PNEUMONIA MANAGEMENT PROGRAM FOR PARENTS OF CHILDREN UNDER 5 YEARS OLD: EVIDENCE - BASED NURSING

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ABSTRACT

Pneumonia is the leading cause of illness and death for under 5 year old children in Bangladesh and many other countries in the world. This study aimed to summarize related evidence in regard to educational programs about pneumonia management to improve knowledge and skill in caring for children with pneumonia and make a conclusion based on recommendations from the evidence. The related evidence published from 2010-2014, in English, was searched from Mahidol University electronic databases. Searching for evidence was conducted by using the PICO (Population, Intervention, Comparison and Outcome) framework. Three quasi-experimental studies, one pre-experimental study and one international guideline were included in this study. The educational programs about pneumonia management were frequently delivered in the hospitals. The methods of the educational programs were lecture, group discussion, role play, demonstration and return demonstration provided by nurses, booklets, flipcharts, leaflets, and posters. The contents consisted of the nature of the disease, management and care, immunization, nutrition, preventing dehydration, management of fever, medication administration and follow up appointment etc. The outcome measurement tools used were questionnaires, multiple choice questions, observational checklists, and 3-point practice scales. Findings from the evidence support the view that educational programs about pneumonia management are effective for parents of children under 5 years old to improve knowledge and skills in caring for children with pneumonia.

It is recommended that the pneumonia management program should be developed and implemented to suit the clinical practice context of Bangladesh. Further research to evaluate the effectiveness of pneumonia management programs is also recommended.

KEY WORDS: CHILDHOOD PNEUMONIA/ PNEUMONIA MANAGEMENT PROGRAM/ EVIDENCE-BASED NURSING

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CHAPTER I
INTERDUCTION

1.1 Background and significance of the study

Childhood pneumonia is an important cause of death in children under 5 years old. Approximately 156 million new childhood pneumonia cases are reported per year globally. In developing countries, it has been estimated that 151 million new childhood pneumonia cases occur each year (Rudan, Boschi-Pinto, Biloglav, Mulholland & Campbell, 2008). The predicted number of new childhood pneumonia cases was 7.84 million in the US. and 60.95 million in South East Asia each year. India, China, Pakistan, Bangladesh, Indonesia and Nigeria are the top five countries with high numbers of new childhood pneumonia cases. The predicted number of new childhood pneumonia cases per year in these countries was 43.0 million in India, 21.1 million in China, 9.8 million in Pakistan, 6.1 million in Nigeria and 6.0 million in Indonesia. And Bangladesh is one of the top five countries with high numbers of new childhood pneumonia cases. The predicted number of new childhood pneumonia cases in Bangladesh amounts to 6.4 million each year (Rudan et al., 2008). Pneumonia is the most prevalent cause of death among children in Bangladesh and accounts for 14% of deaths in children under 5 years old each year (Ferdous et al., 2014).

The impact of childhood pneumonia in children includes long-term morbidity, low health-related quality of life, loss of ability for daily activity (Gray & Zar, 2010) and absence from school (Farha & Thomson, 2005). The impact of childhood pneumonia on the families includes loss of work, loss of other childcare and absence from school for other children and heavy financial burden (Farha & Thomson, 2005). Childhood pneumonia not only kills children, but places a huge burden on hospitals and health care systems (Qazi, Weber, Boschi-Pinto & Cherian, 2008). The low resources of the health care system lead to unavailability of oxygen delivery systems, increased workloads, (Gray & Zar, 2010), lengthened hospital stays, higher bed occupation rates, escalating costs for hospital admission / treatment and rising

hospital mortality rates (Fuchs, Fischer, Black & Lanata, 2005). Taking care of these children becomes a burden for family caregivers and poses a serious economic threat to the nation.

In developing countries, the most important evidence found that the causal risk factors occurring are associated with the host and the environment in influencing the incidence of childhood pneumonia. Definite risk factors are malnutrition, low birth weight, non-exclusive breastfeeding, no measles immunization (within the first 12 months of life), indoor air pollution and crowding. Likely risk factors are parental smoking, zinc deficiency, mother's experience as a caregiver, concomitant diseases (e.g. diarrhea, heart disease, asthma). Possible risk factors are mother's education, day-care attendance, rainfall (humidity), high altitude (cold air), vitamin A deficiency, and outdoor air pollution (Rudan et al., 2008). In India, parents' educational attainment was an important risk factor for the occurrence of childhood pneumonia. Poverty, poor immunization status, indoor air pollution, overcrowding and malnutrition / poor nutritional practices appear to be the main risk factors (Ghimire, Bhattacharya & Narain, 2012). Additionally, Bari, Siddiqui, Alam & Hossain, (2007) studied the risk factors of pneumonia in children under 5 years of age in Bangladesh and found the risk factors to be malnutrition, vitamin A and zinc deficiency, low birth weight, overcrowding, bad housing, low socioeconomic conditions, no immunization, and outdoor and indoor air pollution. The factors related to increasing deaths in children under 5 years old include the young age of the mothers, the absence of appropriate education for fathers, the young ages of the children, delayed hospitalization with cyanosis, grunting, related chest indrawing, hepatomegaly, acute malnutrition, inability to drink, related loose stools or heart disease, anemia, rickets, and no breastfeeding (Tiewsoh et al., 2009).

The World Bank reported that 71.90% of people in Bangladesh live in rural areas (Ministry of Health and Family Welfare, 2012). Population-based studies have reported a significant occurrence of pneumonia among children under 5 years living in rural areas (Naheed et al., 2009). Most families and children live in remote areas where more parents suffer from unemployment, inadequate education, improper health care facilities and crowded living conditions. In Bangladesh, it has also been found that 80% of parents are illiterate and poor (Siddique, 2003) while living in

unhygienic conditions where they also suffer from malnutrition, incomplete immunization schedules or no immunization at all. Some parents are literate, but have a dearth of knowledge about how to prevent pneumonia and manage children with pneumonia.

Hospital or community-based management of pneumonia is dictated by the degree of respiratory compromise and appearance of the child. Many older children with mild-to-moderate symptoms may be treated at home (Barnes, 2003). When parents recognize their children's illness, they seek proper care for their child after the child feels better to prevent more severe conditions by not going to the hospital. Therefore, readmission and the incidence rates of childhood pneumonia can be reduced.

According to the author's own 10 years experience in caring children with pneumonia, children who are discharged from the hospital are frequently readmitted with pneumonia. Poorly organized and resourced health systems are the barriers to providing the best care for children under 5 years of age with pneumonia. Poor organization of care includes the absence of a referral system, no record systems for patient follow-up and no pneumonia management programs for parents to care for children at home. Parents of children under 5 years old do not give medication to children following the doctors' orders regularly and follow-up irregularly. Routine nursing care is provided in-patients in the pediatric unit at the hospital with general care such as taking body weight and checking vital signs as well as reducing any infections. For the most part, the pediatrician explains about the diagnosis, prescriptions and advice to the parents. After that, nurses advise the parents about medication and further investigation. Nurses in the pediatric unit provide general health care information for the parents.

