KNOWLEDGE AND PERCEPTION OF PNEUMONIA DISEASE AMONG MOTHERS OF CHILDREN UNDER FIVE YEARS ATTENDING NAKHON PATHOM GENERAL HOSPITAL, THAILAND

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ABSTRACT

A hospital based cross sectional study was conducted to describe socio-demographic factors of mothers, mother's knowledge and mother's perception of pneumonia disease. Study was conducted at Nakhon Pathom General Hospital, Thailand period 22 to 30 January 2007 by interviewing 140 mothers of children under five years attending a pediatric clinic by using structured questionnaire.

This study found mothers were predominantly primary school graduates (37.14 %). The majority worked as laborer (39.29 %) with medium level of family income per month (87.86 %). Around 66% of the mothers had fair knowledge about pneumonia. From this result, it was found that only a few mothers answered all the questions correctly in terms of simple signs and symptoms of pneumonia (7%) and around 21% of the mothers answered all the questions correctly in terms of cause and factors related with pneumonia. Around 81% of the mothers had good perception and only a small number of mothers gave correct answers for all the statements, which was only 7% of all the mothers. Finally, no significant associations were found among the occurrence of pneumonia, mother's knowledge and mother's perception.

The lack of knowledge among mothers about simple signs and symptoms of pneumonia, and also the lack of knowledge about its causes and factors related with pneumonia become important findings of this study. The low perception of perceived benefits became dominant among all the perception's dimensions of the four found in this study. Community based public health education and training for health providers at all levels about correct and applicable prevention and assessments of pneumonia and other dangerous diseases should be promoted to ensure better transfer knowledge, better perception and better health practices in the community.

KEY WORDS: KNOWLEDGE/ PERCEPTION/ MOTHERS/ PNEUMONIA/ CHILDREN UNDER FIVE YEARS

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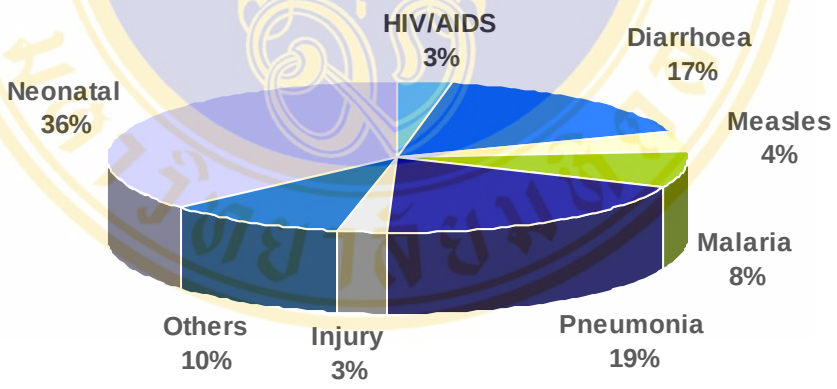
CHAPTER 1
INTRODUCTION

1.1 Rationale and Justification

Every day, millions of parents seek health care for their sick children, taking them to hospitals, health centres, pharmacists, doctors and traditional healers (1). Each year more than 10 million children die before they reach their fifth birthday. Seven in ten of these deaths are due to just five preventable and treatable conditions: pneumonia, diarrhoea, malaria, measles, and malnutrition, and often to a combination of these conditions (2).



Source: IMCI, Integrated Management of Childhood Illnesses. World Health Organization, 2005

Figure 1 Major causes of death among children under 5 years of age and neonates in the world, 2000-2003.

The new estimates (figure 1) show that worldwide, 73% of deaths in children younger than age 5 years are attributable to six causes: pneumonia (19%), diarrhea (18%), which includes 17% of deaths in children 1–59 months and 3% of neonatal

deaths), malaria (8%), neonatal sepsis or pneumonia (10%), preterm delivery (10%), and asphyxia at birth (8%). The four communicable disease categories account for more than half (54%) of all child deaths. Sepsis or pneumonia in neonates and pneumonia in older children constituted 29% of all deaths. Additionally, under nutrition is an underlying cause of 53% of all deaths in children aged younger than 5 years. The estimated proportions of deaths in which under nutrition is an underlying cause are roughly similar for diarrhea (61%), malaria (57%), pneumonia (52%), and measles (45%) (3,4).

The total numbers and proportional distributions of deaths in children younger than age 5 years by cause are also available for the six World Heath Organization (WHO)-defined regions; those are Africa, Americas, Eastern-Mediterranean, Europe, Southeast Asia and Western Pacific. Although WHO regional groupings of countries are not entirely consistent with epidemiological cause-of-death patterns for children younger than 5 (5), they do represent one of the important organizational frameworks guiding planning of public-health actions and are meaningful in that respect. Among deaths in children younger than age 5 years worldwide, 42% occur in the WHO Africa region, and an additional 29% occur in the Southeast Asia region. The major causes of deaths among children under 5 years in almost 6 WHO regions are still around of neonatal causes, pneumonia, malaria and diarrhea.

The result of this problem refers higher under five mortality rate (UMR) especially in South-East Asia. For examples in 2002, there are happened in Cambodia with UMR 138 deaths per 1000 children, Myanmar with UMR 109 per 1000 children, Lao PDR with 100 deaths per 1000 children, and Indonesia with 45 deaths per 1000 children (6).

Pneumonia is the most important cause of morbidity and mortality in children aged under 5 years worldwide (7). Pneumonia results in two million deaths each year among children worldwide (20% of all child deaths). Since pneumonia become one of the major causes of child deaths worldwide, it supports 30 till 70 percent child deaths higher in developing countries than those are in develop countries (8). More than 150

million episodes of pneumonia are estimated to occur every year among children under five in developing countries, accounting for more than 95% of all new cases worldwide. Between 11 and 20 million children with pneumonia will require hospitalization, and more than 2 million will die from pneumonia. South Asia and Sub-Saharan Africa have the highest incidence of pneumonia cases among children under five. These two regions combined bear the burden of more than half the total number of pneumonia episodes worldwide (9).

Until 2001, pneumonia still became the first cause of deaths among children under five years in Indonesia. It was reported about 22.8% of death of children under five years in 2001 caused by pneumonia (10). Meanwhile, there were 496,415 cases of pneumonia in children under five years in 2003, a reduction compared to the previous years, from 804,937 cases in 1999 and 532,742 cases in 2002.

But different case in Thailand, pneumonia was not the major cause of deaths among under five years children. In 2004 pneumonia morbidity rate was 205.63 per 100,000 populations and pneumonia mortality rate was only 1.66 per 100,000 populations (11). Many factors involved to decrease pneumonia morbidity and mortality rate among children under five years in Thailand. The population below poverty line is low, about 10% in 2004, that's one of factors that can reduce the occurrence of pneumonia. Health policy reformation in Thailand was also the crucial factor involved. But many factors can be described to develop pneumonia occurrence in many countries, those include Thailand (12).

Several risk factors for acquiring respiratory infections in developing countries, such as poverty, low family income, low parental education level, low birth weight, malnutrition, and lack of breastfeeding, have been described (13). Nutritional factors also influence risk of developing disease. This includes breast-feeding practice and knowledge among mothers.

Family size and household crowding have been linked to the risk of developing pneumonia; whereas the former also may be influenced by birth spacing and

nutritional factors, the latter is a consistent finding in developed and developing countries. Sanitation influences many health outcomes and might affect the risk of developing pneumonia directly or indirectly (14).

The incidence of pneumonia and bronchitis has been studied in 2205 infants over the first five years of life. In the same period their parents' smoking habits and respiratory symptoms were recorded annually (15). Those factors show that both host and environmental very important to lead pneumonia occurrence in children, and almost of risk factors of pneumonia among under 5 years children are in the family.

Another thing that should be concern is those factors could make the occurrence of pneumonia varies among those children. For example the incidence of pneumonia and bronchitis in the first year of life was associated with parents' smoking habits; incidence was lowest where both parents were non-smokers, highest where both smoked, and lay between these two levels where only one parent smoked. Over the age of one year the association was not consistent. And so on other factors have similar effect to lead severe pneumonia disease among under five children.

Preventing children from developing pneumonia in the first place is important for reducing deaths. Prevention efforts include many well-known child survival interventions including immunizing children (especially with measles, HIb and pneumococcal conjugate vaccines), ensuring adequate nutrition (including zinc intake and breastfeeding), and that reducing indoor air pollution may also play a role. But once a child develops pneumonia, prompt treatment with a full course of effective antibiotics is life-saving because most severe cases are caused by bacterial pathogens. And since access to health services is limited in many developing countries, prompt treatment may also require training health workers to diagnose and treat children with pneumonia in the community (15,16).

Studies show that community health workers can effectively manage uncomplicated pneumonia in the community. The case management they performed includes classifying suspected cases of pneumonia based on breathing rates and lower

chest wall indrawing (where the chest retracts during inhalation), treating non-severe pneumonia cases with antibiotics, and referring severe pneumonia cases to health facilities, where possible.

Community mothers mentioned a wide range of illness concepts in relation to breathing problems. Although the terminologies were not clear-cut, caretakers especially mothers were very articulate about the breathing problems and their explanations were consistent both within and between the different groups (16). This shows that mother's/caretaker's knowledge could be importance in preventing and assessing pneumonia among children in family. At least, mother's knowledge can be very important factors in reducing the occurrence of pneumonia in children under 5 years.

According to all the situations, conditions and a lot of factors involved of pneumonia disease in the world and Thailand, it's can be seen that Thailand has less occurrence of getting pneumonia among its children. But it's not been sure that community involvement, which can be included mothers knowledge regarding pneumonia assessment and prevention is important issue that supports for decreasing pneumonia occurrence in Thailand. Since there was no evidence of research in term of mother's knowledge and perception about pneumonia in Thailand, especially by using Integrated Management of Childhood Illness (IMCI) as guidance, it becomes necessary to conduct this research for providing information related with it.

1.2 Research Questions

What are the levels of knowledge and perception of pneumonia disease among mothers of children under 5 years attending Nakhon Pathom General Hospital, Thailand?

1.3 Research Objectives

1.3.1 General Objective:

To describe knowledge and perception of pneumonia disease among mothers of children under 5 years who are attending Nakhon Pathom General Hospital, Thailand.

1.3.2 Specific Objectives:

1.3.2.1 To describe socio-demographic factors of family (respondents' ages, marital status, economic status, education, occupation, number of children in family and family size) of children under 5 years who are attending Nakhon Pathom General Hospital, Thailand.

1.3.2.2 To describe knowledge of pneumonia disease (simple signs and symptoms of pneumonia; causes and factors related with pneumonia; simple assessments for pneumonia; and pneumonia prevention) among mothers of children under 5 years who are attending Nakhon Pathom General Hospital, Thailand.

1.3.2.3 To describe perception of pneumonia disease (perceived susceptibility, perceived severity, perceived barriers and perceived benefits) among mothers of children under 5 years who are attending Nakhon Pathom General Hospital, Thailand.

1.3.2.4 To describe the occurrence of pneumonia among children under 5 years at Nakhon Pathom General Hospital, Thailand.

1.3.2.5 To determine associations between the occurrence of pneumonia disease among children under five years and both mother's knowledge and mother's perception of pneumonia disease.

1.4 Conceptual Framework

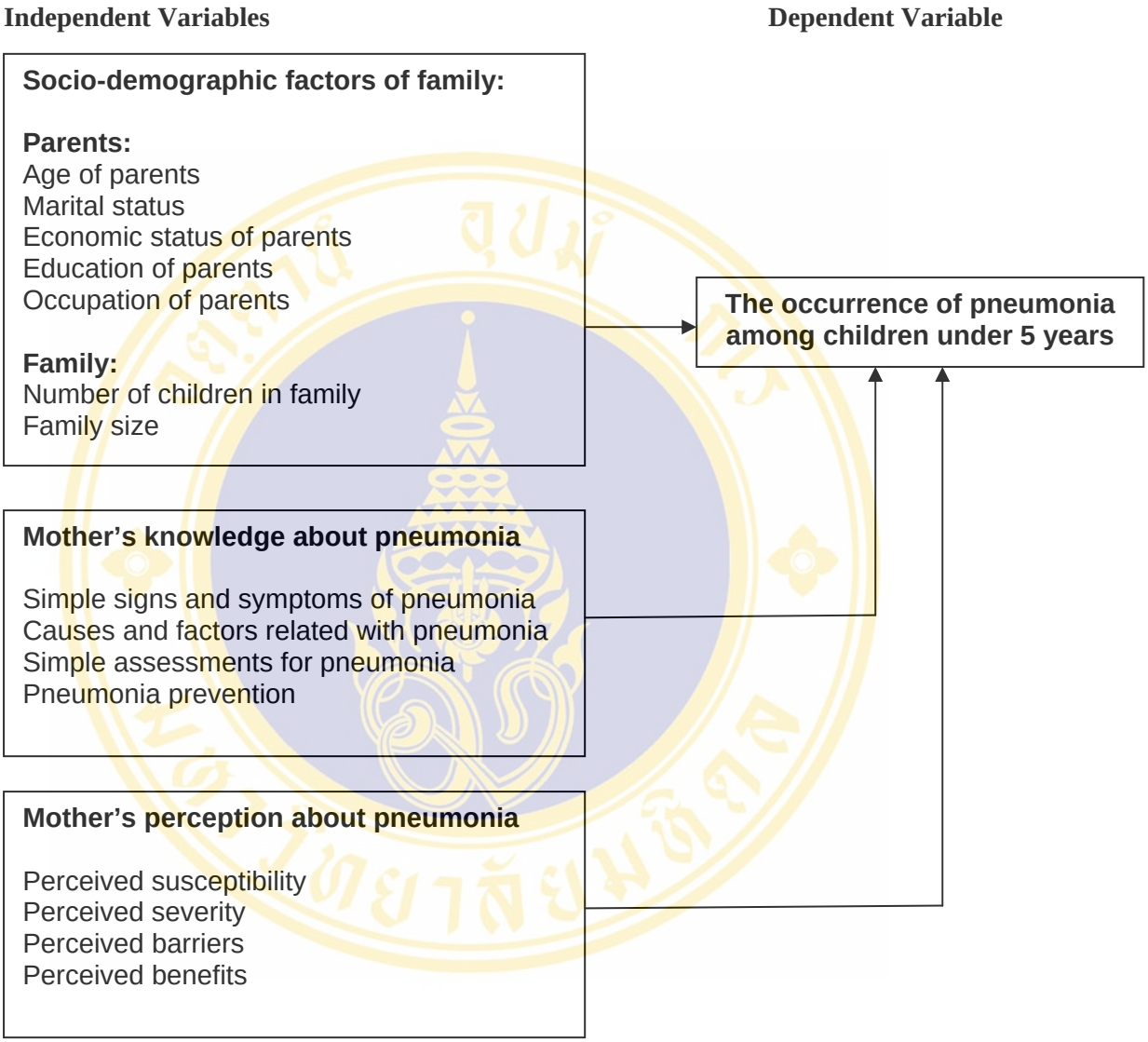


Figure 2 Conceptual framework

1.5 Operational Definition

Pneumonia

Pneumonia is an illness of the lungs and respiratory system in which the alveoli (microscopic air-filled sacs of the lung responsible for absorbing oxygen from the atmosphere) become inflamed and flooded with fluid. Pneumonia can result from a

variety of causes, including infection with bacteria, viruses, fungi, or parasites. In this study, pneumonia was diagnosed by physician according with physical symptom and sign also matched with IMCI classification. Pneumonia means if cough or difficult breathing's child has fast breathing (> 50 breath/minute). Severe pneumonia means if cough or difficult breathing's child has fast breathing (> 50 breath/minute), lower chest wall indrawing, and stridor.

