistically not significant. This change might be by chance or due to sharing idea among subjects in between pre-test and post-test.

In summary, providing educational program improves child care knowledge and behaviors of mothers in taking care of the child with pneumonia. Nurses need to use educational program using flip chart and leaflet in order to teach mother to improve their knowledge of pneumonia. In addition, using demonstration method can effectively increase mothers' child care behavior or their ability to take care of their children with pneumonia.

CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

Conclusion

A quasi experimental study with two groups, pretest-posttest design, was conducted in a pediatric ward at Dhaka Medical college Hospital, Bangladesh, from December, 2009 to February, 2010. It was aimed to examine the effects of the educational program on child care knowledge and behaviors of mothers of children aged under five years with pneumonia. Fifty subjects were recruited which were equally divided into 25 for the control group and 25 for the experimental group. The control group received routine care while the experimental group received educational program. The instruments of this study consisted of Mothers' Knowledge Questionnaire and Behavioral Checklist for data collection. Flip chart, leaflet, and medical equipments and dolls were used to teach the mothers. Three teaching techniques or methods including lecture and discussion, demonstration, and return-demonstration were used in order to guide the subjects for good understanding of the contents of the program. Descriptive statistical analysis including frequency, percentage, means, and standard deviation were used to describe the subjects' demographics. Pearson Chi Squire Test and Fisher's Exact Test were used to test the homogeneity of demographic data. T-tests were used to investigate the mean difference of knowledge and behaviors between and within control and experimental groups.

The results showed that there were highly statistically significant difference between pretest (M = 26.40) and post-test (M = 34.64) mean knowledge scores of the

experimental groups ($p < .00$). Also, the mean difference of post test knowledge score of control group (M = 25.04) and experimental group (M = 34.64) were highly significant ($p < .00$). In addition, subjects in the experimental group had higher level of behavior score (M = 17.68) than the control group (M = 6.64) ($p < .00$).

Recommendations

The study showed that pneumonia educational program can help increasing both knowledge and behaviors of mothers of children aged under five years in the management of pneumonia. Thus, this educational program helps mothers to know new information, which in turn help mothers to remove their misperceptions and also lead them to provide care effectively and correctly.

Nursing Practice

For nursing practice, nurses can use this educational program, including its method and materials, in order to teach mothers how to take care of children with pneumonia. It is worth to repeat the session more than one day for better understanding and more permanent learning. For measuring body temperature, it was difficult for some mothers to read/identify the temperature level in thermometer. Emphasis should be given in this area when teaching/demonstrating of measuring body temperature. In the future, if educational program is conducted in the hospital or community settings, the gap between pretest and post-test should be more than one day, for better outcome evaluation. In hospital settings, sometimes early discharge causes high attrition, thus, discharge planning at the beginning of admission should be arranged to ensure that every mother of pneumonia children join in the educational program completely.

Nursing Education and Research

In Bangladesh, the educational program offered by nurses is absent or rarely existed at this moment. This study provides an example of the structured educational program for nurses as well as other health care providers in Bangladesh. The nurses will get a clear concept about structured educational program from this study. By the researcher's experience, perception of most nurses on health education is only providing some information. In the future, this study will serve as a pioneer of health educational research for bachelor students and master students for further conducting of other health educational researches, not only in the clinical settings but also in the community settings.

Strengths and Limitations of the Study

Strengths of this study were that the demographic data of both the control and experimental group were homogenous. Thus the results of this study were not influenced by others independent variables. In addition, subjects in this study were highly motivated by the researcher to join the educational program, which in turn helped them to participate more and learn easily and quickly. Flip chart and leaflet were also enriched with colorful picture which made the mothers understand the topic clearly. Finally, demonstration in a real situation with dolls and real medical equipments, such as thermometer helps mothers to respond positively and remembers easily.

The limitations in this study were noted, such as classroom environment was not silent. Thus, mothers' concentration might have been distracted from noise during education. Besides, health care professional and relatives sometimes called

participants for some reasons, which would distract them from education as well. In addition, there was no other data collectors beyond researcher to score in checklist for behavior observation, researcher himself observed behaviors and scored in the checklist. There was a possibility of biasness in scoring if intervention (giving education) and data collection (scoring in checklist) were both done by the researcher. However, the researcher tried his best to remain bias-free.

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APPENDICES

APPENDIX A

INFORMED CONSENT FORM

Study title: Effect of educational program on child care knowledge and behaviors of Mother of children aged under five years with pneumonia.

Investigator: Mohammed Maud Parvez.