When the children are admitted to the hospital, nurses receive the patients and inform the doctor. Nurses observe the patients physical condition to determine whether or not the patients are pale or suffering from respiratory distress, wheezing, nasal obstruction, rapid breathing and restlessness when the airways are cleared and the patients are placed in an upright position. The nurses give oxygen inhalation according to the severity of the patients' conditions. Nurse follow the prescription, then nurse usually teach the parents about the administration of medication and signs

of deterioration in the child's condition. Regarding the health care system in Bangladesh, there is a shortage of nurses and a work overload. In the pediatric ward, nurses care for 60 to 70 patients with only 2 or 3 nurses on each shift. Nurses are very busy with a lot of nursing practices, including special medication and routine care such as giving baths, taking vital signs, mouth care, etc. Nurses do not have enough time to provide sufficient health education. Normally, nurses give some information to the parents during the discharge period such as information on adequate nutrition, exclusive breastfeeding, immunization schedules, hygenic living conditions, avoidance of parental smoking, increased personal hygiene, sanitation and follow-up appointments. There is no teaching media in the pediatric ward.

In Thailand, one study found that insufficient knowledge among mothers of children under 5 years of age with pneumonia concerning the simple signs and symptoms of pneumonia with a dearth of knowledge about the causes and contributing factors associated with pneumonia to the significant results of this study. Maternal knowledge regarding pneumonia assessment and management was a significant factor supporting decreased pneumonia incidence. Increasing in mother's knowledge may be the main factor in reducing the incidence of pneumonia among children under 5 years of age (Siswanto, Bhuiyan & Chompikul, 2007).

In Bangladesh, mothers or primary caregivers of children under 5 years with pneumonia have inadequate knowledge about pneumonia management (Black et al., 2010). The study of Ferdous, et al. (2014) found that mothers described pneumonia as a serious life-threatening disease in young children, but most of them were unable to recognize whether their child had pneumonia or not. When mothers detected that their child either was not breathing properly or had a high fever, or febrile convulsions, or inability to talk or speech cessation, or reluctance to eat, they brought their children to the health care services. Most of them did not have knowledge about the signs and symptoms of pneumonia. They also found that environmental factors such as dust particles spread from coughing mothers and drinking cold water or playing with water were perceived as the causes for pneumonia. Therefore, parents of children under 5 years with pneumonia should have knowledge about the signs and symptoms of the disease, including dangerous signs of pneumonia and how to care and manage their children with pneumonia after discharge from the hospitals.

Parents are the most important caregivers of children. As such, they need to have adequate knowledge regarding the management of pneumonia. Although they have some knowledge about caring for children at home, many parents do not know how to manage their children with pneumonia. If parents had pneumonia management knowledge, they could care for their children with pneumonia and decrease the burden of the disease (Jena, 2014).

According to the aforementioned factors, pneumonia in particular is a significant issue for which health personnel must find problem-solving guidelines to reduce pneumonia incidence rates. The best solution is to provide pneumonia management programs for parents of children under 5 years of age with pneumonia. Providing pneumonia management programs for parents is used appropriate method with implementation of various forms of pneumonia management programs because parents who receive the pneumonia management programs will increase knowledge about pneumonia management, modify behaviors and provide proper practices in pneumonia management expression.

According to the review of related literature, several countries, have been found to have various forms of pneumonia management but there is no pneumonia management program in Bangladesh. The program may depend on public health policies and attention to the problem of childhood pneumonia, especially in Bangladesh which has not taken action about pneumonia management program for parents of children under 5 years of age with pneumonia. However, according to the census statistics on childhood pneumonia have been found to remain high with continuing for pneumonia in under 5 years children. Several forms of practice continue to lack studies together and summarize the overall efficiency of the aforementioned program for implementation as relevant articles and guidelines in effectively organizing pneumonia management program for parents of children under 5 years of age with pneumonia that can be implemented appropriately by age and setting in Bangladesh.

For the above reasons, it can be summarized that pneumonia has already become a serious health problem not only in the author’s clinical setting but also in Bangladesh. Moreover, the aforementioned evidence-based practice demonstrates that

childhood pneumonia leads to more severe health problems and death among children under 5 years of age.

Therefore, this study aims to summarize evidence-based pneumonia management programs for parents of children under 5 years of aged. Accordingly, activities through pneumonia management programs can help increase parental knowledge and skills in caring for children under 5 years of age with pneumonia.

1.2 Clinical problem of the study

Recently, childhood pneumonia has increased dramatically worldwide. The conditions in Bangladesh are no different. In Rajshahi Medical College Hospital (RMCH), 2,450 children under 5 years of age with pneumonia were admitted to hospital and 15.51% of these children died in 2013 (Record Book in the Rajshahi Medical College Hospital, 2013). The routine nursing care provided for out-patients and in-patients in the pediatric unit at the hospital consists of general care such as taking body weight and vital signs as well as checking to reduce any infection. For the most part, the pediatrician explains about the diagnosis, prescriptions and advice to the parents. Next, nurses advise the parents about medication and further investigation. Nurses in the pediatric unit provide general health care information for the parents. When the children are admitted to the hospital, nurses usually teach the parents about the administration of medication and signs of deterioration in the child's condition.

Regarding the health care system in Bangladesh, there is a shortage of nurses and work overload. In pediatric wards, nurses care for 60-70 patients with only 2-3 nurses on each shift. Nurses are very busy with many nursing practices, including special care in giving medication and routine care such as bathing, taking vital signs, mouth care, etc. Nurses do not have enough time to provide health education. Normally, nurses give some information to the parents during the discharge period such as giving adequate nutrition, exclusive breastfeeding, immunization schedules, hygenic living conditions and avoidance of parental smoking with increased personal hygiene and sanitation. There is no teaching media in the pediatric ward. Therefore, parents may not understand the entire information. According to literature and existing

information in other countries, parents explain that nurses play a minor role in providing information to cure their children. When their children are admitted to the hospital, parents do not receive sufficient information because nurses are very busy with an overload of patients and work. When parents recognize their children's illness, they seek proper care for their child after the child feels better to prevent more severe conditions by not going to the hospital. Therefore, readmission and the incidence rates of childhood pneumonia can be reduced.

According to the perspectives of Bangladesh and the author's work experiences in her own clinical setting, most of the children with pneumonia have parents with limited knowledge about pneumonia management. This implies that more education is required to equip parents with essential knowledge about caring for children with pneumonia. However, no health education programs about pneumonia management have been provided for the parents of children under 5 years of age with pneumonia in the author's clinical setting.

There are no evidence-based guidelines for pneumonia management programs. Nevertheless, nurses working at the hospital have never implemented the education programs. They have limited resources and knowledge on evidence-based practice and standard practice. Nursing practices are only based on personal knowledge, experiences and the doctors' prescriptions. In this situation, the author needs to find an appropriate guideline on pneumonia management programs that are applicable to the clinical setting. As a result, this setting will have a pneumonia management program for the care of children with pneumonia to ensure that parents gain better caring skills for their children with pneumonia.

In line with the present findings, an evidence-based pneumonia management program is needed to increase parental knowledge and skills about caring for children with pneumonia in order to promote frequent comprehensive child caring practice, prevent further impact from pneumonia and reduce readmission rates. In Bangladesh, however, a well-established evidence-based pneumonia management program for parents of children under 5 years of age with pneumonia is not available. Therefore, the author would like to review the best available evidence and summarize the contents regarding a pneumonia management program for this group of parents.