IMCI (Integrated Management of Childhood Illness)

IMCI (Integrated Management of Childhood Illness) is strategy stemmed from the needs of curative care, the strategy also addresses aspects of nutrition, immunization, and other important elements of disease prevention and health promotion. The objectives of the strategy are to reduce death and the frequency and severity of illness and disability, and to contribute to improved growth and development.

Lower chest wall indrawing

Lower chest wall indrawing, defined as the inward movement of the bony structure of the chest wall with inspiration, is a useful indicator of severe pneumonia. It is more specific than "intercostal indrawing," which concerns the soft tissue between the ribs without involvement of the bony structure of the chest wall. Chest indrawing should only be considered present if it is consistently present in a calm child. Agitation, a blocked nose or breastfeeding can all cause temporary chest indrawing.

Stridor

Stridor is a harsh noise made when the child inhales (breathes in).

Children under 5 years

Children under 5 years in this research were children whose age between 2 months until 60 months.

Parents

Parents is a father and mother; ones who beget or ones who give birth to or nurture and raise a child; and play the role of guardian

Mother

Mother is the biological female parent of a child or offspring, while the male parent is the father. The maternal bond describes the feelings the mother has for her (or another's) child.

Age of parents

Age of parents was classified as the following less than 25 years old and equal or more than 25 years old.

Marital status

Marital status was classified as:

1. Living together means woman who usually lives with her husband or partner. Both of them can take care of their children
2. Single parent, means woman or man who lives alone and takes care of her/his children alone. It includes single, separate, and widow.

Economic status of parents

Economic status of parents is an average of total income of both mother and father of child. It was categorized as low, medium and high according to house hold income.

Education of parents

Education of parents is the highest educational attainment of each mother and father of child according to the education system. According the Thai formal education system, to classify education of parents in this research it was divided into six years primary school, three years of junior high school, three years of high school, and university/college. In this research also will be added: no schooling and other education of parents.

Occupation of parents

Occupation of parents is the employment of each mother and father of child in which spend most of their time during the year. We divided it into unemployment, government officer, trader, and worker in private company, labor, and others.

Family

Family consists of a domestic group of people (or a number of domestic groups), typically affiliated by birth or marriage, or by comparable legal relationships-including domestic partnership, adoption, surname and (in some cases) ownership (as occurred in the Roman Empire).

Number of children in the family

Number of children in the family means total amount of children whose parents have. We categorized 2 children or less and more than 2 children.

Family size

Family size is the number of people who were living in the same house. We classified as less than 5 family members, and equal or more than 5 family members.

Knowledge

Knowledge is gained either by experience, learning and perception or through association and reasoning. The term knowledge is also used to mean the confident understanding of a subject, potentially with the ability to use it for a specific purpose.

Mother's knowledge about pneumonia

Mother's knowledge about pneumonia was any mother's knowledge related about cause and risk factors of pneumonia referred from IMCI classification, and how to recognize and do action regarding child with pneumonia. We classified as good, fair and poor. That included simple signs and symptoms of pneumonia, causes and factors related with pneumonia, simple assessments for pneumonia and pneumonia prevention.

Perception

Perception comes from the latin word, capere, meaning to take, the prefix per- means 'completely'. In psychology and the cognitive sciences, perception is the process of acquiring, interpreting, selecting, and organizing sensory information. In this research, perception meant how the person thinks, prioritizes and reacts to some problems.

Mother's perception about pneumonia

Mother's perception about pneumonia in this research was used Health Belief Model as guidance. The result was described as good, fair, and poor perception depends on the collected scores. That included perception about:

1. Perceived susceptibility (mother's perception of her children risk to getting pneumonia)
2. Perceived severity (mother's perception of the seriousness of the pneumonia condition, and its potential consequences)
3. Perceived barriers (mother's assessment of the influences that facilitate or discourage adoption of the promoted behavior according pneumonia prevention and asssessment)
4. Perceived benefits (mother's assessment of the positive consequences of adopting the pneumonia assessment and prevention).

The occurrence of pneumonia among children under 5 years

The occurrence of pneumonia among children under 5 years is the prevalence of getting pneumonia or not getting pneumonia among children between 2 months and 60 months. This also included history of getting pneumonia for 60 months of children life.

1.6 The Limitations of The Study

1.6.1 This study could not be generalized to bigger population according the respondents whom were used are in specific condition, such as there were only patients' mothers in hospital.

1.6.2 This study found only 4 mothers whose their children had diagnosed having pneumonia. So, it was difficult to analyzed further about pneumonia occurrence in Nakhon Pathom General Hospital

1.6.3 Other conditions of children or mothers influenced respondents to respond to interviews. Accuracy of the collected informations and answers depended on the conditions of mothers and children.

1.6.4 The short time frame of this study influenced the determination of sample technique and finally that influenced validity of the results if it was generalized.

1.7 Usefulness of Research

1.7.1 This research provided some information about based line data of knowledge and perception about pneumonia among mothers of children under five years..

1.7.2 This research provided sources of data for further research studies.

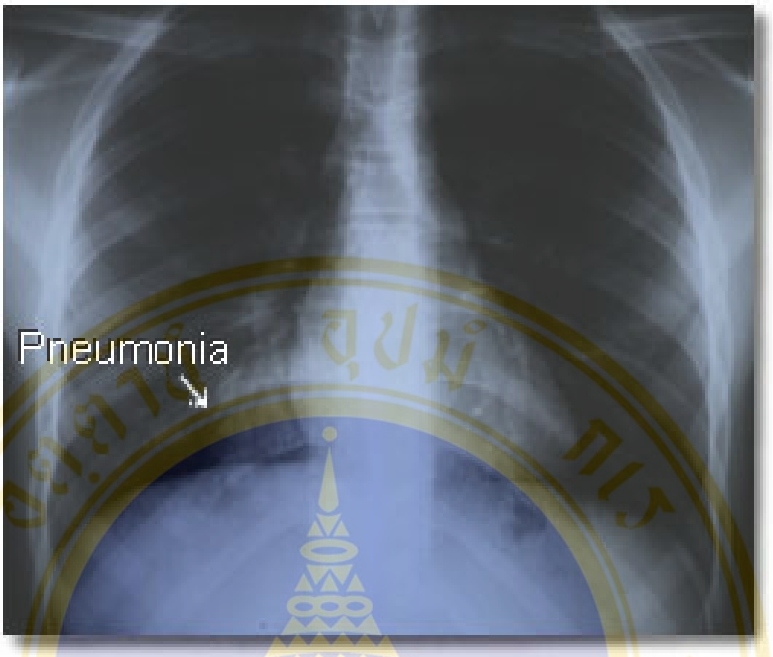
CHAPTER 2
LITERATURE REVIEW

2.1 Pneumonia

Pneumonia is inflammation of lung parenchyma may involve the pleura, interstitial and airway, and also include alveolar consolidation (18). Pneumonia can result from a variety of causes, including infection with bacteria, viruses, fungi, or parasites. Pneumonia may also occur from chemical or physical injury to the lungs, or indirectly due to another medical illness, such as lung cancer or alcohol abuse. Typical symptoms associated with pneumonia include cough, chest pain, fever, and difficulty breathing. Diagnostic tools include x-rays and examination of the sputum. Treatment depends on the cause of pneumonia; bacterial pneumonia is treated with antibiotics.

Pneumonia is a general term that refers to an infection of the lungs, which can be caused by a variety of microorganisms, including viruses, bacteria, fungi, and parasites (19, 20). Pneumonia is an illness of the lungs and respiratory system in which the alveoli (microscopic air-filled sacs of the lung responsible for absorbing oxygen from the atmosphere) become inflamed and flooded with fluid. Although different types of pneumonia tend to affect children in different age groups, pneumonia is most commonly caused by viruses. Some viruses that cause pneumonia are adenoviruses, rhinovirus, influenza virus (flu), respiratory syncytial virus (RSV), and Para influenza virus (the virus that causes croup).

Pneumonia also can be defined based on IMCI as cough or difficult breathing in children under five years with fast breathing, or lower chest indrawing/ stridor and with/without danger sign/s (21). This term is more popular in community and public health workers.



Source: http://www.kidshealth.org/parent/infections/bacterial_viral/pneumonia.html. Accessed on 8 November 2006.

Figure 3 Chest X-ray result of children with pneumonia disease.

2.2 Mother's Knowledge about Pneumonia

According to disease control and prevention program those were launched at WHO joint statement 1985, mothers should have knowledge about pneumonia and its managements to decrease morbidity and mortality of pneumonia in children (22). As many children who die of pneumonia at home without seeking prior care at formal health facilities (23), the ARI case management algorithm was developed to suit community health workers (CHW)(24).

Other research also shows the importance of knowledge of community health workers or mothers to reducing pneumonia occurrence in community. The CHWs were found to be capable of acquiring the skills needed to effectively manage ARI cases in accordance with the WHO ARI case management strategy. It was also found important that training emphasize how to count the respirations of children with

tachypnea and how to identify chest indrawing. These competency-based methods should prove useful in other community-based health interventions (25).

Experience shows that with early detection and treatment at the community level, could halve ARI mortality in children and significantly reduce overall child mortality (26). The involvement of mothers and community heath workers in pneumonia detection, assessment and prevention becomes important factor in reducing morbidity and mortality of pneumonia in children. Therefore knowledge about pneumonia among mothers and community health workers is needed to supports their activities. While a policy for community use of antibiotics similar to the anti-malarial policy would have implications for resistance development and drug side-effects there is scope for significant gains; a recent meta-analysis found that community management of pneumonia in non-malarias areas has reduced under-five mortality by 24% (27).

From previous study in Vietnam, it's shown about 43% mothers had good knowledge on ARIs include pneumonia, 43.3% had fair knowledge and 16.8% had poor knowledge. The knowledge of mothers has significant association with the care toward children and child care practice. That has direct influence to the occurrence of pneumonia in family (28).

Some other research found that mother knowledge about pneumonia disease is very important for pneumonia prevention and management in family. Several illness concepts were used depending on the magnitude of the problem and the symptoms observed in the child. Of these, the eight most distinct are summarized. Of the bio-medically relevant ARI symptoms, only hot body (fever), cough and fast breathing had analogues in the local language Lukonzo. For illness signs without analogues, the symptom characteristics were instead described by the mothers (16).

In this research mother's knowledge of pneumonia disease will describe as mother's knowledge about simple sign and symptom of pneumonia, cause and factors related with pneumonia, simple assessment for pneumonia and pneumonia prevention.

2.3 Signs and Symptoms of Pneumonia

Symptoms of pneumonia vary, depending on the age of the child and the cause of the pneumonia (29). Some common symptoms include:

1. Fever
2. Chills
3. Cough
4. Unusually rapid breathing
5. Breathing with grunting or wheezing sounds
6. Labored breathing that makes a child's rib muscles retract (when muscles under the rib cage or between ribs draw inward with each breath)
7. Vomiting
8. Chest pain
9. Abdominal pain
10. Decreased activity
11. Loss of appetite (in older children) or poor feeding (in infants)
12. In extreme cases, bluish or gray color of the lips and fingernails

People with infectious pneumonia often have a cough that produces greenish or yellow sputum and cause a high fever that may be accompanied by shaking chills. Shortness of breath is also common, as is pleuritic chest pain, a sharp or stabbing pain, either felt or worse during deep breaths or coughs. People with pneumonia may cough up blood, experience headaches, or develop sweaty and clammy skin. Other symptoms may include loss of appetite, fatigue, blueness of the skin, nausea, vomiting, and joint pains or muscle aches. Less common forms of pneumonia can cause a variety of other symptoms. For instance, pneumonia caused by Legionella may cause abdominal pain and diarrhea, while pneumonia caused by tuberculosis or Pneumocystis may cause only weight loss and night sweats. In elderly people the manifestations of pneumonia may not be typical. Instead, they may develop new or worsening confusion or may experience unsteadiness leading to falls. Infants with pneumonia may have many of the symptoms above, but in many cases, they are simply sleepy or have decreased appetite.

Rapid breathing is important sign of pneumonia in children. Sometimes when the pneumonia takes place in the lower part of the lungs near the abdomen, there may be no breathing problems at all, but there may be fever and abdominal pain or vomiting.

Many criteria can be used to determine rapid breathing in children. IMCI gives a practical classification to determine it. It's related to age of children and it can be seen in tables below.

Table 1 Fast breathing criteria in children 2 months until 5 years of age.

Child's Age	Cut-off Rate for Fast Breathing
2 months up to 12 months	50 breaths per minute or more
12 months up to 5 years	40 breaths per minute or more

Source: World Health Organization IMCI, Integrated management of childhood illnesses; Model chapter for textbooks. WHO, 2005.

For pneumonia that is caused by bacteria, infected child usually becomes sick relatively quickly and experiences the sudden onset of high fever and unusually rapid breathing. Different symptom if pneumonia is caused by viruses, symptoms tend to appear more gradually and are often less severe than in bacterial pneumonia. Wheezing may be more common in viral pneumonia.