My name is Mohammed Masud Parvez, a master's student, Faculty of Nursing, Prince of Songkla University, Thailand. I am conducting a study entitled "the effect of educational program on child care knowledge and behaviors of Mother of children aged under five years with pneumonia." The purpose of this study is to examine the effectiveness of educational program on pneumonia.

You are requested to participate in the study by (1) to respond some question, (2) attend a session of class estimated time 1 hour, which provide you information about pneumonia. The study procedure involves no foreseeable risk or harm to you or your child. A code number will be used for your name so that your identity and information will not be discovered. All information and your responses in connection with this study will remain confidential. Only the researcher and advisors are eligible to access the data. Neither your name nor any identifying information will be used in the report of the study.

The information gather will be used to write a research report which perhaps will help in the promotion of further educational program, and help to strengthen the further educational program.

Your participation in this study is voluntary and will not payable to join in the study. There is no fund to pay for participants. You have the right to participate or not to participate. You also have the right to withdraw at any time and your willing or unwilling withdraw will not result in any penalty.

Lastly, signature in this letter indicates that you understand what is involved and your consent to participate in this study. You are free to join the session and ask any question about the study or being a subject. If you have free time, please feel free to contact me by phone or letter.

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Name of participant	(sign of the participant)	(date)
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Name of researcher)	(sign of researcher)	(Date)

If you have any question please contact:

Mohammed Masud Parvez.
Baitul Arif, Hasan Lane,
Datta Para, Tonghi, Gazipur.
Phone- 02-9811041

Master of nursing science
Faculty of nursing.
PSU, Hat Yai, Thailand.
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APPENDIX B

MOTHERS KNOWLEDGE QUESTONNAIRE

Code.....

Date.....

Time.....

Introduction: This instrument is divided into three parts. Part 1 is a Mother's Demographic Data, part 2 is Child's Demographic Data, and part 3 is Mother's Knowledge Question.

Part 1: Mother's Demographic Data

Instruction: Please make a mark "□√" or fill in the blank at each question as accurately as possible.

1. Age: .....years
2. Marital status
   - □ Married
   - □ Divorced
   - □ Widowed
3. Number of children in your family
   - □ One
   - □ Two
   - □ Three
   - □ More than three (please specify).....
4. Religion
   - □ Islam
   - □ Christian
   - □ Hindu
   - □ Buddhist
5. Level of education
   - □ None
   - □ Primary
   - □ Secondary
   - □ Higher secondary (12 level) or more
6. Occupation
   - □ Housewife
   - □ Government job
   - □ Garments worker
   - □ Others (please specify) .....
7. Income per month (currency in Taka)
   - □ 5000 or less
   - □ 5001-10000
   - □ 10001-15000
   - □ >15000

8. Experience of taking care of pneumonia children (total duration of taking care)

□ < 1 week □ 1 week -2 weeks

□ > 2 weeks- 3 weeks

9. You received health teaching relating to pneumonia before

□ Received □ Did not received

Part 2: Child's Demographic Data

Instruction: Please tick "□√" or right on the appropriate section.

1. Age: .....days.....months.....years
2. Gender:

   □ Male □ Female
3. Duration of staying in the hospital .....days
4. Previous history of pneumonia attack within a year (last 12 month)

   □ Once □ Twice

   □ Others (please specify) .....

Part 3: Mother's Knowledge Question.

Please circle "T" if the answer is correct or circle "F" if the answer is incorrect

(Example: Formula feeding provides same benefit as breast feeding for children. T. (F))

Question	Options	
1. Pneumonia is a disease associated with infections of the abdomen	T	F
2. Pneumonia is caused by organisms such as bacteria, virus, and fungus	T	F
3. Cold foods can cause pneumonia	T	F
4. Evil eyes and evil winds can cause pneumonia	T	F
5. Parent's smoking near children increases the risk of incidence of pneumonia in children	T	F
6. Household smoke from burning wood or coal is not harmful for pneumonia in children	T	F
7. Over crowding in sleeping areas are associated with an increased incidence of pneumonia in children	T	F