1.3 Purpose of the study

The purpose of this study is to summarize evidence-based pneumonia management programs for parents of children under 5 years old.

1.4 Expected benefits of the study

1.4.1 Nurses and health care professionals will gain a body of knowledge related to pneumonia management programs in terms of the characteristics of the program and methods of teaching with training and teaching content.

1.4.2 Nurses can apply the recommendations from this study to develop an appropriate pneumonia management program for parents of children under 5 years old.

1.4.3 The hospital will have a clinical practice guideline for use with parents to improve knowledge and practice for mothers of children under 5 years old.

CHAPTER II
METHODOLOGY

2.1 Search Strategy

The search strategy was applied in order to meet the purpose of the study concerning the correlations with population, intervention and research findings. A search strategy was applied to find articles and guidelines for analysis and summarized of the evidence related to pneumonia management program for parents of children under 5 years old. The strategy for searching evidence in articles and guideline employed the PICO format with appropriate use of keywords. After finding the articles and guideline, the evidence in the articles and guideline was evaluated by considering the validity, reliability, applicability and level of strength.

2.1.1 Search framework: By using the PICO framework**,** the author searched and selected evidence to improve parents' knowledge and skills in caring for children under five years of age with pneumonia through a pneumonia management program as described below:

P (Population) = Parents of children under 5 years of age.

I (Intervention) = Pneumonia management program.

C (Comparison) = Usual activities/usual care.

O (Outcome) = Knowledge and skills in caring for children with pneumonia.

2.1.2 Scope of the search: The pneumonia management program for parents on knowledge and skills in caring for children under five years of age with pneumonia was based on validated evidence-based practice discovered through searching by using the PICO framework and relevant keywords to find out the appropriate evidence-based practice.

1) Keywords used in the search according to the PICO framework:

P (Population) = Parents / mothers / caregivers / children under five years old / pneumonia / childhood pneumonia / acute respiratory tract infection.

I (Intervention) = Pneumonia management program / health education program / prevention program / preparation of caregivers.

C (Comparison) = Usual activities / usual care.

O (Outcome) = Knowledge and skills in caring for children with pneumonia.

To find out related evidence-based practice, the author selected the scope of the search by following the PICO framework and conducted the search with relevant keywords to help obtain relevant evidence-based practice. The author used a "Boolean operator" as a searching technique. For each PICO element, the author used different synonyms and linked the terms with "OR", then located citations relevant to all of the PICO elements by linking with "AND".

2) Databases / sources used for the search: The author used the electronic databases of the Mahidol University library system and expected to obtain available evidence-based practice about pneumonia management programs by searching from the Cumulative Index to Nursing and Allied Health (CINAHL), Ovid Full Text, Proquest nursing, PubMed and Science Direct, which were used to search for single research studies. Then the author searched further in libraries and electronic databases including Google Scholar and the National Institute for Health and Care Excellence websites.

3) Types of evidence: The author searched and selected the best available evidence-based practice for guidelines, systematic reviews of randomized controlled trials (RCTs), quasi-experimental studies and high quality single randomized controlled trials acquired from full text studies published in English from 2010 to 2014.

2.2 Appraisal method and levels of evidence

2.2.1 Appraisal method: The author used the method and criteria as proposed by Melnyk and Fineout-Overholt (2011) to appraise the quality of the evidence in terms of validity, reliability and applicability. The collected evidences were appraised on the basis of the following three questions:

1) Validity: The validity of the evidence means whether or not the evidence was conducted through scientific method and able to scientifically answer the research questions. It is the findings were proposed to answer the questions and solve the problems. Some bias influences the results, which are selection bias to reduce influencing bias, randomly assign participants to experimental and comparison groups should be organized. Randomization is an important step for the validity of a study and makes the results more likely to be valid. Validity is significant for research because it helps to measure the types of tests the author uses and ensures that the methods used are not only ethical and cost effective, but also truly measure the ability to meet all of the requirements and solve the clinical problems. The evidences are developing processes and contain of evidences that are important validity measurement tools (Melnyk and Fineout-Overholt, 2011).

2) Reliability: Reliability means the findings can be developed on for accuracy, honesty, consistency, achievement and repeatability in order to ensure that anyone can perform the same experiment by using similar equipment and conditions to achieve exactly the same outcome. Testing the validity of the resrarch findings requires examination and evaluation the results of the research. The reliability can be assessed by intervention effect. Reliability consists of internal and external reliability. Internal reliability measures consistency and external reliability to measure the varieties from one use to another such as from the research setting in reference to the settings in order contexts. In evidence, the reliability is measured by the member of the development authority, funding agency and the implementation of the evidence (Melnyk and Fineout-Overholt, 2011).

3) Applicability: The eventual goal of any research is to apply the results to the patient individually or in a group. Applicability means the usefulness of the results in a given situation. Validity, reliability and usefulness for clinical decision-making are considered during the application of the results in a clinical setting. In selected evidence, the applicability is measured by matching with setting conditions, resources availability, abilities of the health care providers, benefits of the patients and families, community or society and national support by the authority (Melnyk and Fineout-Overholt, 2011).

3.1 Feasibility of implementation: This type of experimentation will be supported by the ability of society and measured by the support received from the authority of the organizations which was measured with encouragement in terms of personnel, equipment, tools and instrumentation with complexity of methods.

3.2 Cost and Benefit Ratio: Through applying this evidence more effective outcomes were yielded than regular practice. Furthermore, the risk of the patients for unpleasant incident was further reduced. The implementation required no extra expenses, because the equipment used is simple and available in the hospital. As a result, episodes of pneumonia were reduced, thereby lowering medical expenses, increasing client satisfaction and decreasing burdens on families by saving money and time.

2.2.2 Appraisal methods for the guidelines: The author selected guideline for appraisal that were scientific, evidence- based, compatible with real clinical settings and published in 2011. The guideline was evaluated by the AGREE II appraisal method (Brouwers et al., 2010). This AGREE II refers to the validity, reliability and applicability of the guidelines. The principle of the tool is to differentiate between higher and lower quality of guidelines. The appraisal method using AGREE II consists of 6 domains with 23 key items. The domains are as follows:

1. **Domain 1** Scope and Purpose.
2. **Domain 2** Stakeholder Involvement.
3. **Domain 3** Rigor of Development.