Some types of pneumonia cause symptoms that give important clues about which germ are causing the illness. For example, in older children and adolescents, pneumonia due to Mycoplasma (also called walking pneumonia) is notorious for causing a sore throat and headache in addition to the usual symptoms of pneumonia. In infants, pneumonia due to chlamydia may cause conjunctivitis (pinkeye) with only mild illness and no fever. When pneumonia is due to whooping cough (pertussis), the

child may have long coughing spells, turn blue from lack of air, or make a classic "whoop" sound when trying to take a breath.

To assess illnesses in children under five years, IMCI classifies pneumonia as part of cough and difficult breathing. Those include danger signs those should be concerned by mothers and public health workers. If a child has one or more of these signs, s/he must be considered seriously ill and will almost always need to be sent to hospital. The following danger signs should be routinely checked in all children (30).

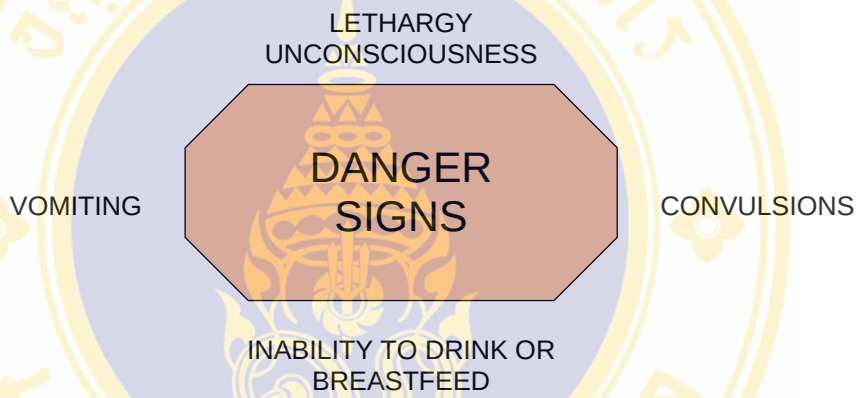


Figure 4 Danger Sign

1. The child has had convulsions during the present illness. Convulsions may be the result of fever, or serious health problem such as meningitis, cerebral malaria or other life-threatening conditions. All children who have had convulsions during the present illness should be considered seriously ill.
2. The child is unconscious or lethargic. An unconscious child is likely to be seriously ill. A lethargic child, who is awake but does not take any notice of his or her surroundings or does not respond normally to sounds or movement, may also be very sick. These signs may be associated with many conditions.
3. The child is unable to drink or breastfeed. A child may be unable to drink either because s/he is too weak or because s/he cannot swallow. Do not rely completely on the mother's evidence for this, but observe while she tries to breastfeed or to give the child something to drink.

4. The child vomits everything. The vomiting itself may be a sign of serious illness, but it is also important to note because such a child will not be able to take medication or fluids for rehydration.

A child presenting with cough or difficult breathing should first be assessed for general danger signs. This child may have pneumonia or another severe respiratory infection.

Three key of simple clinical signs are used to assess a sick child with cough or difficult breathing: (31)

1. Respiratory rate, which distinguishes children who have pneumonia from those who do not;
2. Lower chest wall indrawing, which indicates severe pneumonia; and
3. Stridor, which indicates those with severe pneumonia who require hospital admission.

No single clinical sign has a better combination of sensitivity and specificity to detect pneumonia in children under 5 than respiratory rate, specifically fast breathing. Even auscultation by an expert is less sensitive as a single sign. In general term, fast breathing is unusual frequency of breathing of children that presents in the calm child.

Lower chest wall indrawing, defined as the inward movement of lower chest with inspiration, this will involved lower ribs movement of chest, is a useful indicator of severe pneumonia. It is more specific than “intercostal indrawing,” which concerns the movement between the ribs. Chest indrawing should only be considered present if it is consistently present in a calm child. Agitation, a blocked nose or breastfeeding can all cause temporary chest indrawing (30, 31).

Stridor is a harsh noise made when the child inhales (breathes in). Children who have stridor when calm have a substantial risk of obstruction and should be referred. Some children with mild croup have stridor only when crying or agitated. This should not be the basis for indiscriminate referral. Sometimes a wheezing noise is heard

when the child exhales (breathes out). This is not stridor. A wheezing sound is most often associated with asthma. Experience suggests that even where asthma rates are high, mortality from asthma is relatively uncommon. Stridor related with extra pulmonary obstruction but wheezing is caused by intra pulmonary obstruction (32).

Based on a combination of the above clinical signs, children presenting with cough or difficult breathing can be classified into three categories: (33)

Those who require to be sent immediately to hospital for possible SEVERE PNEUMONIA OR VERY SEVERE DISEASE. This group includes children with any general danger sign, or lower chest indrawing or stridor when calm. Children with SEVERE PNEUMONIA OR VERY SEVERE DISEASE most likely will have invasive bacterial organisms and diseases that may be life-threatening.

- Any general danger sign or - Chest indrawing or - Stridor in calm child	SEVERE PNEUMONIA OR VERY SEVERE DISEASE

Those also require to be sent immediately to hospital because they are highly likely to have bacterial PNEUMONIA. This group includes all children with fast breathing. Fast breathing, as defined by WHO, detects about 80 percent of children with pneumonia who need antibiotic treatment and need hospital care.

- Fast breathing	PNEUMONIA

Those who simply have a COUGH OR COLD. Such children may require a safe remedy to a relieve cough. A child with cough and cold normally improves in one or two weeks. For this case children is not necessary to be sent to hospital. Private medical clinics and health centres can handle this problem.

- No signs of pneumonia or very severe disease	NO PNEUMONIA: COUGH OR COLD

2.4 Risk Factors of Pneumonia

Both host and environment contribute to the risk that a child will develop pneumonia in the first few years of life. Numerous study designs, including case-control, cohort, and longitudinal surveillance approaches, have been applied to identifying risk factors for acquiring pneumonia in the developing world.

Risk factors that increase the incidence and severity of lower respiratory infection in developing countries include large family size, lateness in the birth order, overcrowding, low birth weight, malnutrition, vitamin A deficiency, lack of breastfeeding, pollution include passive smoking and young age (34, 35). The other risk factors for ARI (Acute Respiratory Tract Infection) morbidity, include pneumonia, were low socioeconomic status and age less than one year. Malnutrition and a positive culture of blood were significantly risk factors for mortality. These identified risk factors underscore the value of primary health care interventions, such as the standard ARI case management, immunization, health education, promotion of breast-feeding, and vitamin A supplementation, as strategies for reducing ARI mortality in developing countries (36).

In a study from Pakistan, malnutrition (wasting), younger age, low immunisation rate and early childhood respiratory damage were significant factors for the development of pneumonia (37). The research shows that malnutrition, younger age, low coverage of immunization and also early childhood mismanagement and respiratory damage were found to be significant factors for development of pneumonia. Almost similar with Pakistan, study in Kerala, India shows that the significant factors on univariate analysis were parental education, environmental pollution, discontinuation of breastfeeding in young infants, malnutrition, hypovitaminosis A, low birth weight, previous history of severe ARI, unresponsiveness to earlier treatment, and use of non-allopathic medicine. Correction of these factors can probably reduce mortality due to ARI (38).

The environment factors vary from each other, and might increase susceptibility to developing pneumonia in under five years children. Indoor air quality, as indicated by type of cooking fuel used, ventilation, and passive cigarette smoke, appears to be related to the frequency of episodes of pneumonia in children in developing countries. Both family size and household crowding have been linked to the risk of developing pneumonia; whereas the former also may be influenced by birth spacing and nutritional factors, the latter is a consistent finding in developed and developing countries. Poverty is linked with higher rates of pneumonia, but this rate may reflect a combination of nutritional, environmental, and behavioural influences. Sanitation influences many health outcomes and might affect the risk of developing pneumonia directly or indirectly. Interventions promoting hand washing have resulted in reductions in respiratory illness in children, although studies have been too small to identify impact on lower respiratory infections, and hand washing may be more effective in reducing viruses compared with respiratory bacteria (14). Study in urban slum community of Calcutta. Incidence of ARI was found significantly higher in undernourished children of poor socio-economic class. Parental smoking habit and solid fuel use for cooking were recognised as important risk factors of ARI (39). These factors, largely manifestations of poverty, were found to be instrumental in Bangladeshi children as well (40).

Breastfeeding tended to be protective for lower respiratory tract infections. The population-attributable risk of lower respiratory tract infections associated with passive smoking and child-care centres was 47% and 48%, respectively (29), Compared with exclusive breastfeeding in the first few months of life, partial or no breastfeeding was associated with a 2.23-fold higher risk of infant deaths resulting from all causes and 2.40- and 3.94-fold higher risk of deaths attributable to ARI and diarrhea (41). The data from other research also suggest that the risk of mortality associated with no breastfeeding was greater for low-birth-weight infants and infants whose mothers had little formal education. After age six months, the protective effects of breastfeeding dropped dramatically (42). These show the importance of promoting breastfeeding, especially during the first six months of life, and more targeting to

high-risk groups such as low-birth-weight babies and those of low socioeconomic status in pneumonia prevention and promotion programs (35).

The risk factors associated with increased mortality have also been investigated. Children with ALRI (Acute Lower Respiratory Tract Infection) who are below 1 year of age, are unable to feed, have loose stools and/or severe malnutrition were found to be at higher risk of death during an acute episode (43). Co-existing measles also increases mortality (44).

Co morbidities, in particular HIV infection, are major risk factors for the acquisition of pneumonia in developing countries. Recent studies in South Africa conducted in the context of a placebo-controlled vaccine trial estimated that hospitalization for pneumococcal bacteremic lower respiratory tract infection among HIV-infected infants who were 2 to 24 months old occurred at a rate of 1233/100,000 compared with a rate of 29/100,000 among uninfected children (45).

2.5 Simple Assessments for Pneumonia

There is no assessment that can be done by mother/care taker for pneumonia, except to recognize sign and symptom and sends the children to take medical care immediately. Children may be hospitalized for treatment if they have pneumonia caused by pertussis or other bacterial pneumonia that causes high fevers and respiratory distress. They may also be hospitalized if supplemental oxygen is needed, if they have lung infections that may have spread into the bloodstream, if they have chronic illnesses that affect the immune system, if they are vomiting so much that they cannot take medicine by mouth, or if they have recurrent episodes of pneumonia.

But for home treatment after the children take medical care from hospital, the mother/care taker can give antibiotics and other drugs those have doctor prescribed on schedule for as long as the doctor directs. This will help the child recover faster and will decrease the chance that infection will spread to other household members. Prohibit eat when the child is not feeling well to eat and encourage the child to drink

fluids if fever is present, is better to do. If the child has chest pain, try a heating pad or warm compress on the chest area. Take the child's temperature at least once each morning and each evening, and call the doctor if it goes above 102 degrees Fahrenheit (38.9 degrees Celsius) in an older infant or child, or above 100.4 degrees Fahrenheit (38 degrees Celsius) in an infant under 6 months of age. Checking child's lips and fingernails to make sure that they are rosy and pink, not bluish or gray, which is a sign that your child's lungs are not getting enough oxygen.

2.6 Pneumonia Prevention

In general, pneumonia is not contagious (19), but the upper respiratory viruses that lead to it are, so it is best to keep the child away from anyone who has an upper respiratory tract infection. Preventing infection with keeping someone's drinking glass and eating utensils separate from those of other family members if he or she has respiratory infection or sore throat, and wash hands frequently, especially after handling used tissues or dirty handkerchiefs.

Keeping children from harmless environment such as smoking habit of other family members, using safe cooking fuel (46), poor sanitation and air pollution, can be useful to prevent children getting pneumonia (47). Therefore, mother's knowledge about pneumonia is very important to prevent pneumonia occurrence in children.

2.7 Mother's perception about Pneumonia

Perception of illness appeared to be a factor that influence mother to react to illness. Some mothers attributed to supernatural causes and seek indigenous healer to cure the illness. As the study reported in 1989, almost mothers had traditional beliefs according the cause of pneumonia and other respiratory infections (48). Those influence mothers to react and seek treatment for children with pneumonia.

Study in the Northern of Thailand showed different scene of pneumonia or respiratory infections. Fever is believed by mothers to be related to human behavior

and physical stress and considered to be a mild form of illness. Spirits has been related to fever but it's considered secondary to physical stress and human behavior. The ceremonies to appease evil spirits are used only for mental or spiritual support and not to cure illness (49).

However, education can change mother's perception and practices according to the illness. Study in Gambia rural population showed that even in poorly educated population in which traditional medical beliefs and practices are wide spread, it might be possible to educated mothers to identify lower respiratory infections and to seek early treatment. According to those situations, community education should play a major role in all national control programs and may be critical determinants of the success of case management strategies in preventing pneumonia related mortality in children (50).

2.8 Theoretical Model

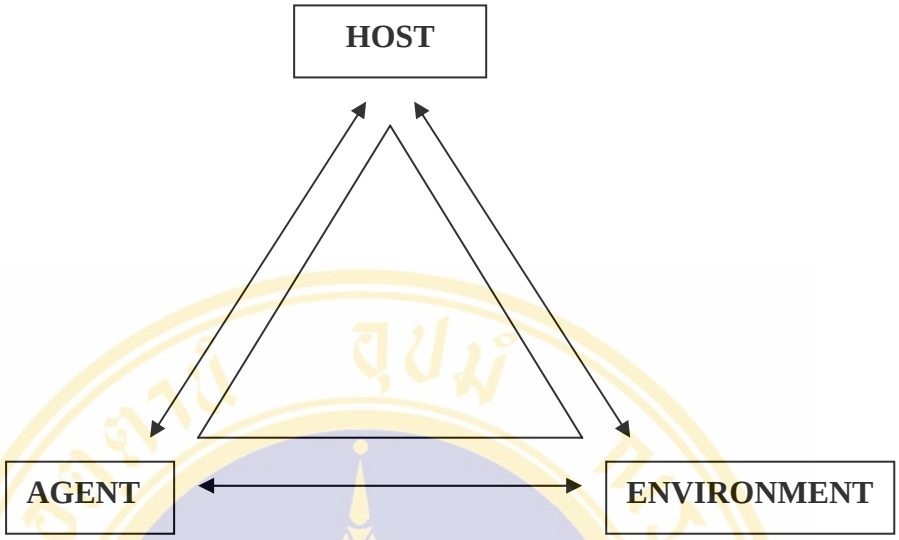
For determining factors related to pneumonia among children under 5 years, epidemiological triangle is used regarding many factors included. Host (the children), agent, and environment are found in leading pneumonia occurrence in the children. But specially for determining mother's perception of pneumonia disease, it's used Health Belief Model as guidance.