8. Malnutrition decreases the risk of pneumonia in children	T	F
9. For checking nutritional status of your child, you should contact with doctor or health worker	T	F
10. For children age less than 2 months, pneumonia can be classified as no pneumonia, severe pneumonia, and very severe disease	T	F
11. For children age 2 months to 5 years, pneumonia can be classified as pneumonia and severe pneumonia	T	F
12. Cough or cold but no fast breathing and no chest indrawing are the signs and symptoms of no pneumonia	T	F
13. Cough or cold with fast breathing, but no chest indrawing is the sign and symptoms of pneumonia	T	F
14. The child has chest indrawing if the lower chest wall moves out and the upper chest wall moves in	T	F
15. When your child has cough or cold with fast breathing and chest indrawing, it indicates that the child is suffering from severe pneumonia	T	F
16. If your child suffers from cough or difficult breathing with danger signs, it means that s/he is suffering from very severe disease	T	F
17. Running nose is a danger sign of pneumonia	T	F
18. Cyanosis, convulsions, inability to drink, or stridor in a calm child are the danger signs of pneumonia	T	F
19. Stridor means a harsh noise when the child breaths in	T	F
20. Wheezing means a soft musical noise when child breathing out	T	F
21. For children less than 2 months of age, fast breathing is considered as respiratory rate less than 60 per minute	T	F
22. For children 2 to 12 months of age, fast breathing is considered as respiratory rate 50 or more per minute	T	F
23. For children 13 to 60 months of age, fast breathing is considered as respiratory rate 40 or more per minute	T	F
24. No pneumonia can be treated at home with doctor's advice	T	F
25. The child should be hospitalized if he/she has danger sign of	T	F

pneumonia		
26. You can discontinue giving medication to the child after 3 days of starting the medication	T	F
27. When your child feels better you can discontinue to giving the medication to the child	T	F
28. Antibiotics are used to treat or prevent the infection caused by bacteria	T	F
29. Herbal medicine can not use conjugally with allopathic treatment	T	F
30. Sole use of herbal medicine may not cure your child from pneumonia and sometimes may make worsen the disease (pneumonia)	T	F
31. It is not necessary to give the medicine in right dose and right time when giving medication to your child	T	F
32. One medicine spoon full contains 2 ml	T	F
33. Fifteen drops from medicine dropper equal to 1 ml of medicine	T	F
34. Normal body temperature ranges from 97°-100°F	T	F
35. The child needs tepid sponging if he/she has high fever	T	F
36. Breastfeeding during the age of 4-6 months does not reduce the incidence of pneumonia	T	F
37. Formula feeding is better than breastfeeding	T	F
38. Breastfeeding should be continued if your child has pneumonia	T	F
39. You should decrease breast feeding if your child has pneumonia	T	F
40. Foods and liquid drinks should be increased during the illness and during the recovery phase from pneumonia	T	F
41. Routine immunization increases the risk of pneumonia	T	F
42. You can avoid/limit the spreading of germs by hand washing	T	F
43. Covering mouth during coughing and sneezing can not limit the spreading of germs	T	F
44. Keeping your child away from people who have common cold or flu, helps to avoid/limit the spreading of germs	T	F

APPENDIX C

BEHAVIORAL CHECKLIST

Instruction: Check response by putting "1" for correct behavior and "0" for incorrect behavior in the right sided columns (researcher note).

Activities	Correct (1 score)	Incorrect (0score)
1.0. Counting respiratory rate 1.1 Count respiration full 1 minute (60 seconds) 1.2 Count respiration one inhalation plus one exhalation together as one respiration 1.3 Count respiration when the child is calm 2.0. Identifying chest indrawing 2.1 Observe chest indrawing during inspiration 2.2 Mother can identify (can explain when demonstrate) that, the child has chest indrawing if the lower chest wall goes in but upper chest wall and abdomen move out during the child breathes in. 3.0 Measuring body temperature 3.1 Check mercury level before apply and shake if necessary 3.2 Can place the valve of thermometer in the mid position of axilla. 3.3 Measure full 2 minutes (120 seconds) in axilla 3.4 Can read the level of temperature in Fahrenheit scale of thermometer. 4.0 Providing tepid sponging 4.1 Mixed cold and hot water in a bowl to make it lukewarm 4.2 Checked by using hand for appropriate temperature of water before applying. 4.3 Gently apply sponging on the forehead, the axilla or armpits and the groin area. 4.4 Then carefully wipe the patient's extremities (for about 5 minutes) 4.5 Then proceed with back area and buttocks (for about 5-10 minutes). 4.6 After sponging, check temperature for response to the sponging. 5.0 Cleaning nose or airway: Mother can clean nasal orifice by removing secretion with soft cloth or tissue paper. 6.0 Preparing suspension (Measuring fluid amount) 6.1 Can measure 15 drops as I ml of medicine by using medicine dropper. 6.2 Can measure 5 ml = 1 full spoon by using medicine spoon and syringe. 6.3 Can add total amount of solvent need to mix (as 5 full spoon = 30 ml) 6.4 Shaking bottle after mixing solvent.		
Total score		

APPENDIX D

Sample Size Estimation

Sample size was estimated by using data from the study of Ahmed (2008).