4. Domain 4 Clarity of presentation.

5. Domain 5 Applicability.

6. Domain 6 Editorial Independence.

This evaluation also included the scope of the quality of the guidelines and whether or not the recommendations should be suggested for used in a clinical setting. The key items were rated on a rating scale with the following range of ratings: 1 = (Strongly Disagree) to 7 = (Strongly Agree). Score of 1 is given when there is no information on that item or if it is weakly reported. A score of 7 is given if the quality of coverage is excellent and when full criterions have been met (in the User's Manual). The items in each domain of the AGREE II appraisal instruments are described below:

Domain 1 Scope and Purpose

1. The overall objectives of the guideline are specifically described.

2. The clinical question is covered and specifically described.

3. The guideline describes specific population, patients or public.

Domain 2 Stakeholder Involvement

4. The guideline development committee includes from all related professional.

5. The preferences and views of the guideline for target population.

6. The target users of the guidelines are clearly defined.

Domain 3 Rigor of Development

7. Systematic methods are used to search for evidence.

8. The criteria for selecting the evidence are clearly described.

9. The strengths and limitations of the body of evidence are clearly described.

10. The methods for formulating the recommendations are clearly described.

11. The health benefits, side effects and risks have been considered in formulating the recommendations.

12. There is an explicit link between the recommendations and supporting evidence.

13. The guidelines have been externally reviewed by experts prior to publication.

14. A procedure for updating the guideline is provided.

Domain 4 Clarity of presentation

15. The recommendations are specific and unambiguous.

16. The different options for management of the condition or health issue are clearly presented.

17. The guidelines' key recommendations are easily identifiable.

Domain 5 Applicability

18. The guideline is provides advice and / or tools on how the recommendations can be put into practice.

19. The guidelines describe facilitators and barriers to application.

20. The potential cost implications of applying the recommendations have been considered.

21. The guidelines present monitoring and / or auditing criteria.

Domain 6 Editorial Independence

22. The content of the guidelines has not been influenced by the funding body.

23. The competing interests of guideline development group members have been recorded and addressed.

2.2.3 Evaluation of the strength of the evidence: In order to assess the level of ecah evidence, the author used the level of the rating system for the hierarchy of evidence stated by Melnyk and Fineout-Overholt (2011). The details levels of the rating system for the hierarchy of the evidence are described in the table 2.1 below:

Table 2.1 Level of rating system for the hierarchy of evidence, (Melnyk and Fineout-Overholt, 2011).

S/No	Level of Evidence	Source of Empirical Evidence
1	Level I	Evidence from a systematic review or meta analysis of all relevant RCTs.
2	Level II	Evidence obtained from well-designed RCTs
3	Level III	Evidence obtained from well-designed controlled trials without randomization.
4	Level IV	Evidence from well-designed case-control and cohort studies.
5	Level V	Evidence from systematic reviews of descriptive and qualitative studies.
6	Level VI	Evidence from single descriptive or qualitative study.
7	Level VII	Evidence from the opinion of authorities and / or reports of expert committees.

CHAPTER III
FINDINGS

The search results and summary of evidence are described in order to detail the intervention concerning educational programs about pneumonia management for parents of children under 5 years old with pneumonia. The details of the descriptions are as follows:

3.1 Search results

The author searched the electronic databases of the Mahidol University Library system for evidence of pneumonia management programs for parents of children under 5 years old. After completing the search for evidence, the author obtained different types of evidence including research articles and guidelines. Initially, the author collected 31evidences based on pneumonia management programs for parents of children under 5 years old. After the preliminary screening on the titles and abstracts, the author selected 20 evidences and eliminated 11 evidences. The 11 evidences were eliminated due to the fact that the evidence did not provide specific measurement on caring for children with pneumonia, failed to provide updated information and were not published in English.

Before the secondary screening, the author read each evidence superficially and selects 10 evidences. In the third and final phase of the selection, the author read each evidence in detail and eventually selected five evidences that specifically described pneumonia management programs for parents of children under five years old with pneumonia. The selected evidence included three quasi-experimental studies, one pre-experimental study and one international guideline. All evidences were published in English from 2010 to 2014.

The list of the selected evidences with their type and level of evidence is indicated in Table 3.1. The evidence includes 3 quasi-experimental studies (one study level-III, another two studies level-IV), 1 pre-experimental study (Level-IV) and 1 international guideline (Level-II).

Table 3.1 Selected evidence, research design and strength of the evidence

S/No	Author, title and source of publication	Study design	Level of strength of evidence
1.	Parvez, M. M., Wiroonpanich, W., & Naphapunsakul, M. (2010). The effects of educational program on child care knowledge and behaviors of mothers of children under five years with pneumonia. *Bangladesh Journal of Medical Science, 09*(3), 136-142.	Quasi-experimental study.	Level III
2.	Zein El Dein, N. A., Elbahnasawy, H. T., & Diab, S. S. (2013). The effect of guidance booklet on discharged mothers of children with respiratory tract infection. *Journal of Natural Sciences Research, 3*(2), 83-97.	Quasi-experimental study.	Level IV
3.	Jena, M. (2014). Effectiveness of information booklet on knowledge & practice about prevention of pneumonia among mothers of under five children. *International Organization Scientific Research Journal of Nursing and Health Science, 3*(1), 25-30.	Pre-experimental study.	Level IV

Table 3.1 Selected evidence, research design and strength of the evidence (cont.)

S/No	Author / Year	Study design	Level of strength of evidence
4.	Prasanna, K. L., & Sharma, N. K. (2014). Effectiveness of structured teaching programme vs. Self-instructional module regarding prevention of acute respiratory infections in children among mothers. *International Organization of Scientific Research Journal of Nursing and Health Science 3*(1), 09-15.	Quasi-experimental study.	Level IV
5.	Harris, M., Clark, J., Coote, N., Fletcher, P., Harnden, A., McKean, M., & Thomson, A. (2011). British Thoracic Society guidelines for the management of community acquired pneumonia in children: Update 2011. *Journal of the British Thoracic Society*, 66:ii1 eii23.	International guideline	Level II

Summary of the five selected evidences: Each evidence was read and the contents related to education program about pneumonia management were extracted and briefly presented.

Evidence Number 1

Title: The effects of educational program on childcare knowledge and behaviors of mothers of children under five years with pneumonia

Authors / year: Parvez, M. M., Wiroonpanich, W., & Naphapunsakul, M. / 2010.

Publication source: Bangladesh Journal of Medical Science.

The objective of this study was to evaluate the effects of educational programs on child care knowledge and behaviors of mothers of children under five years of age. The study was based on a quasi-experimental research design. The study was conducted in a public hospital in Dhaka, Bangladesh. The participants were composed of fifty mothers of children under five years who had been admitted to the hospital with pneumonia. The experimental and control groups were equal. The study intervention was an educational program. The intervention was provided by the researcher (Nurse). In this study, the teaching methods used included lecture, demonstration and return demonstration. The materials used were flipcharts and leaflets. The duration of the intervention was two hours. The experimental group received an educational program and the control group received routine treatment only. The content in the program was composed of the definition of pneumonia, etiology of pneumonia, risk factors for pneumonia, signs and symptoms of pneumonia, management and care, immunization and prevention of pneumonia. The mothers' knowledge was measured by a questionnaire with 44 true-false questions. Six maternal behaviors (respiratory rate, identifying chest retraction, measuring temperature, providing tepid sponging, cleaning nose or airway and measuring medication) were measured by a behavioral checklist with 22 items. The data were analyzed by the SPSS software. According to the findings, the study group mothers' pretest knowledge score was 26.40 with a posttest score of 34.64 ($p<0.001$). After the intervention, the mothers' childcare behaviors were significantly higher in the study group at 17.68 while the same score in the control group was 6.64 ($p<0.001$). Hence, there was a significant increase in child care knowledge and behaviors of mothers of children under 5 years of age with pneumonia.