2.8.1 Epidemiologic Triangle

The Epidemiologic Triangle is a model that scientists have developed for studying health problems. The Triangle has three corners (called vertices): (51)

- Agent, or microbe that causes the disease (the "what" of the Triangle)
- Host, or organism harboring the disease (the "who" of the Triangle)
- Environment, or those external factors that cause or allow disease transmission (the "where" of the Triangle)

A disease is the product of a human host, an infectious agent or other type of agent, and the environment that promotes the exposure (52).



Source: www.bam.gov/teachers/activities/epi_1_triangle.pdf. 20 September 2006

Figure 5 Epidemiological Triangle

The agent is the cause of the disease. Beside other kinds of agents, the most common agent is a microbe—an organism too small to be seen with the naked eye. Disease-causing microbes are bacteria, virus, fungi, and protozoa (a type of parasite). They are what most people call “germs.”

Hosts are organisms, usually humans or animals, which are exposed to and harbor a disease. Host is a person or other living animal, which affords subsistence or lodgment to an infectious agent under natural condition (53). The host can be the organism that gets sick, as well as any animal carrier (including insects and worms) that may or may not get sick. Although the host may or may not know it has the disease or have any outward signs of illness, the disease does take lodging from the host. The “host” heading also includes symptoms of the disease. Different people may have different reactions to the same agent. Almost children under five years becomes host for many dangerous diseases, those include pneumonia as the major cause of deaths in children.

The environment is the favorable surroundings and conditions external to the host that cause or allow the disease to be transmitted or can support the disease to

occur. Some diseases live best in dirty water. Others survive in human blood. For this case, many environmental factors involved to occur pneumonia in children under 5 years. Careless of mother/care taker and insufficient conditions surround the children become important factors those related with the occurrence of pneumonia. Lack of knowledge and wrong perception of mother/care taker become key factor to support pneumonia occurrence in children.

In the center of the Triangle is time. Most infectious diseases have an incubation period: the time between when the host is infected and when disease symptoms occur. Or, time may describe the duration of the illness or the amount of time a person can be sick before death or recovery occurs. Time also describes the period from an infection to the threshold of an epidemic for a population.

From this theory and using previous research, it can be generate a basic concept about factors related with pneumonia disease as can be seen in figure 6. This figure shows the relationship among Host (children under five years), Agent (the germ) and Environment surround the children, that can develop the occurrence of pneumonia in children. Variety of agents, infectivity, pathogenicity, virulence, and dose of germ are preconditions or factors those can induce pneumonia in children. The condition of children also becomes important factor that can generate pneumonia. Those are age of children, gender, birth weight, breastfeeding practice of mother, and also nutritional status, immunization status and disease history of the children. The most important of environmental condition that can influence pneumonia occurrence is mother knowledge and perception about pneumonia.

According to all the factors those are involved to develop pneumonia occurrence based on literatures, it can be summarized as figure follows.

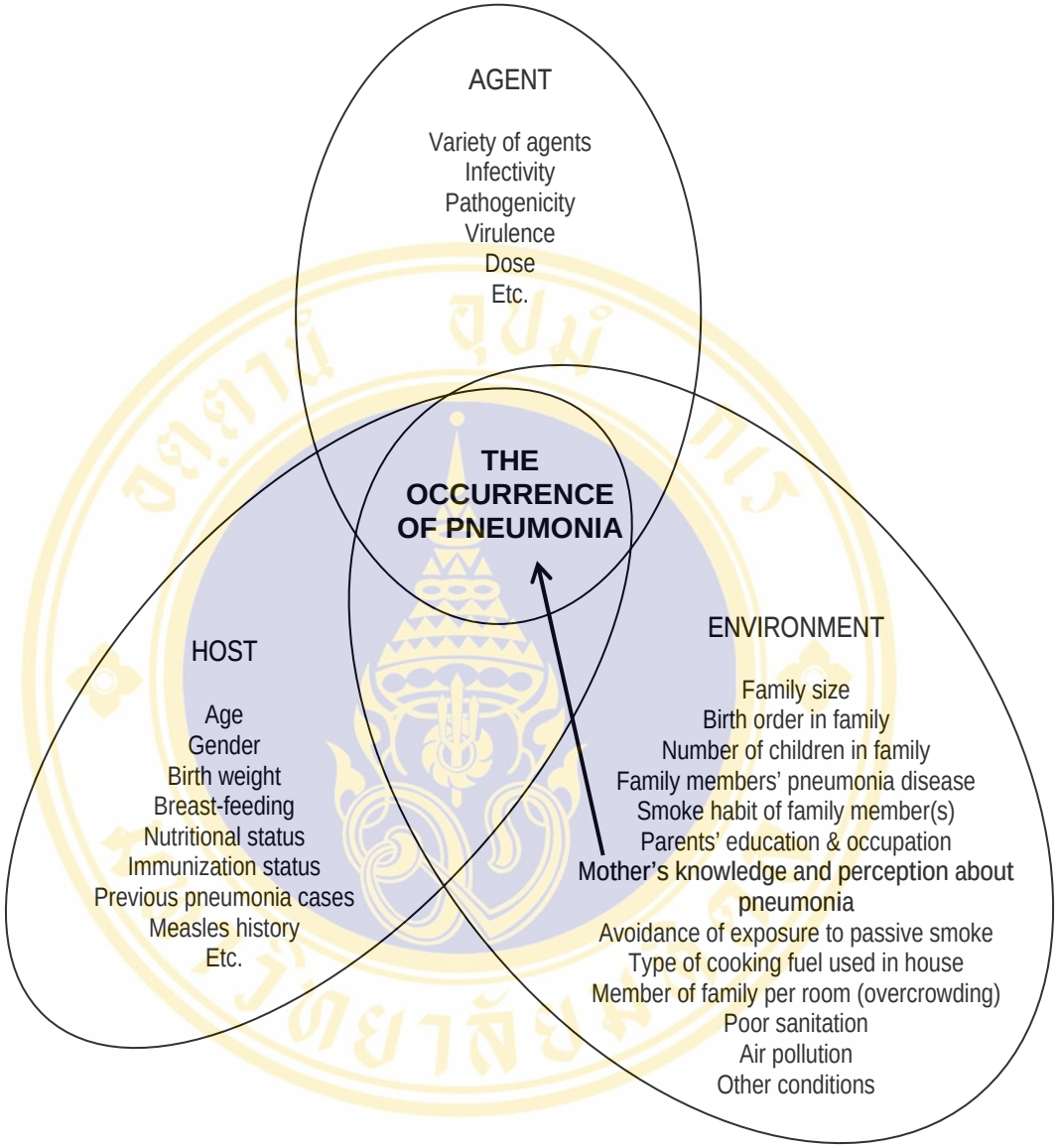


Figure 6 Basic concept of pneumonia occurrence in children.

This figure shows that mother's knowledge and perception as one of all factors those are involved to develop the occurrence of pneumonia disease among children under five years.

2.8.2 Health Belief Model

The Health Belief Model is a psychological model that attempts to explain and predict health behaviors (54). This is done by focusing on the attitudes and beliefs of individuals. The HBM was spelled out in terms of four constructs representing the

perceived threat and net benefits: perceived susceptibility, perceived severity, perceived benefits, and perceived barriers.

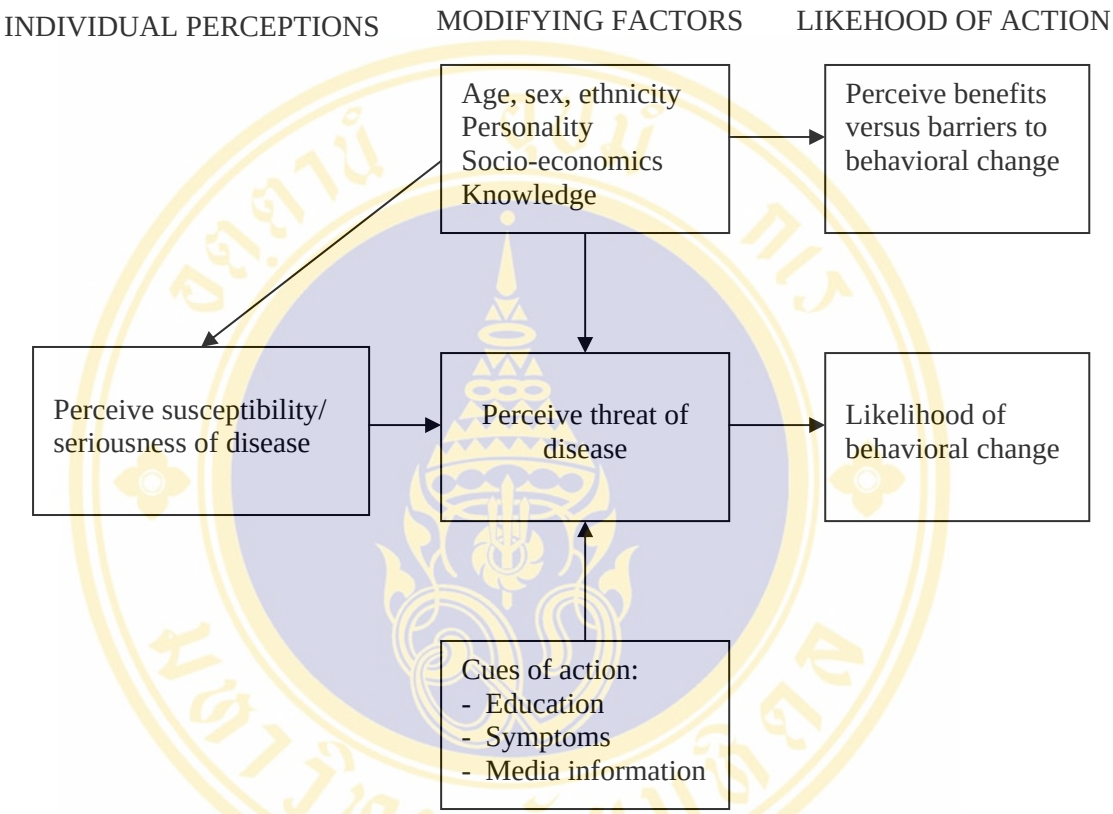
Table 2 Concepts, definitions and applications of Health Belief Model

Concept	Definition	Application
Perceived susceptibility	One's opinion of chances of getting a condition	Define population(s) at risk, risk levels; personalize risk based on a person's features or behavior; heighten perceived susceptibility if too low.
Perceived severity	One's opinion of how serious a condition and its consequences are	Specify consequences of the risk and the condition
Perceived benefits	One's belief in the efficacy of the advised action to reduce risk or seriousness of impact	Define action to take; how, where, when; clarify the positive effects to be expected.
Perceived barriers	One's opinion of the tangible and psychological costs of the advised action	Identify and reduce barriers through reassurance, incentives, assistance.
Cues to action	Strategies to activate "readiness"	Provide how-to information, promote awareness, reminders.
Self-efficacy	Confidence in one's ability to take action	Provide training, guidance in performing action.

Source: Theory at a Glance: A Guide for Health Promotion Practice (1997)

These concepts were proposed as accounting for people's "readiness to act." An added concept, cues to action, would activate that readiness and stimulate overt behavior. A recent addition to this model is the concept of self-efficacy, or one's

confidence in the ability to successfully perform an action. This concept was added by Rosenstock and others in 1988 to help the HBM better fit the challenges of changing habitual unhealthy behaviors, such as being sedentary, smoking, or overeating (55).



Source: Glanz et al, 2002, p. 52

Figure 7 Conceptual model of Health Belief Model

But in this research, Health Belief Model was not used for develop research conceptual framework according to the difference of dependent variable that should be used (not behavioral change but disease occurrence). But it was adopted only four concepts of health belief model to describe mother's perception about pneumonia. These were:

1. Perceived susceptibility means mother's perception of her children risk to getting pneumonia.

2. Perceived severity means mother's perception of the seriousness of the pneumonia condition, and its potential consequences.
3. Perceived barriers mean mother's assessment of the influences that facilitate or discourage adoption of the promoted behavior according pneumonia prevention and asssessment.
4. Perceived benefits mean mother's assessment of the positive consequences of adopting the pneumonia assessment and prevention.

CHAPTER 3
RESEARCH METHODOLOGY

3.1 Research Design

The study design is cross sectional study entitled knowledge and perception of pneumonia disease among mothers of children under five years who were attending at Nakhon Pathom General Hospital, Thailand. The data was collected by interviewing mothers who took their children to Nakhon Pathom General Hospital, Thailand, based on questionnaire.

3.2 Study Population

The study population of this research was all mothers of patients whose age 2 – 60 months who were attending at Nakhon Pathom General Hospital, Thailand.

Sample of population in this research included all mothers of children under five years (2 – 60 months) who were attending at Nakhon Pathom General Hospital, Thailand from January 22-30, 2007.

3.3 Study Site

For study site in this research, hospital was decided as source of data. As institution for medical care services, hospital become important place to arrived when people have health problems. Its catchment area makes hospital varies and more spesific to its community surrounded from others. But it should be mentioned that there will more variations of the communities for each catchment area those will be found who use each hospital. So, it might be assumed even though can not be generalized that the patients of hospital represent the people who surround it and also have health problems. In this research, mothers of under five years patients in hospital

were respondents to cover all the variation among people who surrounded it without search from specific communities.

This study was planned to conduct in Nakhon Pathom province. It was decided one general hospital in that province as source of data, which is Nakhon Pathom General Hospital. The various characteristic of mothers as respondents were tolerated. With more than 20 mothers who took their under five year's children to pediatric clinic per day, this hospital was enough to provide all respondents for this research.