$$ES = \frac{\overline{X}_1 - \overline{X}_2}{SD_P} = \frac{68.73 - 40.00}{7.80} = 3.86$$

$$SDp = \frac{(SD_1)^2 + (SD_2)^2}{2} = \frac{(8.80)^2 + (6.667)^2}{2} = \sqrt{60.94} = 7.80$$

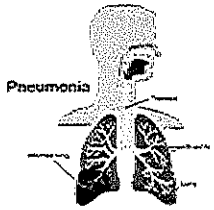
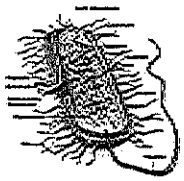
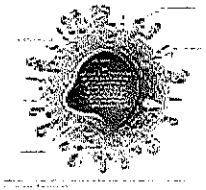
Effect size (ES) 3.86 is to large, so researcher would like to use ES values of .80

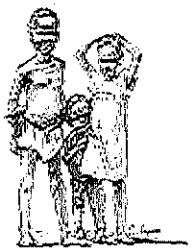
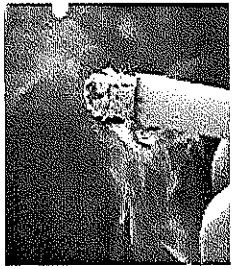
Expected Alpha (α) =.05, Expected power =.80, thus, approximate sample size in each group = 25

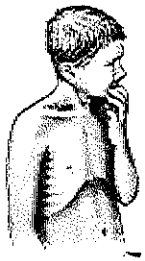
(Polit & Beck, 2008)

APPENDIX E

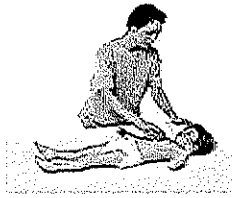
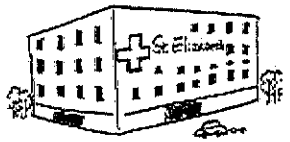
TEACHING PLAN

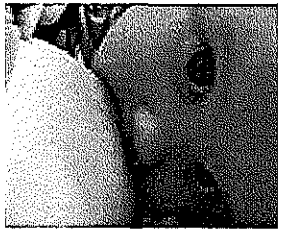
Objective	Content	Teaching learning activity	Media	Evaluation
1. After completion of this session, mother will be able to define pneumonia  	1. Definition of pneumonia: Pneumonia is an acute illness of lung parenchyma, usually caused by infection, and in which child is affected with fever, cough and difficulty in breathing associated with an increased respiratory rate. As pneumonia progress to severe pneumonia child will show the symptom of lower chest wall indrawing or collapse, which requires hospitalization.	1. Lecture and Discussion	1. Flip chart	1. Formative/ (Asking question) and Summative (Through close ended questionnaire)
2. After completion of this session, mother will be able to describe the causes of pneumonia  Bacteria  Influenza virus	2. Causes of pneumonia Pneumonia is always caused by infection of various organisms known as bacteria, virus, and fungi. Pneumonia never occurred - if mother or child take cold foods - Due to evil eyes - Evil wind - Evil spirit	2. Lecture and Discussion	2. Flip chart	2. Formative/ (Asking question) and Summative (Through close ended questionnaire)

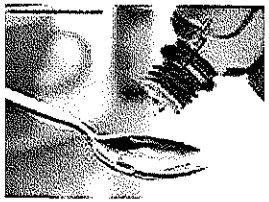
Objectives	Content	Teaching learning activity	Media,	Evaluation
3. After completion of this session, mother will be able to understand the risk factor associated with occurrence of pneumonia  Overcrowding  Malnutrition  Smoking  Cooking by wood	**3.** Risk factor related to occurrence of pneumonia: Cigarette smoking by parents near children has been associated with an increased incidence of acute respiratory diseases in childhood. Household smoke from burning wood, coal, or kerosene is harmful for children and can cause childhood respiratory disease Overcrowding in sleeping areas has been associated with an increased incidence of acute respiratory diseases in childhood Child with malnutrition is at risk of pneumonia. Contact with doctor or health worker to check your baby's nutritional status.	3. Lecture and Discussion,	3. Flip chart	3. Formative/ (Asking question) and Summative (Through close ended questionnaire)