Evaluation of the evidence

Validity: The objectives of the study were clearly identified. The intervention was the education program. The program was developed by the researcher. Fifty mothers were randomly allocated into experimental and control groups, and the allocation was concealed. The baseline information about the subjects in the intervention and control groups was equal. However, the patients, health workers and researchers were not blind to the treatment. Aside from the experimental

intervention, the groups were treated equally. The measurement was developed in English but translated into Bengali by using the back translation technique with validation by three experts. The Chronbach's alpha of the mothers knowledge questionnaire was 0.72 and behavioral checklist was 0.70 and acceptable. The outcomes were measured with questionnaires and a behavioral checklist.

Reliability: The primary outcomes, which are knowledge and practice for pneumonia management statistically significant between intervention and control groups. The improvement of the child care knowledge and behaviors of mothers were clearly identified.

Applicability: The study was developed as a hospital-based educational program for mothers of children under 5 years of age with pneumonia. This type of program is easy to apply in the author's clinical setting because the program uses simple media. Nevertheless, the program requires a nurse for instruction and demonstration.

Evidence Number 2

Title: The effects of guidance booklets on discharged mothers of children with respiratory tract infections

Authors / year: Zein El Dein, A. N., Elbahnasawy, H. T., & Diab, S. S. / 2013.

Publication sources: Journal of Natural Sciences Research.

The objectives of this study were to evaluate the effects of guidance booklets on discharged mothers of children with respiratory tract infections through: Identifying mothers' needs, developing a guidance booklet on discharge according to mothers' needs and evaluating the effects of the guidance booklets on the mothers' childcare skills and pneumonia management, the research design was a quasi-experimental study. Both groups pretest and posttest design. The study was conducted at the pediatric unit in El- Menoufya University Hospital (Egypt) and El-Basher Hospital (Jordan). The total participants were composed of 80 mothers who had children suffering from respiratory tract infections. The researchers divided the sample into two equal groups. Inclusion criteria of the study were children aged from 2 months to 5 years of age who were only suffering from respiratory tract infections.

Exclusion criteria of the study were children over 5 years of age suffering from other diseases. The study intervention was a guidance booklet with discharge instructions. Both groups participants were received guidance booklet with discharge instructions. The intervention was provided by the researcher. In this study, teaching methods were used in the discussion with the guidance booklet, role play, demonstration and redemonstration. The material used comprised posters. Intervention consists of two sessions with each session lasting 60 minutes. At the first session, the researcher individually met with the mothers and discussed the child's problems and needs. At the second session, the researcher met with all of the mothers together to discuss the content of the booklets. The content in the booklets was composed of the definition of respiratory infection, danger signs of respiratory infection, nutrition, fluids, medication administration (dose, route, methods of administration, side effects) and follow-up appointments. The mothers' knowledge was measured by questionnaires. The mothers' practices were (child position, use nasal drops, check auxiliary temperature, tap compresses and hand washing) measured by asking questions with an observational checklist. The data were analyzed by the Excel program and SPSS software. The mothers had to be able to measure vital signs correctly, understand and interpret the values obtained and determine the severity of respiratory distress. Before discharge, mothers should be taught and give opportunities to practice techniques such as measuring temperature, administering care procedures, using and monitoring equipment and recognizing symptoms and other elements of child care. The mothers should also be assessed in order to identify their medical knowledge, which is very important. According to the findings, the mothers' knowledge and practice was highly and significantly different in both groups. The mothers' knowledge and practice regarding respiratory tract infections (management, medication, applying simple procedures, preparedness for education and equipment used in measuring temperature, using tap compresses, giving oral and other medication, appropriate nutrition and adequate fluid intake) was indicated to have statistically significant improvement after the guidance booklets with discharge instructions in both groups.

Evaluation of the evidence

Validity: The objectives of the research study were clearly identified to evaluate the effects of guidance booklets in each setting. The intervention was a teaching program using a guidance booklet with discharge instructions. Eighty mothers were randomly allocated into each setting. The media used in the study was well-developed based on the needs of the participants. Measurement was developed by researcher and validated by nursing expertise from the pediatric specialists of 5 Faculties'.

Reliability: The primary outcomes, namely, knowledge and practice for pneumonia management were statistically significant improvements between pretest and posttest in both groups.

Applicability: The study developed a hospital-based guidance booklet with discharge instructions for mothers of children with respiratory tract infections. This type of program is easy to apply in the author's clinical setting. Although this program might use simple media, it needs to provide the teaching technique in greater detail.

Evidence Number 3

Title: Effectiveness of information booklets on knowledge & practice about prevention of pneumonia among mothers of under five children

Author / Year: Jena, M. / 2014.

Publication source: International Organization of Scientific Research Journal of Nursing and Health Science (IOSR-JNHS).

The main objective of the study was to assess the effectiveness of information booklets on knowledge and practice about prevention of pneumonia among mothers of children under five years of age. The study design was pre-experimental with a one-group pretest and posttest design. The study was conducted at the pediatric ward of Medical College Hospital, Odisha. In this study, the participants were 50 mothers of children under five years of age who were admitted to the pediatric ward with pneumonia. Inclusion criteria: Mothers of children under five years of age admitted to the pediatric ward of the Medical College Hospital, Odisha, who were able to read and write in Oriya and English. Exclusion criteria: Mothers of

children over five years of age who could not read in Oriya and English**.** The study intervention was composed of information booklets. The intervention was provided by the researcher. The content in the booklet consisted of risk factors for pneumonia, etiology of pneumonia, signs and symptoms of pneumonia, prevention of pneumonia and when to seek medical help. Mothers' knowledge regarding the prevention of pneumonia was measured by 25 items composed of multiple-choice questions. The mothers' practices regarding the prevention of pneumonia were measured by 17 items rated on 3-point rating scales. The data were analyzed by the SPSS program. The study found that the mean pretest knowledge score was 11.54 and the posttest score was 19.94. The mothers' posttest knowledge score was higher than the pretest knowledge score, which indicates a marked gain in knowledge about prevention of pneumonia. The study showed that the mean pretest practice score was 32.8 with a posttest score of 41.5. The mothers' posttest practice score was higher than the pretest practice score, which indicates an improvement in practice about prevention of pneumonia.

Evaluation of the evidence

Validity: The aims of the study were clearly recognized. The intervention was a teaching program using an information booklet about the prevention of pneumonia. Fifty mothers were assigned to one group. Hence, the findings on the knowledge and practice of the mothers cannot be said to have been improved because of the information booklets because there was no comparison. However, the researchers do not exactly state the methods for teach the mothers of the program. The booklet media was developed by researchers and measurements for the knowledge questionnaire were measured by the multiple choice questions and 3-point practice scales.

Reliability: The primary outcomes, namely, the knowledge and practice of the mothers of children under five on the prevention of pneumonia showed a significant increase between the pretest and posttest scores.

Applicability: The study developed a hospital-based information booklet about the prevention of pneumonia among mothers of under five children. This type of program is feasible for application in the author's clinical setting. The program requires methods and media for teaching and demonstration.

Evidence Number 4

Title: Effectiveness of structured teaching programme vs. self-instructional module regarding prevention of acute respiratory infections in children among mothers

Authors / Year: Prasanna, K. L., & Sharma, N. K. / 2014.