3.4 Sample size and Sampling Technique

3.4.1 Sample Size

Sample size was determined by the following formula: (56)

$$n = \frac{Z^2 P (1-P)}{d^2}$$

Z = reliability of coefficient based on the level of confidence ($\alpha = 0.05$, $z = 1.96$)

d = absolute deviation from estimate rate that would be tolerated from the truth value ($d = 0.05$)

P = estimated of rate (as percentage) at which characteristic occurs in population. ($p=0.14$)

$$n = \frac{(1.96)^2 \times 0.14 \times 0.86}{(0.06)^2} = 128.480$$

The data from previous study in Thailand showed that proportion of children under five years who had respiratory infection in Nakhon Pathom province was 14% (57, 58). With 95% confidence of the study, the estimated sample size is 128.480. That means at least the total sample size should be not less than 129 mothers. In this study, 140 mothers (8.52% extra) were chosen for interviews as respondents.

3.4.2 Sampling Technique

Sample of this study was selected from mothers of children (aged 2 – 60 months) in pediatric clinic at hospital from January 22-30 2007. This also included mothers of children (aged 2 – 60 months) whose children were diagnosed as pneumonia and they were sent to pediatric ward.

According to the limited amount of mothers who brought their children to hospital, it was decided to use quota sampling method to collect data until the sample size is completed by January 30, 2007.

The sampling technique that used in this research will be described as figure below.

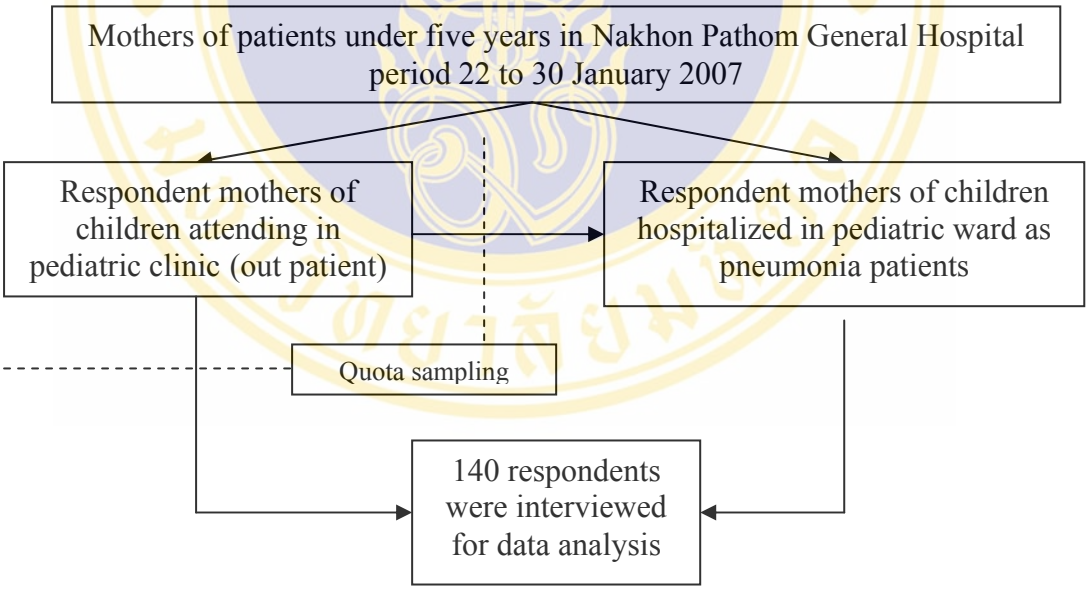


Figure 8 Sampling technique

3.5 Research Instrument

The instrument used for data collection was structured questionnaire which was covered knowledge and perception of pneumonia disease. Interviews were conducted by interviewers.

The questionnaire was prepared in English and was translated in to Thai language. The questionnaire had been tested for its validity by the experts before pre testing. Pre testing was conducted at Phuttamonthon community hospital which respondents had similar characteristics with Nakhon Pathom General Hospital on January 15, 2007. The results showed that Kuder-Richardson formula (KR) 20 coefficient was 0.5 for mothers' knowledge and Cronbach's alpha coefficient was 0.7 for mothers' perception.

The questionnaire contained:

a. Socio-demographic factors of family:

1. Parents:
   - 1.1 Age of parents
   - 1.2 Marital status
   - 1.3 Education of parents
   - 1.4 Occupation of parents
   - 1.5 Economic status of parents

2 Family:
   - 2.1 Number of children in family
   - 2.2 Family size

b. Mother's knowledge about pneumonia

1 Simple signs and symptoms of pneumonia
2 Causes and factors related with pneumonia
3 Simple assessments for pneumonia
4 Pneumonia prevention

c. Mother's perception about pneumonia

1 Perceived susceptibility (mother's perception of her children risk to getting pneumonia)
2 Perceived severity (mother's perception of the seriousness of the pneumonia condition, and its potential consequences)

3 Perceived barriers (mother's assessment of the influences that facilitate or discourage adoption of the promoted behavior according pneumonia prevention and asssessment)

4 Perceived benefits (mother's assessment of the positive consequences of adopting the pneumonia assessment and prevention).

d. **Additional question for mothers of pneumonia children (in pediatric ward)**

History of getting pneumonia in their children.

3.6 Data Collection Procedure

This procedure was involved trained interviewers who were conducted interview by the questionnaires to the mothers. The interviewers were trained one day before data collection but they would not be informed about the objectives to prevent possible bias in interview process.

Using standardized questionnaire, trained interviewers obtained informed consent i.e., direct questionnaire method and then data was collected following information from the mothers.

3.7 Data Analysis

After be collected completely, the data was recoded. Standardized procedures were used for data recoding and analysis. Data was entered into computer using Epi data, and then it was processed and analyzed using Minitab and MegaStat (Microsoft Excel).

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3.7.1 Measurement of Economic Status of Parents

Based on collected data from research, it was categorized as high, medium and low income. Using mean and standard deviation it was categorized as high for the average of total income of both parents was more than mean + standard deviation, medium for the average of total income of both parents was in the range of mean $\pm$

standard deviation and low income if the average of total income of both parents was less than mean – standard deviation.

3.7.2 Measurements of Mother's Knowledge and Perception

To measure mother's knowledge and mother's perception about pneumonia disease, scales was used for valued point for scores.

For about 20 questions in measuring mother's knowledge, the score for each question was given as 1 for correct answer and 0 for not sure or wrong answer. Total score of 20 correct answers was given as 20. From the total scores those will be collected, it was used the mean and standard deviation as the cut of point to classify them become 3 categories. Those were categorized as good for total score more than mean + standard deviation, fair for total score as mean $\pm$ standard deviation and poor if the total score of each mother was less than mean – standard deviation.

To categorize mother's perception about pneumonia, for about 20 questions those were used; the score for each question was given as 3 for correct agreement/disagreement, 2 for no opinion and 1 for incorrect agreement/disagreement. Total score of 20 correct answers was given as 60. Using Best Criteria (59), total score for each respondent was calculated and was labeled based on 3 categories. It was used class interval, minimum score and maximum score as the guidance score to determine the categories. For class interval (CI) can be calculated based on formula:

$$\text{Class Interval (CI)} = \frac{\text{Maximum score} - \text{Minimum score}}{\text{Levels of categories}}$$

Those was categorized as good perception for total score more than minimum score + (2 x CI value); fair perception for total score between minimum score + CI value and minimum score + (2 x CI value); and poor perception if the total score of each mother was less than minimum score + CI value.

3.7.3 Statistical Analysis

Descriptive analysis was done by calculating frequency and percentage of each variable. All of the collected data was entered to computer and directly recoded with Epi Data 3.0. Then it was exported to and processed using Minitab and MegaStat (Microsoft Excel). For mother's knowledge and perception, the total score for each mother (respondent) was calculated based on the scoring method and it was categorized as 3 categories according to the calculated total scores and measurement method. Then it was calculated to find frequency and percentage of each category.

Chi square test was performed to determine associations between the occurrence of pneumonia and both mother's knowledge and mother's perception about pneumonia disease. Fisher exact test was used if one or more expected frequencies of each cross tabulation were found less than 5. Association was determined as significant with 95% confidence if p value < 0.05 based on statistical value $\alpha = 0.05$.

CHAPTER 4
RESULTS

The study was conducted at Nakhon Pathom General Hospital, Thailand from January 22-30, 2007. We have conducted study among 140 mothers of children under five years as respondents. They were taken purposively using quota sampling according the small amount of children under five years who attended at pediatric clinic. The data was collected by interviewing mothers, based on structured questionnaire.

For further analyzing, descriptive techniques and analytical methods were applied and the results were presented by five parts:

1. Socio-demographic factors of family.
2. Mother's knowledge about pneumonia disease.
3. Mother's perception about pneumonia disease.
4. The occurrence of pneumonia
5. Associations between the occurrence of pneumonia and both mother's knowledge and mother's perception

4.1 Socio-Demographic Factors of Family

The distribution of respondents in terms of age, education, occupation, marital status, economic status, number of children in family and family size can be seen at table 3.

Age of parents

Almost the age of parents was more than 25 years old. This was shown as mothers whose age more than 25 years old were 93 women of 140 women (66.43 %)

and only 47 women (33.57 %) had age less than 25 years old. Both with fathers' age, there were 107 of 132 people (81.06 %) as more than 25 years old and the rest were about 25 people (18.94 %) as less than 25 years old.

Marital status

According to marital status of the parents, there were 8 mothers (5.71 %) as single parents and the rest were about 132 women (94.29 %) lived together with their husbands.

Economic status of parents

For economic status of parents, this study showed wide variation of average family income of family per month. Based on the mean was 11480.00 Baht with standard deviation as 8,717.10, among 140 families, there were 13 families (9.29 %) had average income per month more than 20,197.10 Baht (high income), 123 families (87.86 %) had average income per month between 2,762.90 Bath and 20,197.10 Baht (middle income), and also there were 4 families (2.86 %) had average income per month less than 2,762.90 Bath (low income).

Education of parents

The result of this study also showed the highest education levels. Of 140 mothers, 52 women (37.14 %) were primary school graduated, 36 women (25.71 %) were high school/ vocational school graduated, 32 women (22.86 %) were junior high school graduated, 14 women (10.00 %) were college or university graduated and 6 women (4.29 %) had not taken any schools. Similar education level of their husbands, of 132 men there were 47 men (35.61 %) as primary school graduated, 36 men (27.27 %) were high school/vocational school graduated, 33 men (35.00 %) were junior high school graduated, 13 men (9.85 %) were college or university graduated and 3 men (2.27 %) had not taken any schools (Table 3).

Occupation of parents

Table 3 shows among 140 mothers, 55 women (39.29 %) worked as laborer, 52 women (37.14%) were unemployment, 17 women (12.14 %) worked in private companies, 9 women (6.43 %) worked as traders, 5 women (3.57 %) worked as government officers and 2 women were farmers. Different from their husbands, of 132 men, there were 89 men (67.42 %) working as laborer, 15 men (11.36 %) worked in private company, 14 men (10.61 %) worked as government officers, 11 men (8.33 %) were traders, and the rest were 2 men (1.52 %) as farmer and unemployment.

Number of children in family

Other socio-demographic factor that was found in this study is the number of children in family. Among 140 families there were 121 mothers (86.43 %) 2 children and less; and around 19 mothers (13.57 %) had more than 2 children.

Family size

The family size which showed the crowd of family was also found out in this study. There were 77 mothers (55%) living with 5 and more of other family members and around 63 mothers (45%) were living with less than 5 other family members (Table 3).

Table 3 Socio-demographic factors of family

Variables	Number (n)	Percentage (%)
Age of parents		
Mother		
Less than 25 years old	47	33.57
25 years old or more	93	66.43
Total	140	100.00
Father		
Less than 25 years old	25	18.94
25 years old or more	107	81.06
Total	132	100.00
Marital status		
Living together	132	94.29
Living alone	8	5.71
Economic status of parents		
Low	4	2.86
Medium	123	87.85
High	13	9.29
Total	140	100
Education of parents		
Mother		
Primary	52	37.14
Junior High School	32	22.86
High School	36	25.71
University/College	14	10
No schooling	6	4.29
Total	140	100

Table 3 Socio-demographic factors of family (cont.)

Variables	Number (n)	Percentage (%)
Education of parents		
Father		
Primary	47	35.61
Junior High School	33	25.00
High School	36	27.27
University/College	13	9.85
No schooling	3	2.27
Total	132	100.00
Occupation of parents		
Mother		
Government officer	5	3.57
Private company	17	12.14
Trader	9	6.43
Labor	55	39.29
Others/ Farmer	2	1.43
Unemployment	52	37.14
Total	140	100.00
Father		
Government officer	14	10.61
Private company	15	11.36
Trader	11	8.33
Labor	89	67.42
Others/ Farmer	2	1.52
Unemployment	1	0.76
Total	132	100.00
Number of children in family		
2 children or less	121	86.43
More than 2 children	19	13.57
Total	140	100.00
Family size		
Less than 5 family members	63	45.00
5 or more family members	77	55.00
Total	140	100.00

4.2 Mother's Knowledge about Pneumonia Disease

Mother's knowledge about pneumonia contained 4 dimensions with 5 questions for each dimension. It can be described separately as simple signs and symptoms of pneumonia, causes and factors related with pneumonia, simple assessments for pneumonia and pneumonia prevention. In each question, there was 3 answers, which were yes, no and not sure.

Around 60% of the mothers gave correct answer for positive question (answered yes) about fever, cough and fast breathing as sign of pneumonia and around 62.14% of the mothers gave correct answer about lower chest indrawing as sign of pneumonia. There were only 47.86% of the mothers gave correct answer about chest pain as sign of pneumonia, 36.43% of the mothers gave correct answer about loss appetite in sick children is sign of serious disease (pneumonia) and also 57.86% of the mothers gave correct answer about germs as the cause of pneumonia. This study found 87.86% of the mothers gave correct answer in term of exclusive breastfeeding, 96.43% in term of bringing children who has pneumonia to hospital and 95.71% in term of keeping children from smoking parent. For negative questions, around 60.71% of mothers gave correct answer (answered no) in term of family members in children's room and 75.71% in term of improper ventilation for children's room. For details, the results of mother's knowledge can be seen at Table 4.