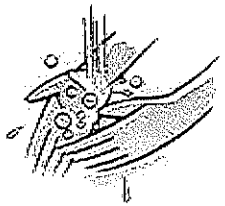
4. (a) After completion of this session, mother will be able to classify pneumonia 4. (b) After completion of this session, mother will be able to identify the signs and symptoms of pneumonia.  Chest retraction	4. (a & b) Classification and signs symptoms of pneumonia : WHO classify pneumonia as: **For children below 2 months**, pneumonia is classified into three groups: no pneumonia, severe pneumonia, and very severe disease. • No pneumonia is described as the child only has cough or cold but no fast breathing (less than 60 per minute) and no chest indrawing. • Severe pneumonia is described as child with fast breathing (60 per minute or more) and severe chest in drawing. • Very severe disease is described as child with, stopped feeding well, convulsions, abnormally sleepy or difficult to wake, stridor in calm child, wheezing and fever or low body temperature **For children aged 2 months to 5 years**, pneumonia is classified into four groups: no pneumonia, pneumonia, severe pneumonia, and very severe disease. • No pneumonia is described as child only has cough or cold but no fast breathing and no chest indrawing. • Pneumonia is described as child has cough or cold with fast breathing but no chest indrawing.	4. (a & b) Lecture and Discussion	4. (a & b) Flip chart	4. (a & b) Formative/ (Asking question) and Summative (Through close ended questionnaire)

	• Severe pneumonia is described as child has cough or cold with fast breathing and chest indrawing. • Very severe disease is described as child with stopped feeding well, convulsions, abnormally sleepy or difficult to wake, stridor in calm child, or severe under nutrition Fast breathing indicates: • 60 per minute or more for less than 2 months • 50 per minute or more for 2- 12 month • 40 per minute or more for 13- 60 month Chest indrawing: The child has chest indrawing if the lower chest wall goes in but upper chest wall and abdomen move out during the child breathes in. In normal respiration, when the child breathes in the upper and lower chest wall, and abdomen move out together. Stridor: Stridor is a harsh noise when the child breaths in. Wheezing: Wheezing is a soft musical noise when child breathing out or shows signs that breathing out is difficult.			

4. (c) After completion of this session, mother will know about the danger signs of pneumonia  Convulsion	4. (c) Danger signs of pneumonias are : Cyanosis, convulsions, abnormally sleepy/difficult to wake, stridor in a calm child, inability to drink, severe clinical malnutrition (Ashraf et al, 2008).  Cyanosis	4. (c) Lecture and Discussion,	4 (c). Flip chart	4. (c) Formative/ (Asking question) and Summative (Through close ended questionnaire)
5 (a). After completion of this session, mother will be able to decide where they treat their children, when child got pneumonia.  **hospital**	5 (a). Treatment decision: Mild or no pneumonia need treatment but can be treated at home with doctor's advice or prescription. Severe pneumonia or very severe disease or the child have danger sign of pneumonia; should hospitalize as early as possible and is not safe to treat at home.	5 (a). Lecture and Discussion	5 (a). Flip chart	5. (a) Formative/ (Asking question) and Summative (Through close ended questionnaire)

5. (b) After completion of this session, mother will be able to know about care during pneumonia.  **breastfeeding**  Enough liquid	5. (b) Care for the child with pneumonia: • Clean and keep the airway clear. • Measure body temperature; give tepid sponging if fever is high. Normal body temperature is 97-99°F • Keep your baby away from smoke, dust, and fumes • **Give a healthy diet**: Good nutrition can help the body to fight against illness. Give variety of healthy foods every day. Diet should include fruits, vegetables, breads, and proteins (such as chicken, fish, and beans) for children who started weaning foods. • **Breast-feeding:** Breast-feeding during the first 4-6 months of life is associated with a reduced incidence of pneumonia and bronchiolitis as compared to formula feeding. During ARI, breast-feeding should be continued, should not be stopped or decreased. • **Give enough liquids**: Give enough liquids to drink every day. This helps to keep air passages moist and better able to get rid of germs and other irritants. • Quantity of food and liquids taken during the illness and during the recovery phase from ARI should be increased.	5. (b) Lecture and Discussion	5 (b). Flip chart	5. (b). Formative/ (Asking question) and Summative (Through close ended questionnaire)

5 (c). After completion of this session, mother will know about preparing and measuring of syrup/ suspension/solution.  **Medicine**  **Dropper**  **Medicine Spoon**	5 (c). **Medication:** Medicines, when used correctly, may help your child feeling better. **Antibiotic:** Doctor may prescribe antibiotic to fight or prevent the infection caused by bacteria. Continue medicine as long as doctor's advice. Not stop the medicine before full fill the course even your child feels better. **Cough medicine:** Doctor may prescribe cough medicine to loosen the cough. **Traditional and herbal medicine:** There are some traditional and herbal medicine such as, juice of basil leaf, honey, and mastered oil etc. You can use this conjugally with allopathic treatment. Sole use of this medication may not cure your baby and sometimes may make worsen the disease and even leads to serious consequence. **Measuring and preparation of medication:** Keep in mind: One tea spoon full = 5ml One ml = 15 drops. Add amount of water (distilled/ supplied with syrup/ cool boiled water) instructed in the packet or label of bottle in case of powder syrup, to make it ready for giving your child. Shake bottle before giving it. When give your child medication, you should follow:	5 (c). Lecture and Discussion	5 (c). Flip chart	5 (c). Formative/ (Asking question) and Summative (Through close ended questionnaire)