Publication source: International Organization of Scientific Research Journal of Nursing and Health Science.

The objectives of this study were to determine the effectiveness of Structured Teaching Program (STP) and self-instructional module (SIM) on knowledge regarding the prevention of ARI among the two groups and to compare the effectiveness of STP and SIM on knowledge regarding the prevention of ARI among the two groups. The research design was a quasi-experimental study. The study was conducted in a Mahalakshmipuram urban area in Bangalore, India. A total of 60 mothers were randomly assigned into STP and SIM groups. The study intervention was two teaching strategies with a structured teaching program (STP) and a self-instructional module (SIM). The intervention was provided by the researcher. The content of the STP and SIM consisted of the definition of acute respiratory infection, explanation of the etiology and clinical features of acute respiratory infection, descriptions of the common cold, bronchitis and pneumonia with preventive measures. Mothers' knowledge was measured by structured questionnaires regarding acute respiratory infections in children. According to the findings (structured teaching program and self-instructional module), both groups of mothers' posttest knowledge scores were higher than the pretest knowledge scores with marked gains that were better in posttest than the pretest. The mean difference between the pretest and posttest knowledge scores was significant ($p<0.01$) in both groups. But the STP group of mother's posttest knowledge score was 22.33 and the SIM group was 19.77. The STP group of mothers' knowledge was higher than the SIM group and the STP group

increased significantly ($p<0.05$). Hence, the SIM group of mothers should be encouraged to improve their knowledge regarding the prevention of acute respiratory infection for proper care, support and appropriate management with prevention of complications for their children.

Evaluation of the evidence

Validity: The objectives of the study were clearly identified to evaluate the effects of structured teaching programs (STP) and self-instructional modules (SIM). The intervention involved teaching strategies using the structured teaching program (STP) and self-instructional module (SIM). Sixty mothers were randomly allocated into STP and SIM groups. The method involved teaching strategies but did not identify the exact teaching procedures. However, the researchers did not exactly identify the media and components of the STP and SIM groups for teaching the mothers. The primary outcomes were measured by questionnaires.

Reliability: The primary outcomes, namely, the knowledge of mothers on ARI, were significantly greater between the pretest and posttest knowledge in both groups.

Applicability: The study population, objectives and expected outcomes of community- based structural teaching program and self-instructional module regarding the prevention of acute respiratory infections in children among mothers. It is quite fit for application in the community because very few nurses are posted in the community. In future, the author may apply the intervention in her local setting for better management of children with acute respiratory infections.

Evidence Number 5

Title: British Thoracic Society guidelines for the management of community acquired pneumonia in children: Update 2011

Authors / Year: Harris, M., Clark, J., Coote, N., Fletcher. Harnden, A., McKean, M., & Thomson, A. / 2011.

Publication Source: Journal of the British Thoracic Society.

Parents of children receiving care at home should be given information on the management of fever for which patients can receive liquid Paracetamol. Tepid

sponging is not recommended because tepid sponging (sponging with warm water) does not bring a child's temperature down for long and the fever will go back up as soon as the sponging is stopped. Sponging does not affect the part of the brain that controls temperature. Using cool water can be uncomfortable for a child, and if the child cries or shivers, the body temperature usually goes up, not down. Preventing dehydration involves encouraging children to drink water. Parents must recognize signs of other serious illnesses. Hence, the parents were provided with verbal or written information on warning symptoms. A follow-up appointment was scheduled with a certain date and time. Furthermore, the researcher communicated with other healthcare professionals to ensure the parents had direct access to further assessment for their children.

Evaluation of the evidence

Validity: The guidelines do not clearly describe the objectives, but mention some important activities about management with pneumonia, including the management of fever, preventing dehydration, identifying any deterioration of severe illness and communicating with other healthcare professionals. If any severe conditions occur with children, they should be admitted to hospital. This guideline was developed by the British Thoracic Society Standards of Care Committee, which is an international agency in the UK working with pneumonia in children to raise parental awareness, promote prevention, establish early detection strategies and advocate for better standards of care through research. However, some suggestions of this guideline were summarized from expert opinion.

Reliability: The guideline was developed by the British Thoracic Society (BTS) which is recognized worldwide as a dependable organization working for pneumonia patients to fight the consequences of pneumonia and help those affected by pneumonia through research to manage, cure and prevent pneumonia in patients. Hence, the guideline is reliable for pneumonia management in parents of children under 5 years old.

Applicability: The British Thoracic Society Standard Guidelines focus on certain tasks for pneumonia management which can be implemented in the hospital as a guideline for nurses to help parents effectively manage their children with pneumonia.

3.2 Conclusion

3.2.1 Summary of the evidences: In conclusion, the author describes the successful intervention and outcome of these of evidences as follows:

The author obtained 31 studies in which 5 studies met the inclusion criteria, of these, three studies were quasi-experimental studies, one was a pre-experimental study, and one was an international guideline; 26 evidences were excluded from the study. All selected evidences were published in English from 2010 to 2014. Before conducting the study, the author had the evidence approved by expertise of the defense committee and concluded that “health education about pneumonia management intervention” is a valuable method for parents of children under 5 years old to manage pneumonia.

1) Participants: All of the study participants were mothers of children under 5 years old with pneumonia or acute respiratory infections.

1.1 Characteristics of the mothers: According to four studies, the mothers were at least 35 years old ((Parvez, Wiroonpanich & Naphapunsakul, 2010: Level III; Zein El Dein, Elbahnasawy, & Diab, 2013: Level IV; Jena, 2014: Level IV; Prasanna, & Sharma, 2014: Level IV). Most of the participants in the studies were housewives (Parvez et al., 2010: Level III; Zein El Dein et al., 2013: Level IV; Jena, 2014: Level IV; Prasanna, & Sharma, 2014: Level IV). According to four studies, most of the mothers’ education levels were secondary level at 40% to 68% (Parvez et al., 2010: Level III; Prasanna, & Sharma, 2014: Level IV; Zein El Dein et al., 2013: Level IV; Jena, 2014: Level IV).

1.2 Characteristics of the children: According to five studies, the children under five years of age did not suffer from other associated diseases.

2) Settings: All of the studies were provided health education programs and conducted in the hospital, out patients clinics and communities (Parvez et al., 2010: Level III; Zein El Dein et al., 2013: Level IV; Jena, 2014: Level IV; Prasanna, & Sharma, 2014: Level IV; Harris et al., 20011: Level II).

3) The components of pneumonia management: No evidence discussed about the components of pneumonia management among children. However, the author summarizes the components of pneumonia management as follows:

3.1 Child health promotion

3.2 Pneumonia prevention

3.2.1 Monitoring and assessment

3.2.2 Caring for child symptoms

3.3.3 Evaluation.

3.1 Child health promotion: Only one evidence included content about the child health promotion consisting of appropriate nutrition, exclusive breast feeding, proper diet, immunization schedules, adequate rest, hygienic measures such as nose cleaning, equipment cleaning, careful hand washing and changing wet clothes (Zein El Dein et al., 2013: Level IV).

3.2 Pneumonia prevention: For the most part, the research identified the contents including the definition, etiology, risk factors, signs and symptoms, mode of transmission, complications and avoiding contact with sick persons (Parvez et al., 2010: Level III; Zein El Dein et al., 2013: Level IV; Jena, 2014: Level IV; Prasanna, & Sharma, 2014: Level IV; Harris et al., 2011: Level II).