Table 4 Distribution of answers in term of knowledge among 140 mothers

No.	Items of knowledge	Answer Yes (%)	No (%)	Not sure (%)
	Simple signs and symptoms of pneumonia			
1	Fever, cough and fast breathing are signs of pneumonia.	60.00	13.57	26.43
2	Loss of apetite is sign of serious disease	36.43	37.14	26.43
3	Lower chest indrawing is also sign of pneumonia.	62.14	12.14	25.72
4	Children with pneumonia sometimes have chest pain.	47.86	15.71	36.43
5	Abnormal breathing sound can be related with pneumonia.	72.14	11.43	16.43
	Causes and factors related with pneumonia			
6	Pneumonia is caused by germ or microorganisms	57.86	15.00	27.14
7	Immunization can prevent pneumonia.	76.43	9.29	14.28
8	Exclusive breast feeding can prevent pneumonia	87.86	7.14	5.00
9	Many family members in children's room.*	22.86	60.71	16.43
10	Kitchen inside the house without proper ventilation.	80.72	7.14	12.14
	Simple assessments for pneumonia			
11	Bring the children to hospital/health center	96.43	2.86	0.71
12	Sponge the sick child who has high fever with fresh water.	81.43	11.43	7.14
13	Oxygen for children having pneumonia.	87.14	5.71	7.15
14	Children with massive vomiting with drinking medicine.	86.42	7.86	5.72
15	Scheduled medicine for home application.	91.43	4.28	4.29

Note: * negative question

Table 4 Distribution of answers in term of knowledge among 140 mothers (cont.)

No.	Items of knowledge	Answer Yes (%)	No (%)	Not sure (%)
	Pneumonia prevention			
16	The sick child should sleep separately with other children.	87.86	7.14	5.00
17	Keeping someone's drinking glass and eating utensils separately.	85.71	8.57	5.72
18	Wash hands frequently.	93.57	2.86	3.57
19	Keeping children from smoking parent.	95.71	3.57	0.72
20	Keep the sick child in isolated room without proper ventilation.*	16.43	75.71	7.86

Note: * negative question

The total score for each mother's knowledge was counted based on correct answer of mother about pneumonia disease. The maximum score that will be gotten by the mother was 20 of 20 questions. Among 140 mothers, the minimum score that was found is 5 and the maximum score was 20. Based on the mean of this scores was 15.24 and standard deviation as 2.57, almost mothers had scores between 12.67 and 17.80 (fair knowledge) which is 92 women (66%). Around 27 women (19%) had scores more than 17.80 (good knowledge) and 21 women (15%) had scores less than 12.67 (poor knowledge). This can be seen at Table5.

Table 5 Level of knowledge of 140 mothers

Knowledge	n	%
Good	27	19
Fair	92	66
Poor	21	15

Based on correct answers of mothers in each dimension, mother's knowledge about pneumonia can be described separately as follows.

4.2.1 Simple Signs and Symptoms of Pneumonia

Figure 9 shows only a few mothers answered all the questions correctly (7%) in term of simple signs and symptoms of pneumonia and there were quite equal distribution of mothers who answered 2 – 4 questions correctly (22%, 30% and 25%). And only 7% of mothers did not give correct answers for all questions.

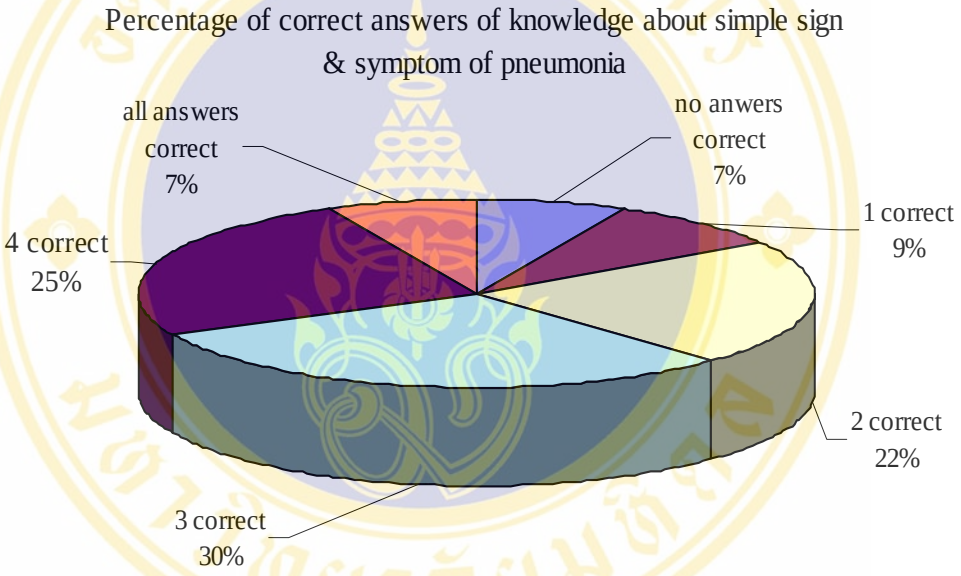

Figure 9 Distribution of knowledge about simple signs and symptoms of pneumonia

4.2.2 Causes and Factors Related with Pneumonia

Mother's knowledge about causes and factors related with pneumonia had different pattern of its distribution. Figure 10 shows around 21% of mothers answered all the questions correctly and the highest proportion was mothers who answered 4 questions correctly which was 39%. There were 25% of mothers answered 3 questions correctly, 11% of mothers answered 2 questions correctly and only 4% of mothers answered 1 question correctly.

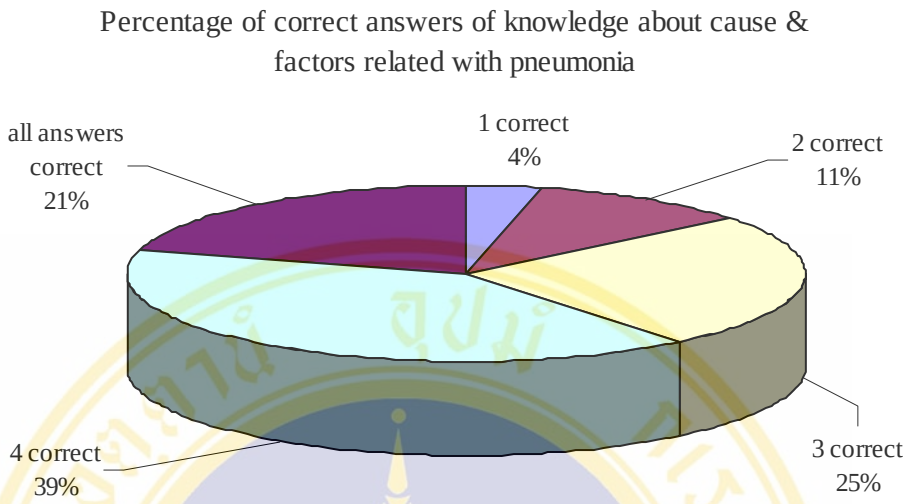

Figure 10 Distribution of knowledge about causes and factors related with pneumonia

4.2.3 Simple Assessments for Pneumonia

The third dimension of mother's knowledge that was found in this study is mother's knowledge about simple assessments of pneumonia. For this part, almost mothers answered all the questions correctly (60%). It was followed by mothers who answered 4 questions correctly (29%) and only a few mothers answered less than 4 questions correctly (1%, 3% and 7%). This result can be seen at Figure 11.

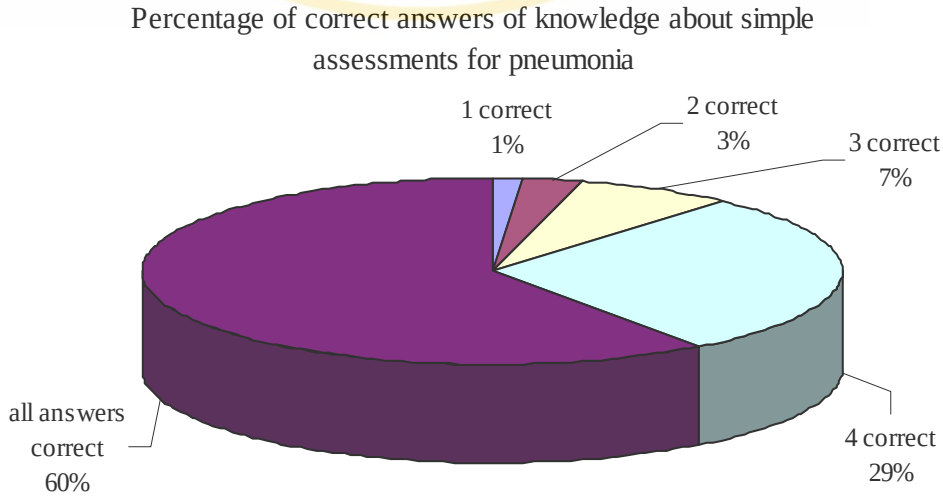

Figure 11 Distribution of knowledge about simple assessments for pneumonia

4.2.4 Pneumonia Prevention

It was quite similar to the knowledge about simple assessments for pneumonia; in mother's knowledge about pneumonia prevention, almost mothers answered all the questions correctly (58%). It was followed by mothers who answered 4 questions correctly (28%), and mothers who answered less than 4 questions correctly (9% and 5%). For detail, this result also can be seen at Figure 12.

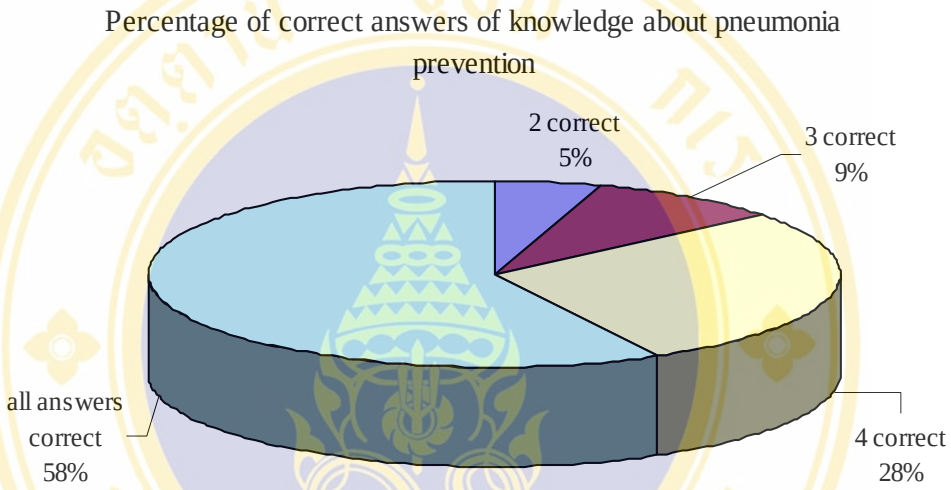

Figure 12 Distribution of knowledge about pneumonia prevention

4.3 Mother's Perception about Pneumonia Disease

In this study it was measured 4 dimensions those build mother's perception about pneumonia disease. It can be described separately as perceived susceptibility, perceived severity, perceived barriers and perceived benefits. Five statements were given to responded for each dimension, so the total statements of mother's perception were 20 statements. For each statement, there was 3 choices of opinion, which were agree, disagree and no opinion.

There was 92.86% of mothers gave correct opinion for positive statements (showed agreement) about many children in the same bedroom makes the infection spreads easily, 95.71% of mothers gave correct opinion in term of air flow ventilation and 92.86% in term of cough and fast breathing as sign of pneumonia. For negative

statements, around 94.29% of mothers gave correct opinion (showed disagreement) in term of smoking habit of family members but only 20% of mothers gave correct opinion in term of chest indrawing of crying children. But there was only 53.57% of mothers gave correct opinion about running nose and cough only as sign of serious disease including pneumonia (Table 6).

Table 6 Distribution of opinions in term of perception among 140 mothers

No.	Items of perception	Opinion		
		Agree (%)	Disagree (%)	No opinion (%)
	Perceived Susceptibility			
1	Pneumonia and immunization.	87.14	8.57	4.29
2	People with cough/cold may hug and kiss . a young baby.*	8.57	87.14	4.29
3	Chance for getting pneumonia and smoking people.*	5.71	87.86	6.43
4	Under nutrition children are easier to get pneumonia.	82.86	10.00	7.14
5	Many children in one bedroom will spreads infection.	92.86	5.00	2..14
	Perceived Barriers			
6	Severe illness of child is due to the will of spirits.*	7.86	89.29	2.85
7	Smoking habits among family member/s.*	4.29	94.29	1.42
8	Cough and cold are normal conditions.*	19.29	78.57	2.14
9	Pneumonia prevention is not necessary.*	12.14	85.71	2.15
10	Giving baby bottle-feeding with instant milk.*	24.29	69.29	6.42

Note: * negative statement

Table 6 Distribution of opinions in term of perception among 140 mothers (cont.)

No.	Items of perception	Opinion		
		Agree (%)	Disagree (%)	No opinion (%)
	Perceived Benefits			
11	Keep household and environment that surrounds it clean.	95.71	2.86	1.43
12	Giving fresh air flow regularly to children's room.	95.71	2.86	1.43
13	Hospitalized for pneumonia.	91.43	4.29	4.28
14	Complete immunization.	89.29	5.71	5.00
15	Regular weighing for children is necessary.	93.57	2.86	3.57
	Perceived Severity			
16	Cough and fast breathing is serious sign of disease.	92.86	4.29	2.85
17	Children can not drink or sucking breastmilk well.	76.43	17.86	5.71
18	Running nose and cough only is serious sign of disease.*	37.14	53.57	9.29
19	Breathing with grunting or wheezing sounds.	91.43	5.00	3.57
20	Chest indrawing when child cries is serious sign.*	66.43	20.00	13.57

Note: * negative statement

This study found the minimum score of mother's perception was 34 and the maximum score was 60. Using Best Criteria, this study found around 113 mothers (81%) had score more than 51.33 (good perception), 24 mothers (17%) had score between 42.67 and 51.33 (fair perception); and only 3 mothers (2%) had score less than 42.67 (poor perception).

Table 7 Level of perception among 140 mothers

Perception	n	%
Good	113	81
Fair	24	17
Poor	3	2

Regarding the correct opinions of mothers in each dimension, mother's perception about pneumonia can be described separately as follows.