6. After completion of this session, mother will be able to know how to prevent pneumonia.  Vaccine  **Hand-washing**	• Right time • Right medicine • Right dose (quantity) 6. How to prevent pneumonia: **Vaccines:** Routine immunizations decrease the risk of pneumonia. Take your child to immunization centre to get vaccine **Avoid spreading germs through:** - Wash your hands often with soap and water. - Do not touch your baby's eyes, nose, or mouth unless you have washed your hands first. - Always cover your mouth during coughing and sneezing. Use tissue, handcar chip, or cloth rather than your hand. People around your baby should also cover their mouths when they cough. - Try to avoid taking your child to the child or people who have a cold or the flu. If your baby is sick, stay away from others as much as possible	6. Lecture and Discussion	6. Flip chart	6. Formative/ (Asking question) and Summative (Through close ended questionnaire)

 No **Smoking"**	**Quit smoking and avoid overcrowding.** Do not smoke, and do not allow others to smoke around your child. Smoking increases risk of lung infections and other health problems. Smoking also makes harder for your baby to get better after being ill. Try to quit house hold smoke such as avoid wood or coal burner, kerosene stove and kerosene light etc. Try to avoid many persons sleeping in a congested room. **Room and space calculations**: (Children under one year old are ignored; children over one and under ten years old count as a half) • floor area 50-69 square feet = 0.5 people can sleep there • floor area 70-89 square feet = 1 person can sleep there • floor area 90-109 square feet = 1.5 people can sleep there • Floor area 110 square feet = 2 people can sleep there.			

APPENDIX F

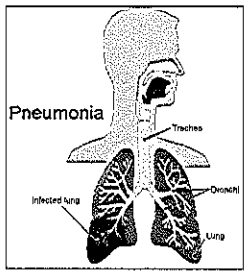
DEMONSTRATION PLAN

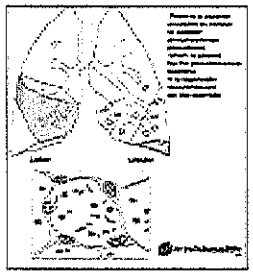
Objective	Content	Teaching learning activity	Time	Media	Evaluation
1. After completion of this session, mother will be able to demonstrate counting respiratory rate.	**1. Counting respiratory rate** 1.1 Count respiration full 1 minute (60 seconds) 1.2. Count respiration one inhalation plus one exhalation together as one respiration 1.3. Count respiration when the child is calm	1. Lecture and demonstration	5 minutes	Real baby	1. Return demonstration
2. After completion of this session, mother will be able to Identify chest indrawing	**2. Identifying chest indrawing** 2.1. Observe chest indrawing during inspiration 2.2. Mother can identify (can explain when demonstrate) that, the child has chest indrawing if the lower chest wall goes in but upper chest wall and abdomen move out during the child breathes in.	2. Lecture and Demonstration	5 minutes	2. Real baby and picture of chest indrawing	2. Return demonstration
3. After completion of this session, mother will be able to measuring body temperature	**3. Measuring body temperature** 3.1. Check mercury level before apply and shake if necessary 3.2. Can place the valve of thermometer in the mid position of axilla. 3.3. Measure full 2 minutes (120 seconds) in axilla 3.4. Can read the level of temperature in	3. Lecture and Demonstration	10 minutes	3. Thermometer, real baby, and doll	3. Return demonstration