3.2.1 The components of monitoring and assessment of children with pneumonia consist of respiration in which mothers should assess children's respiration when there is difficulty or rapid breathing, signs of dehydration, signs of other serious illnesses and medication administration (Harris et al., 2011: Level II; Zein El Dein et al., 2013: Level IV).

3.2.2 The components of caring for the children's symptoms consist of management and care of dehydration and management of fever (Parvez et al., 2010: Level III; Zein El Dein et al., 2013: Level IV; Harris et al., 2011: Level II).

3.2.3 The component of evaluation for the children with pneumonia consisted of follow-up appointments scheduled at certain dates and times (Zein El Dein et al., 2013: Level IV; Harris et at., 2011: Level II).

4) Type of education program: The following two types of education programs were available: Individual and group educational programs.

Individual educational program: Only one study was provided individual education for one hour in the hospital. The researchers individually met with mothers and discuss the child's problems and needs (Zein El Dein et al., 2013: Level IV).

Group educational program: Two studies were provided group education for one hour in the hospital**.** The researcher met with all of the mothers for discussion (Parvez et al., 2010: Level III; Zein El Dein et al., 2013: Level IV).

4.1 Teaching activities: The health education programs increased the knowledge and practice of mothers of children under 5 years old. In most of the studies, the methods used health education consisting of lectures, group discussions, role play, and demonstration and return demonstration.

4.1.1 Lectures and discussion: Two studies use lecture and follow with discussion (Parvez et al., 2010: Level III; Zein El Dein et al., 2013: Level IV). Only two studies state that they provide 60 minutes lectures about the contents of pneumonia management (Parvez et al., 2010: Level III; Zein El Dein et al., 2013: Level IV). The education programs used booklets, flipcharts, posters and leaflets as media for learning of mothers of children under 5 years of age.

4.1.2 Demonstration and return demonstration: Only two studies state that they provide 60 minutes demonstration and return demonstration about the activities of pneumonia management which are temperature measured, child position and nose clearing (Parvez et al., 2010: Level III; Zein El Dein et al., 2013: Level IV). During the demonstration and return demonstration, the researchers used doll models and thermometers as equipments for practice. In addition, researchers discussed with mothers.

5) Outcome Measurements: The outcomes of the health education programs can be primarily assessed by evaluating mothers' knowledge and practice in

caring for children with pneumonia. The outcomes can be evaluated by the following instruments:

5.1 Mothers' knowledge is aimed at determining the definition, etiology, risk factors, signs and symptoms, management and care, immunization and prevention of pneumonia. The questionnaire consisted of 44 true-false questions in which each group had similar or different levels of the aforementioned aspects of pneumonia. The structures of measurement were true-false questions and multiple choice questions. The true-false questions were used before and after implementing the education programs. The responses for each question are arranged within a scoring range from 0 to 1 point. The questionnaire was self-administered in which high scores indicated that mothers' knowledge had improved (Parvez et al., 2010: Level III). Another study evaluated by interviewing with questionnaires, which a good scoring range was more than 75% and a poor scoring range was less than 50% (Zein El Dein et al., 2013: Level IV). The multiple choice questions were assessed mothers' knowledge with a maximum possible score of 25 (Jena, 2014: Level IV).

5.2 Mothers practice can be assessed asking questions and observational checklist. The practice score is 1 for done, and 0 for not done (Zein El Dein et al., 2013: Level III). Another study was measured practice with 17 items of 3-point practice scales. The total score 51 points, which the higher score indicated that the higher level of practice of mothers regarding the prevention of pneumonia (Jena, 2014: Level III).

In conclusion, all of the above evidence supported that health education programs about the pneumonia management program are a very effective means of increasing parents knowledge and skills in caring for children with pneumonia. The programs applied certain strategies in the education programs about pneumonia management to improve knowledge and skills in caring for children in real situations, e.g. providing adequate nutrition, exclusive breastfeeding, immunization schedules, hygienic living conditions, avoidance of parental smoking, increased personal hygiene and sanitation with modified health behavior, understanding about the disease severity and susceptibility. For these purposes, the researchers used lecture, group discussion, role play, demonstration, and return demonstration with booklets, flipcharts, leaflets

and posters. Parents were motivated about healthy behaviors and gained knowledge about how to manage their children with pneumonia at home.

3.2.2 Recommendations from the evidences

1. Pneumonia management training requires nurses to teach the parents in clinical practice. In order to have competent nurses to arrange a pneumonia management program, the authority should train the nurses (Parvez et al., 2010: Level III).

2. Pneumonia management programs should be provided for high-risk groups of children under five years old (Zein El Dein et al., 2013: Level IV; Jena, 2014: Level IV).

3. Both individual and group health education interventions are effective for parents in pneumonia management. Individual health education is more effective at improving awareness for pneumonia management (Zein El Dein et al., 2013: Level IV). However, in context of Bangladesh, which shortage of nurses, it is quite difficult to provide individual education; therefore, group health education may be appropriate in the aforementioned setting.

4. Parents should be taught about the nature of the disease, management and care, medication administration and when to seek medical help, management of fever and prevention of dehydration, and identification of signs of deterioration and signs of severe illness. In addition, improvement of child health information about immunization and nutrition should be added for parents in order to promote child health (Parvez et al., 2010: Level III; Zein El Dein et al., 2013: Level IV; Harris et al., 2011: Level II).

5. Pneumonia management programs can be conducted using many materials, such as manuals, pamphlets, video presentations and computer assisted instruction. In the clinical setting, which are limited computer aids. In some setting, for example, in the pediatric ward, manual and group discussion is feasible. However, in outpatient unit, video presentation should be provided to a large group of mothers (Zein El Dein et al., 2013: Level IV; Jena, 2014: Level IV).

6. The setting for the pneumonia management program should be established in-patient and outpatient clinics (Zein El Dein et al., 2013: Level IV; Jena, 2014: Level IV).

7. The selected evidence measures the outcomes in terms of knowledge and practice, and no evidence measured the outcomes with the incidence rate of pneumonia. The secondary outcomes for pneumonia management should be the readmission rates of children with pneumonia which can reflect the effectiveness of the pneumonia management program.

CHAPTER IV
CONCLUSION AND SUGGESTIONS

4.1 Conclusion

Childhood pneumonia is a major public health problem worldwide. The incidence of childhood pneumonia is rising across the globe day by day. Despite the progression of pneumonia prevention programs, the rate of new childhood pneumonia incidence has continued to increase, and this problem is a leading cause of death. In Bangladesh, caring for children with pneumonia is a parental role. Parents of children under 5 years of age with pneumonia do not take care of their children properly, not give medicine to children following the doctors orders regularly and follow up irregularly. Although parents have some knowledge regarding caring children at home, they do not know how to manage their children with pneumonia. However, many parents have deficient knowledge and practice. In addition, there are limited health care facilities for childhood pneumonia.