4.3.1 Perceived Susceptibility

This study found for mother's perception of perceived susceptibility, Figure 13 shows almost mothers gave correct opinions for all statements, which was around 54%, followed by 33% of mothers who gave 4 correct opinions for all statements and only a few mothers gave less than 4 correct opinions (11%, 1% and 1%).

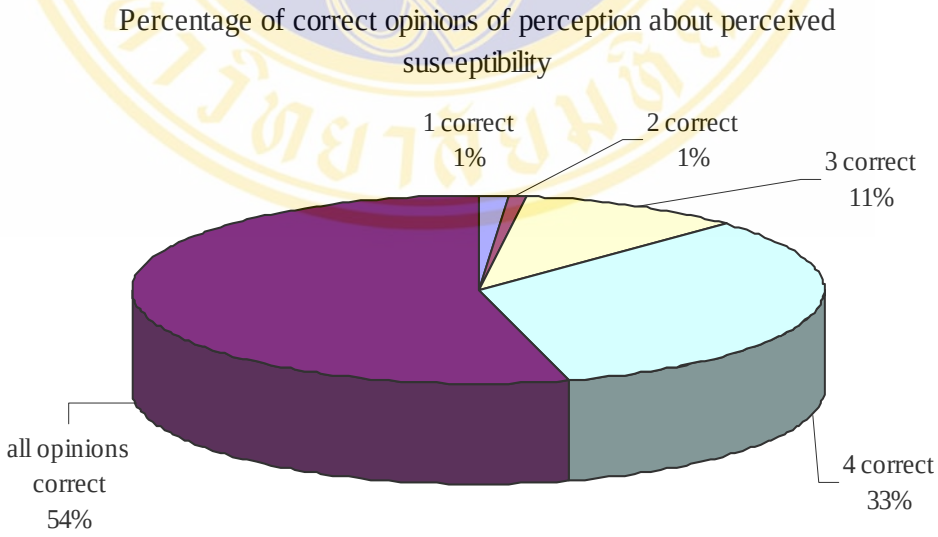

Figure 13 Distribution of perception about perceived susceptibility

4.3.2 Perceived Severity

Small number of mothers who gave correct opinions for all the statements was found in perceived severity, which was only 7 % of all the mothers. But there was quite equal distribution of mothers who gave 3 – 4 correct opinions for all the statements (40%, 39%). For detail, this result also can be seen at Figure 14.

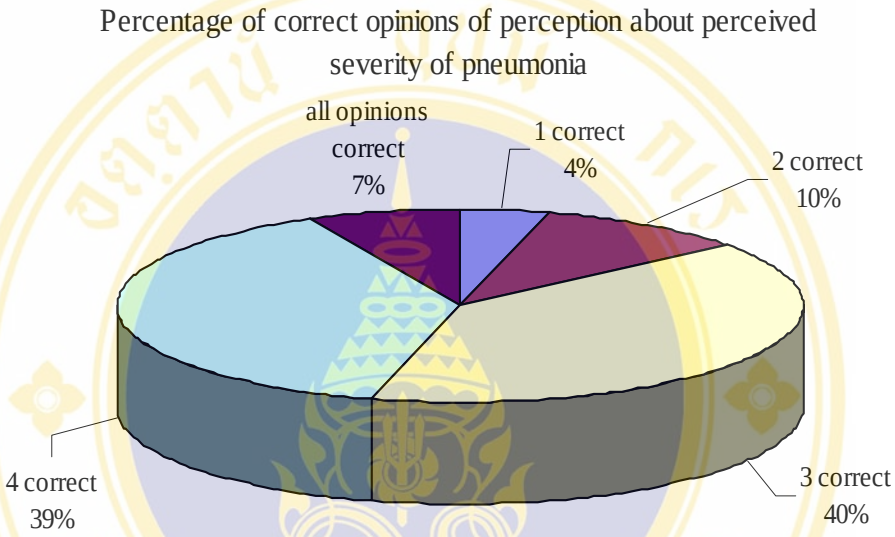

Figure 14 Distribution of perception about perceived severity

4.3.3 Perceived Barriers

It was quite similar to perceived susceptibility; in mother's perception about perceived barriers, around 50% of mothers gave correct opinions for all statements, followed by mothers who gave 4 correct opinions for all statements which was 28%. For detail, this result also can be seen at Figure 15.

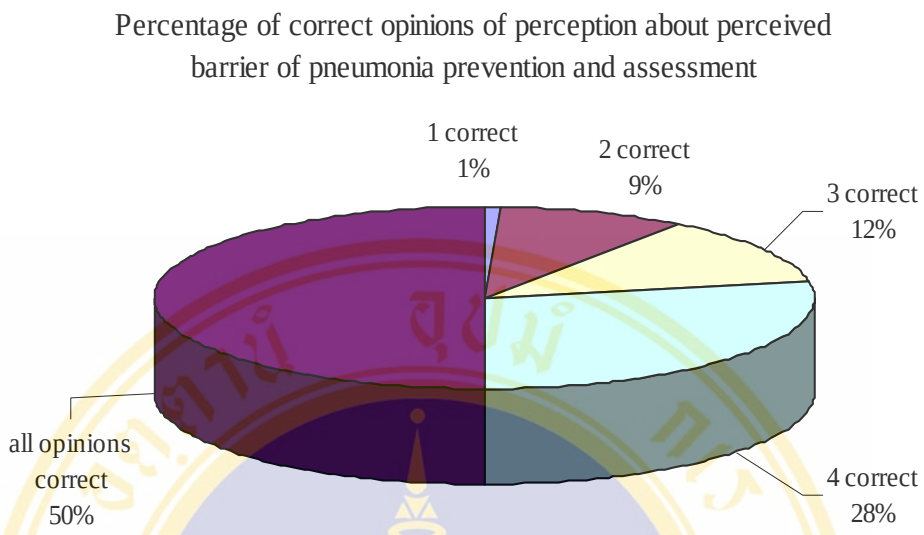

Figure 15 Distribution of perception about perceived barriers

4.3.4 Perceived Benefits

Figure 16 shows the distribution of perception about perceived benefits, it means mother's perception to assess the influences that facilitate or discourage adoption of the promoted behavior according pneumonia prevention and asssessment. Almost mothers gave correct opinion for all the statements, which was 73% of all the mothers. Around 20% of mothers gave 4 correct opinions and a few mothers gave less than 4 correct opinions for all the statements (6% and 1%).

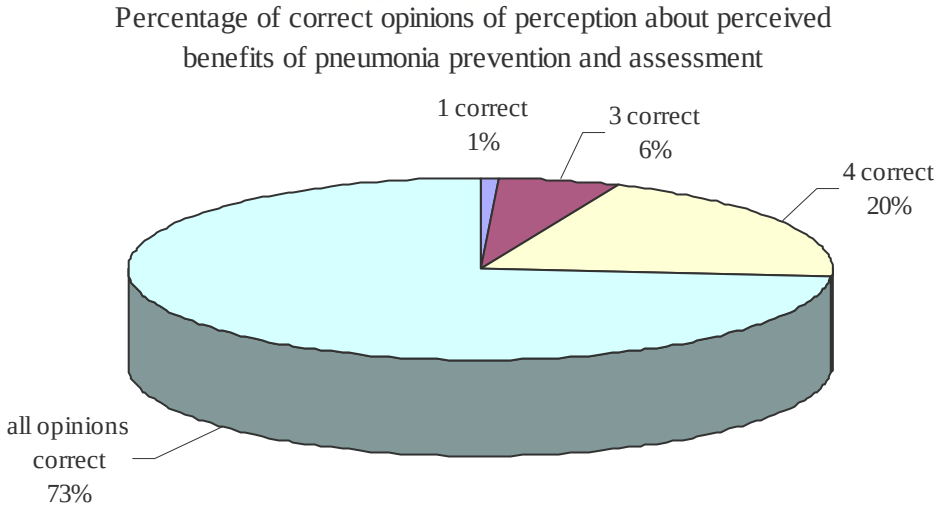

Figure 16 Distribution of perception about perceived benefits

4.4 The Occurrence of Pneumonia

This study only found 4 mothers whose children were diagnosed having pneumonia. Among 4 mothers, 2 mothers (50%) whose children had more than one episode of getting pneumonia, and 2 mothers (50%) were the first experiences of their children for getting pneumonia.

4.5 Associations between The Occurrence of Pneumonia and both Mother's Knowledge and Mother's Perception

This study also determined associations between the occurrence of pneumonia and both mother's knowledge and mother's perception.

By combining fair and good categories, mother's knowledge was modified to 2 categories. By using Fisher Exact test for analysis, this study found no significant association between the occurrence of pneumonia and mother's knowledge. (P > 0.05)

Table 8 Percentage of mothers by the occurrence of pneumonia and mother's Knowledge

	Poor	**Fair to Good**	
	n (%)	**n (%)**	**P value[f]**
Children never have pneumonia	19 (90.5)	117 (98.3)	0.10
Children have pneumonia	2 (9.5)	2 (1.7)	
Total	21 (100.0)	119 (100.0)	

Note: [f] Fisher Exact test

Mother's perception was also modified to 2 categories by combining poor and fair categories. By using Fisher Exact test for analysis, this study found no significant association between the occurrence of pneumonia and mother's perception. (P > 0.05)

Table 9 Percentage of mothers by the occurrence of pneumonia and mother's perception

	Poor to Fair n (%)	**Good** n (%)	**P value**[f]
Children never have pneumonia	27 (100.0)	109 (96.5)	0.42
Children have pneumonia	0 (0.0)	4 (3.5)	
Total	27 (100.0)	113 (100.0)	

Note: [f] Fisher Exact test

Using Fisher Exact test, this study also found there was no significant association between mother's knowledge and mother's perception. By using The Spearman Rank Correlation Coefficient this study also found no significant association between mother's knowledge and mother's perception (r_s = 0.07).

Table 10 Percentage of mothers by mother's knowledge and mother's perception

	Perception		
	Poor to Fair n (%)	**Good** n (%)	**P value**[f]
Knowledge			
Poor	6 (22.2)	15 (13.3)	0.92
Fair to Good	21 (77.8)	98 (86.7)	
Total	27 (100.0)	113 (100.0)	

Note: [f] Fisher Exact test

CHAPTER 5
DISCUSSION

The aim of this study was to describe mother's knowledge and mother's perception about pneumonia disease. But it also analyzed association between the occurrence of pneumonia and both mother's knowledge and mother's perception.

5.1 Socio-Demographic Factors in Family

This study showed almost parents who were involved in this study are more than 25 years old (66.43%). Around 94.29% of mothers lived together with their husbands and 37.14% were unemployment. Previous study in Bangkok found around 72% of mothers had age more than 25 years old, 90% of mothers lived together with their husbands and 59% of them were housewives (17). This seemed the parents of children under five were adult enough to care their children well.

For education status of parents, this study found it was predominantly primary school graduates (37.14% of mothers and 35.61% of fathers). That was quite similar to previous study in same province that showed around 64.4% of mothers (57) and also the previous study in Bangkok which was 51% of mothers (17) were primary school graduates. The second biggest proportion in those studies was high school graduates, followed by junior high school graduates. This showed almost parents had low education level.

Around 123 families (87.86%) were in middle income level according to this study's criteria. Almost parents worked as laborer (39.29% of mothers and 67.42% of fathers) then followed by parents who worked in private companies. This study found wide variation of average family income of family per month.

There was equal proportion between mothers who lived with less than five family members (45 %) and those who lived with five or more family members (55%) in their houses. Almost mothers (86.43%) had 2 children or less in this study. This was also quite similar to previous study in Bangkok which showed 58% of mothers lived with five or more family members in their houses, but only 42% of mothers had 2 children or less (17). Other study in Nakhon Pathom province also showed around 71.1% of mothers had 2 children or less (57). These results showed almost families in Thailand had small family size but lived with more than 5 family members per house.

5.2 Mother's Knowledge about Pneumonia Disease

This study found that 66% of the mothers had fair knowledge about pneumonia, 19% had good knowledge and 15% of the mothers had poor knowledge about pneumonia. It was quite similar to previous study in Nakhon Pathom province 1994. There were 60 % mothers had fair knowledge, 20.6% had good knowledge and 19.4% of mothers had poor knowledge (57). These results showed that even though mother's knowledge about acute respiratory infections, especially pneumonia, was quite stagnant for a long time but almost its level was found at high levels (the mean score was 76.2% of the maximum total score). Socialization and transfer knowledge between health personals to community seemed successful beside other pneumonia prevention programs then the knowledge about pneumonia spread widely in community. So it means almost mothers had enough knowledge about pneumonia.

Around 21% of mothers answered all the questions correctly in term of causes and factors related with pneumonia. There were only 57.86% of the mothers gave correct answers about germs as the cause of pneumonia and 60.71% of the mothers gave correct answer about the number of family members in children's room.

This study found almost mothers (60%) answered all the questions correctly in term of simple assessments for pneumonia and also around 58% of the mothers gave the correct answers for all the questions in term of pneumonia prevention.

There were only a few mothers answered 5 questions correctly in term of simple signs and symptoms of pneumonia (7%). Around 36.43% of the mothers gave correct answer about loss appetite in sick children is sign of serious disease (pneumonia) and only 47.86% of the mothers gave correct answer about chest pain as sign of pneumonia. Different from the previous study in Bangkok (17) which found almost mothers could answer correctly for all of 2 questions. The lack of knowledge among mothers about simple signs and symptoms of pneumonia was found in this study. But from this result it is showed that this study seems more specific to determined mother's knowledge about simple signs and symptoms of pneumonia by using more variation of questions.

This study found lack of knowledge among mothers about simple signs and symptoms of pneumonia, and also lack of knowledge about causes and factors related with pneumonia. Figure 17 shows almost mothers answered all the questions correctly especially in pneumonia prevention and simple assessments for pneumonia, but very less of mothers answered all the questions correctly in term of simple signs and symptoms of pneumonia; and also in term of causes and factors related with pneumonia.