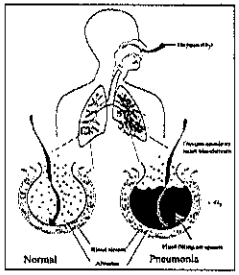
	Fahrenheit scale of thermometer.				
4. After completion of this session, mother will be able to providing tepid sponging	**4. Providing tepid sponging** 4.1. Mixed cold and hot water in a bowl to make it lukewarm 4.2. Checked by using hand for appropriate temperature of water before applying. 4.3. Gently apply sponging on the forehead, the axilla or armpits and the groin area. 4.4. Then carefully wipe the patient's extremities (for about 5 minutes) 4.5. Then proceed with back area and buttocks (for about 5-10 minutes). 4.6. After sponging, check temperature for response to the sponging.	4. Lecture and Demonstration	15 minutes	4. Doll and sponging materials as bowl, water, towel etc.	4. Return demonstration
5. After completion of this session, mother will be able to cleaning nose or airway	**5. Cleaning nose or airway** 5.1. Mother can clean nasal orifice by removing secretion with soft cloth or tissue paper.	5. Lecture and Demonstration	3 minutes	5. Real baby, doll, and soft clean cloth	5. Return demonstration
6. After completion of this session, mother will be able to preparing suspension (Measuring fluid amount)	**6. Preparing suspension (Measuring fluid)** 6.1. Can measure 15 drops as I ml of medicine by using medicine dropper. 6.2. Can measure 5 ml = 1 full spoon by using medicine spoon and syringe. 6.3. Can add total amount of solvent need to mix (as 5 full spoon = 30 ml) 6.4. Shaking bottle after mixing solvent.	6. Lecture and Demonstration	8 minutes 14 minutes For feed back.	6. Dropper, medicine spoon, syringe, water, and bottle.	6. Return demonstration

APPENDIX G (Leaflet)

Pneumonia

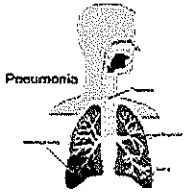


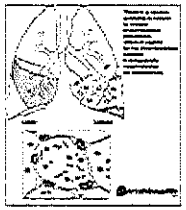




A leading killer

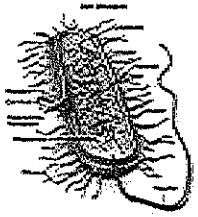
1. What is pneumonia?



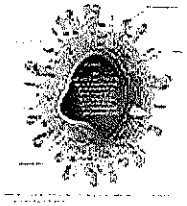


Ans: Pneumonia is an acute illness of lung parenchyma, usually caused by infection.

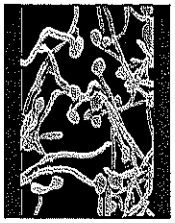
2. Causes of pneumonia:



Bacteria



virus



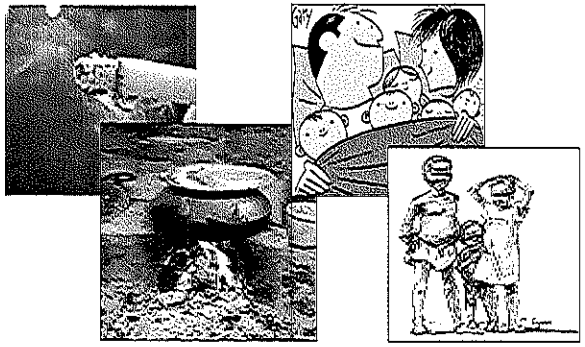
fungus

 Pneumonia is always caused by infection of various organisms known as bacteria, virus, fungi or other types of organism.

Pneumonia never occurred
- if mother or child take cold foods
- due to evil eyes, evil spirit, wind etc.

3. Factor related to pneumonia:

- Cigarette smoking near children
- Household smoke from burning wood, coal, etc
- Over crowding in sleeping areas
- Children with malnutrition



4. Classification and sign symptom of pneumonia:

a.) For children below 2 months of age, pneumonia is classified into three groups:

- No pneumonia: only cough and cold
- Severe pneumonia: fast breathing and chest indrawing
- Very severe disease: stopped feeding well, convulsions, abnormally sleepy, stridor in calm child, very high or very low body temp.

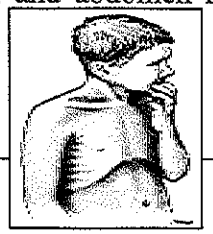
For children aged 2 months to 5 years, pneumonia is classified into four groups:

- No pneumonia: only cough or cold
- Pneumonia: cough or cold with fast breathing but no chest indrawing.
- Severe pneumonia: cough or cold with fast breathing and chest indrawing.
- Very severe disease stopped feeding well, convulsions, abnormally sleepy or difficult to wake, stridor in calm child, or severe under nutrition

 Fast breathing means when breathing-

- 60 per minute or more for less than 2 month of age.
- 50 per minute or more for 2- 12 month
- 40 per minute or more for 13- 60 month of age.

 Chest indrawing: if the lower chest wall goes in but upper chest wall and abdomen move out during the child breathes in. In normal respiration, when the child breathes in the upper and lower chest wall, and abdomen move out together.



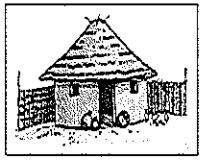
 Stridor: Stridor is a harsh noise when the child breaths in.

 Wheezing: Wheezing is a soft musical noise when child breathing out or shows signs that breathing out is difficult.