In the author's clinical setting, there is no specific program provided for children with pneumonia and families. When the children are admitted to the hospital, nurses usually teach the parents about the administration of medications and the signs of deterioration in the child's condition. Nurses give some information to the parents during the discharge period, such as providing adequate nutrition, exclusive breastfeeding, immunization schedules, hygienic living conditions and avoidance of parental smoking with increased personal hygiene and sanitation. There is no teaching media in the pediatric ward. Therefore, parents may not understand the entire information. Hence, evidence-based practice is required to improve the knowledge and practice of parents in caring for children with pneumonia.

Evidence-based practice is an important integration of scientific papers, updated information, clinical experience and patients' performance. Furthermore, evidence-based practice is now accepted and can be used to improve the quality of care. If a program increases parents' knowledge about pneumonia management, the

potential benefit promotes frequent child care practice to deliver proper care for children with pneumonia, reduce readmission rates and decrease treatment costs as well as reduce family burdens, especially financial burdens. As a result, evidence-based practice is useful for pneumonia management programs for parents of children under 5 years of age. The main objective of this study was to summarize pneumonia management programs for parents of children under 5 years of age from evidence-based practice and draw conclusions with recommendations from the evidence obtained.

For the above mentioned reasons, the author searched for available current evidence by using the Mahidol University Library system electronic databases and different websites to search for related evidence-based practice. The Cumulative Index to Nursing and Allied Health (CINAHL), PubMed, Proquest Nursing, Ovid full text, Science Direct and Google Scholar were used to search for experimental studies. The PICO framework was used to guide the keywords for the search. P (Population) = “Parents of children under 5 years old”. I (Intervention) = “Pneumonia management program”. C (Comparison) = “Usual activities” or “usual care”.O (Outcome) = “Knowledge and skill in caring for children with pneumonia”. The author used a Boolean operator for the search. For each PICO element, the author collected any synonyms by connecting terms with “OR”, then located citations relevant to all of the PICO elements by linking with “AND”. The author searched for systematic reviews of randomized controlled trials (RCTs), high quality single randomized controlled trials, quasi-experimental studies and guidelines acquired from full text studies published in English from 2010 to 2014. The author evaluated the evidence- based practice by using the methods and criteria set for testing validity, reliability and applicability. The author originally collected 31 articles related to the study. Eventually, 5 evidences were selected for the study because the aforementioned met all of the evaluation criteria. Another 26 evidences were excluded, because they were not related to the objectives of the author’s study, did not provide specific measurement on caring for children with pneumonia, failed to provide updated information and were not published in English. Among the author’s selection of five evidences were includes three were quasi-experimental studies, one was a pre-experimental study and one was an international guideline.

From the five selected evidences the author found that majority of the evidences provide health education programs with group discussion about pneumonia management for mothers of children under 5 years of age.

Most of the evidences were provided health education interventions conducted by nurses in the hospitals. The health education programs increased the knowledge and practice of mothers of children under 5 years of age with pneumonia. Two types of health education are available for pneumonia management programs, namely, individual and group health education programs. Only one study provided individual education for one hour in the hospital. The researchers individually met with mothers and discussed the children's problems and needs. Two studies provided group education for one hour in the hospital**.** The researcher met with all of the mothers for discussion. The methods used in the health education consisted of lectures, group discussions, role play, demonstration and return demonstration. Three studies used lectures followed by discussions. Only two studies stated that they provided 60 minutes of lectures about the contents on pneumonia management. The education programs used booklets, flipcharts, posters and leaflets as media to instruct the mothers of children under 5 years of age. Only two studies stated that they provided 60 minutes of demonstration and return demonstration about the contents on pneumonia management. During the demonstration and return demonstration, the researchers used doll models and thermometers as equipment for practice. In addition, the researchers discussed methods for positioning the children, measuring temperature, clearing the airways and using nasal drops with the mothers.

The contents for pneumonia management programs were composed of both health promotion and pneumonia prevention. Only one evidence included content about child health promotion consisting of appropriate nutrition, exclusive breastfeeding, proper diet, immunization schedules, adequate rest, hygienic measures.
For the most part, the evidence identified the compotents of pneumonia prevention consisted of monitoring and assessment for children with pneumonia, caring for the children's symptoms and evaluation for children with pneumonia. The outcomes of education programs can be primarily assessed by evaluating mothers' knowledge and practice in caring for children with pneumonia. Maternal knowledge should cover the definition, etiology, risk factors, signs and symptoms, management and care,

immunization and prevention of pneumonia. The mothers' knowledge was measured by questionnaires and multiple choice questions. The mothers' practices were measured by asking questions with observational checklists and 3-point practice scales.

Limitations of the study

The evidence about pneumonia management program is limited. Hence, the author selected only five evidences, then the summarized and based her findings only a few studies. In addition, the levels of selected evidences were low (Level 2-4). Every evidence has some weak points. For example, three evidences did not identify the methods for providing the intervention. Two evidences did not provide the duration of the intervention or use media. However, all of the evidence used outcome measurement instruments developed by researchers, even though the instruments were not standardized.

4.2 SUGGESTIONS

The author would like to implement the pneumonia management program in the author's clinical setting in Bangladesh. The following strategies should be considered when implementing this program. Based on the research findings, it is recommended that parents of children with pneumonia under 5 years of age need to receive the pneumonia management program. The implementation of the pneumonia management program should be applied under the following criteria:

4.2.1 Implications for practice

1) The clinical practice guidelines of pneumonia management programs for improving knowledge and skills in caring for children with pneumonia should be developed using the recommendations derived from the evidence-based practice.

2) The guidelines should be applied according to the situation of the clinical settings in Bangladesh. The resources used to improve knowledge and skills for the parents arranging the pneumonia management program should be modified to suit the clinical practice environment.

3) The guidelines should be presented to the authority of the clinical setting and conduct a meeting with the hospital director, nursing superintendent, head of the department of the pediatric unit and head nurse of the pediatric unit.

4) The process of conducting pneumonia management programs should be as follows:

4.1 Programs for training the nurses should be arranged by the authorities before implementing the intervention.

4.2 The pneumonia management program simple, guidelines should be developed for parents of children under 5 years old.

4.3 Pneumonia management programs and accompanying materials should be developed for parents of children under 5 years old by surveying the knowledge, practice and needs of parents of children with pneumonia before implementation in a clinical setting.

4.4 The nurses should motivate the parents to participate in the pneumonia management program for future benefits of children under 5 years old.

4.5 Pneumonia management programs should be established in hospital-based settings, including inpatient and outpatient units. The programs should be implemented before discharge from the inpatient unit or at convenient times in outpatient units. Moroever, the programs should be conducted by nurses.

4.6 The content of the existing pneumonia management programs should be reviewed suitable for implementation. In addition, child health promotion and prevention of pneumonia should be covered.

4.7 To test the effectiveness of pneumonia management programs for children with pneumonia, the program should be disseminated to determine the outcomes of the program in other health care settings.

4.2.2 Implications for research

1. A pilot study should be conducted to test the effectiveness of the pneumonia management program prior to implementation the recommendations for the pneumonia management program to determine feasibility and appropriateness for pneumonia management in the clinical setting.

2. Research should be conducted to assess and increase parental knowledge about managing pneumonia children at home after participating in the pneumonia management program, and measure the secondary outcomes, such as incidence rate of pneumonia in children or readmission rate.

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