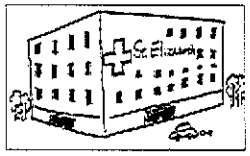
 Danger signs of pneumonias:
Cyanosis, convulsions, abnormally sleepy or difficult to wake, stridor in calm child, inability to drink, severe clinical malnutrition (Ashraf et al, 2008).

5. **Treatment decision:**

Pneumonia (mild) need treatment but can be treated at home with doctor's /medical advice.



Severe or very severe pneumonia or the child have danger sign of pneumonia; should visit doctor or hospital and is not safe to treat at home without medical supervision.



6. **Care during pneumonia:**

 Clean airway or nostrils

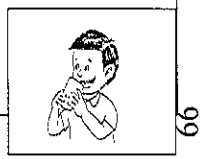
 Measure body temperature, tepid sponging if temperature is high. Normal body temp is ranged from 97-99^{0F}

 Keep your baby away from smoke, dust, and fumes

 Give variety of healthy foods every day. Diet should include fruits, vegetables, breads, and protein (such as chicken, fish, and beans) for children who started weaning foods.

 Breast-feeding: During ARI, breast-feeding should be continued, should not be stopped or decreased.

 Give enough liquids: Give enough liquids to drink every day.



Medication:

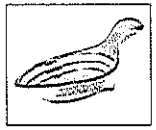
Antibiotic: Doctor may prescribe antibiotic to fight or prevent the infection caused by bacteria. Continue medicine as long as doctor's advice.

Cough medicine: Doctor may prescribe cough medicine to loosen the cough.

Traditional and herbal medicine: There are some traditional and herbal medicine such as, juice of basil leaf, honey, and mastered oil etc. You can use this conjugally with allopathic treatment.

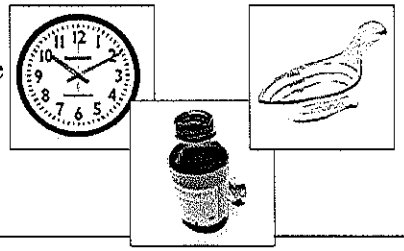
7. Preparation and measuring medication

Keep in mind:
One spoon full = 5ml
One ml = 15 drops



Add amount of solvent as instructed in the packet or label of bottle in case of powder syrup, to make it ready for giving your child. Shake bottle before giving. You should have to follow :

Right time
Right medicine
Right amount

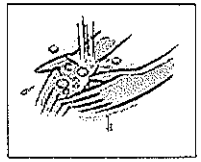


9. How to prevent pneumonia:

Vaccines: Routine immunizations decrease the risk of pneumonia.

Prevent spreading germs through:

- Wash your hands often with soap and water.
- Do not touch your baby's eyes, nose, or mouth unless you have washed your hands first.

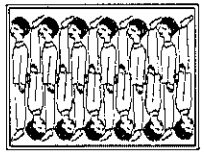


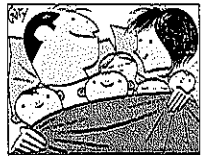
- Always cover your mouth during coughing and sneezing.
- Do no taking your child to the child or people who have a cold or the flu.

Quit smoking: Do not smoke, and do not allow others to smoke around your child.

Try to quit house hold smoke such as avoid wood or coal burner.

Try to avoid many persons sleeping in a congested room.





Room and space calculations:

(Children under one year old are ignored; children over one and under ten years old count as a half)

Floor area 50-69 square feet = 0.5 people can sleep there. Floor area 70-89 square feet = 1 person can sleep there. Floor area 90-109 square feet = 1.5 people can sleep there. Floor area 110 square feet = 2 people can sleep there.

APPENDIX H

LIST OF EXPERTS

Three persons were examined the content validity of the instruments.

1. Dr. Busakorn Panthmetharith, Ph.D., RN.

   Assistant Professor, Depertment of Pediatric Nursing, Prince of Songkla University, Thailand.

2. Dr. Kaitsara Sen-ngam, Assistant Professor, Ph.D., RN.

   Assistant Professor, Depertment of Pediatric Nursing, Prince of Songkla University, Thailand.

3. Dr. M. A. Heye, MBBS, MCPS,

   Pediatric Consultant, Bangladesh Seikh Mujib Medical University.

VITAE

Name Mohammed Masud Parvez

Student ID 511042079

Educational Attainment

Degree	Name of institution	Year of Pass
Diploma in Nursing	NI, CMCH	1993
Diploma in Orthopedic Nursing	NI, CMCH	1994
Bachelor in Public Health Nursing	College of Nursing	2005

Scholarship Awards during Enrollment

Government of Peoples Republic of Bangladesh

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