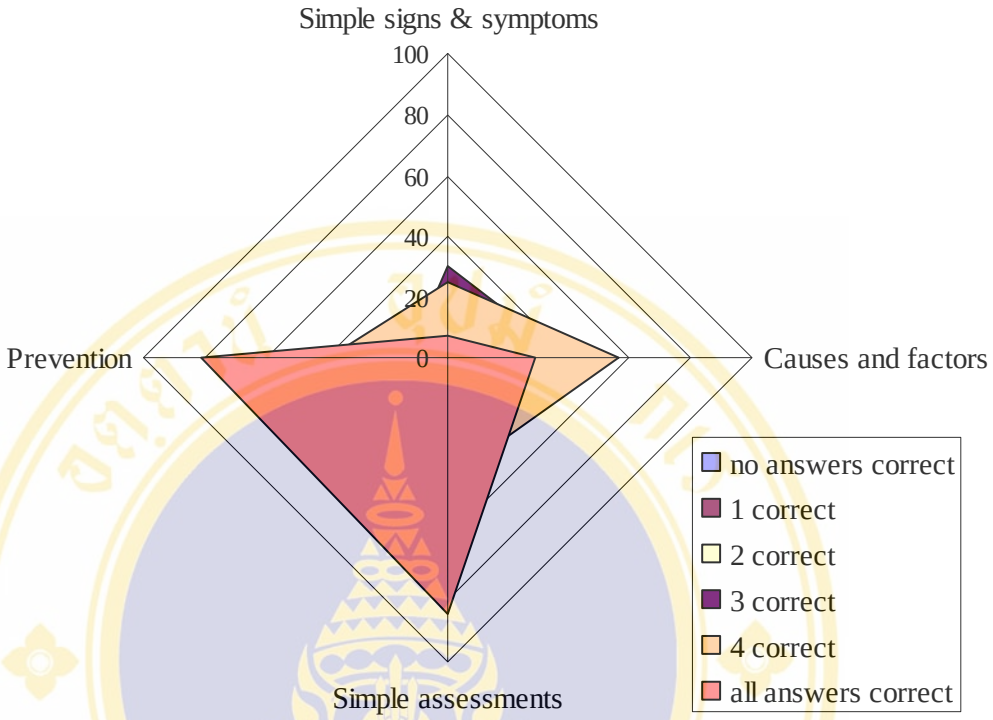

Figure 17 Distribution of correct answers of knowledge about pneumonia among 140 mothers in 4 dimensions

5.3 Mother's Perception about Pneumonia Disease

This study found around 81% of mothers had good perception, 17% had fair perception and only 2% of mothers had poor perception. It was quite different from previous study in Nakhon Pathom province 1994. There were 31.1% of mothers had good perception, 58.3% had fair perception and 10.6% of mothers had poor perception (57). These results showed that mother's perception about acute respiratory infections, especially pneumonia, has increased for more than 10 years. Almost mothers had good perception about pneumonia disease. Health policy reformation in Thailand becomes the crucial factor beside all of pneumonia prevention programs those supported the better changes of perception about pneumonia in community.

After the result of mother's perception had been analyzed separately according to each dimension, this study found 54% of mothers gave correct opinion for all statements in term of perceived susceptibility and around 50% of mothers gave correct opinions for all statements in term of perceived barriers. Almost mothers (73%) gave correct opinions for all the statements in term of perceived benefits of pneumonia prevention and assessment. But there was only a small number of mothers who gave correct opinion for all statements in term of perceived severity, which was only 7% of all the mothers. There were 20% of the mothers gave correct opinion in term of chest indrawing of crying children and 53.57% of the mothers gave correct opinion about running nose and cough only as sign of serious disease including pneumonia. Different from previous study in same province that showed there were not more than 28.3% of mothers or caretakers have good perception of perceived severity (57). The low perception of perceived severity became dominant among all the perception's dimensions those were found in this study (Figure 18).

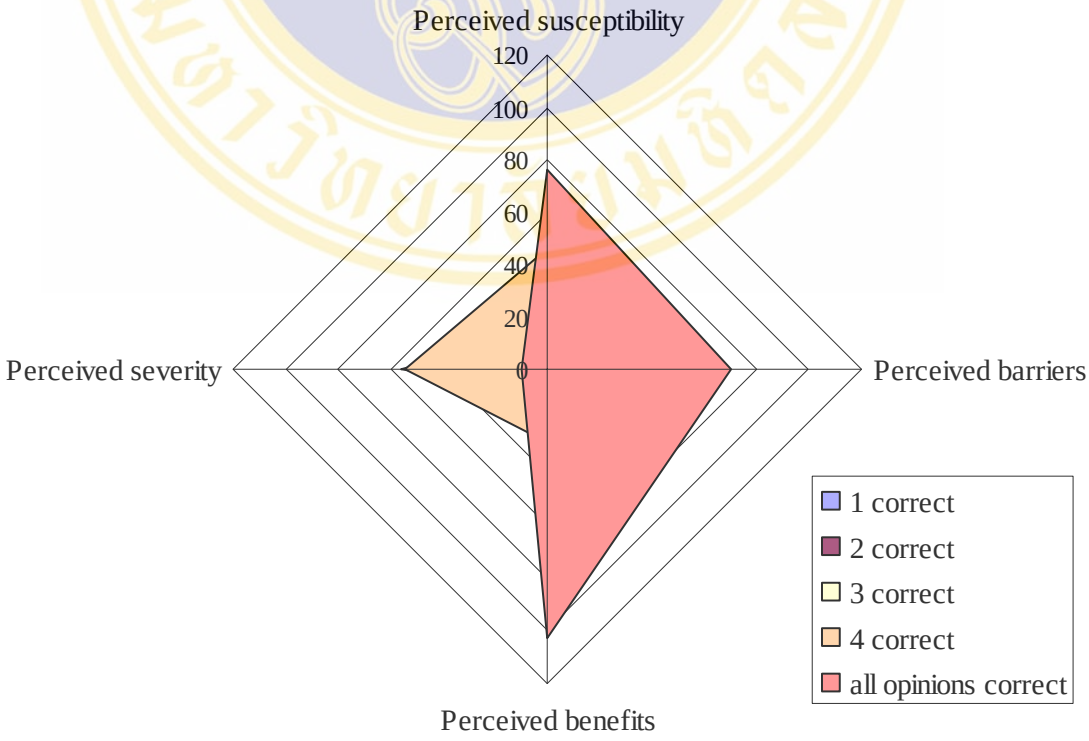

Figure 18 Distribution of correct opinions of perception about pneumonia among 140 mothers in 4 dimensions

5.4 The Occurrence of Pneumonia

This study found there were only 4 mothers whose children had been diagnosed with pneumonia. Previous study in Nakhon Pathom province in 1994 found 50 cases of lower respiratory tract infections including pneumonia among 180 children under five years (57).

Similar study in Bangkok found 50 cases of pneumonia among children under five years in 2000 (17). It was studied at national institute of child health when the children were sent from every province of Thailand.

It showed the lower occurrence of pneumonia disease among children under five years especially in Nakhon Pathom General Hospital in 2007. It was matched with the low occurrence of pneumonia in Thailand which was 1.66 per 100,000 populations in 2004 (11). The acute respiratory diseases control seemed to be successful here. The lower population below poverty line and health policy reformation in Thailand was also the crucial factor involved (12).

5.5 Associations between The Occurrence of Pneumonia and both Mother's Knowledge and Mother's Perception

This study found there were no significant associations between the occurrence of pneumonia and both mother's knowledge and mother's perception. Using Fisher Exact test, this study found p values more than 0.05 in all associations. Similar study in same province showed there was significant association between occurrence of pneumonia and mother's knowledge with p value was 0.03 (57). But other studies found there was no significant association between the occurrence of pneumonia and mother knowledge (17, 28). Previous study also found there was no significant association between the occurrence of pneumonia and mother's perception using Chi Square test with p value 0.33 (57).

There was no significant association between mother's knowledge and mother's perception by using both Fisher Exact test and The Spearman Rank Correlation Coefficient ($P > 0.05$). This means mothers who have poor knowledge of pneumonia disease will not always have poor perception of pneumonia disease and also mothers who have good knowledge of pneumonia disease will not always have good perception. But previous study in Nakhon Pathom province in 1994 found there was significant association between mother's knowledge and mother's perception by using Chi Square test with p value was less than 0.05 (57).

This study failed to establish significant associations among the occurrence of pneumonia, mother's knowledge and mother's perception due to small sample size and homogeneous in sample's characteristics. These also influenced the statistical power to establish the significance of those associations.

CHAPTER 6
CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

This study was hospital base cross sectional study. It was conducted at Nakhon Pathom General Hospital, Thailand from January 22-30, 2007. The objectives of this study were to describe socio-demographic factors of family, mother's knowledge about pneumonia, mother's perception about pneumonia and the occurrence of pneumonia. It also tried to find associations between the occurrence of pneumonia and both mother's knowledge and mother's perception about pneumonia. According to the limited amount of mothers who took their children under five years to this hospital, there were collected purposively around 140 mothers of children under five years by using quota sampling. They were interviewed using structured questionnaires that had been standardized, pre-tested and modified before data collection. Using computer software, all collected data was proceed and analyzed.

The results showed even though almost parents of children under five years had low education level, they were adult enough to care for their children well. Among 140 families represented by mothers, there was wide variation of average family income of family per month. Majority of families in this study had small family size and lived with more than 5 family members per house.

The lower occurrence of pneumonia among children under five years was found in this study. Based on it, this study found there were no significant associations between the occurrence of pneumonia and both mother's knowledge and mother's perception. No significant association was also found between mother's knowledge and mother's perception.

Most mothers had enough knowledge and also had good perception about pneumonia. Socialization and transfer knowledge between health personals to community seems to be successful beside other pneumonia prevention programs and make the knowledge about pneumonia spread widely in community. Health policy reformation in Thailand became the crucial factor beside all of pneumonia prevention programs those supported the better changes of perception about pneumonia in the community.

This study still found there were a lack of knowledge among mothers about simple signs and symptoms of pneumonia, especially in terms of loss appetite and chest pain as signs of pneumonia. The lack of knowledge about causes and factors related with pneumonia was also found in this study, especially about germs and the number of family members in children's room. Otherwise, the low perception of perceived severity became the dominant aspect of perception found by the study. There were only a few mothers who gave correct opinion about chest indrawing, running nose and cough in term of severity of pneumonia.

6.2 Recommendations

The community based public health education should be promoted to increase knowledge and perception for better assessing and preventing pneumonia and other dangerous diseases in community. The main points that must be strengthened in the community are the signs and symptoms of pneumonia, causes and factors related with pneumonia and also the perception of perceived severity of pneumonia. Training of health providers at all levels is recommended in for correct and applicable prevention and assessments of pneumonia and other dangerous diseases to ensure better transfer knowledge, better perception and better health practices in the community.

6.2.1 Recommendations for further study

Further study should prepare a larger population with enough amounts of children having pneumonia to get more reliable and meaningful results which can be

used to formulate better health policy in larger population. In depth interview also can be used to get further results of this kind of study.

It should be found the better results of association between the occurrence of pneumonia among children under five years and other factors related with it. It's better to measure the crowding of family members using indicators such as persons per square meter that was not measured in this study. Further studies of attitude and practice among mothers or caregivers are also needed.

Finally, this kind of study also can be conducted for other diseases as long as there are enough samples with enough characteristics to support it.

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APPENDIX

APPENDIX A

QUESTIONNAIRE

ID: ……

This questionnaire is for research purpose only. Please answer correctly according to the importance of this research for improving health program. Some questions are personal but necessary in order to get useful information. Your answers will not be exposed for any other purposes. Thank you.

Date of interview: …….. Name of interviewer: ……

General Information

Sample: (1) Pediatric clinic (2) Pediatric ward (pneumonia children)

Address: Village: …… Tambon: ……District: ……

City/Municipality: ……. Province: …….

Child's name: ……...

Child's sex: (1) male (2) female

Child's birthday: …… /……. /…… (DD/MM/YY)

Child's age: …… months.

Part 1: Socio-demographic factors of family

1. What is your age? ……years.

2. What is your current marital status?
   (1) Living together (2) Single parent (single/separated/divorced/widow)

3. What is your education level?
   (1) No schooling (2) Primary school (3) Junior high school
   (4) High school (5) University and above
   (6) Other, specify: …….

4. What is your occupation?
   (1) Unemployment (2) Government officer (3) Trader
   (4) Private company (5) Labor (6) Other, specify: …….

5. What is your husband's/spouse's age?..... years.

6. What is your husband's/spouse's education level?
   (1) No schooling (2) Primary school (3) Junior high school
   (4) High school (5) University and above
   (6) Other, specify: …….

7. What is your husband's/spouse's occupation?
   (1) Unemployment (2) Government officer (3) Trader
   (4) Private company (5) Labor (6) Other, specify: …….

8. How much is your average of total family income per month? ..... Baht.

9. How many children do you have? ..... children.

10. How many family member's are there in your home? ..... people.

11. (<u>For mother whose children is diagnosed as pneumonia or in the pediatric ward only</u>) How many times has your child had this kind of disease (pneumonia)? ..... times.

Part 2: Mother's knowledge about Pneumonia

Please state the correct answer according the following statements by signing (√) at the box in appropriate column.

No.	Questions	Answer		
		Yes	No	Not sure
12	Fever, cough and fast breathing are signs of pneumonia.	☐	☐	☐
13	Loss of apetite is sign of serious disease	☐	☐	☐
14	Lower chest indrawing is also sign of pneumonia.	☐	☐	☐
15	Children with pneumonia sometimes have chest pain.	☐	☐	☐
16	Grunting, wheezing, or others breathing sound can be related with pneumonia.	☐	☐	☐
17	Pneumonia is severe respiratory disease that's caused by germ or microorganisms	☐	☐	☐
18	Immunization can prevent your child from getting pneumonia.	☐	☐	☐
19	Exclusive breast feeding will increase the immune system and decreases chance of baby from getting pneumonia.	☐	☐	☐
20	Many family members in children's room doesn't increase children's chance to get pneumonia disease or other respiratory infections.	☐	☐	☐

No.	Questions	Answer		
		Yes	No	Not sure
21	Kitchen inside the house without proper ventilation can also increase risk of your children for getting respiratory infections and pneumonia.	☐	☐	☐
22	The best you can do if you find your children has pneumonia is to bring your children to hospital/health center.	☐	☐	☐
23	To sponge the sick child who has high fever with fresh water is a good and easy way to reduce the temperature.	☐	☐	☐
24	The dyspnea child having pneumonia should get oxygen therapy in hospital.	☐	☐	☐
25	Children may not able to drink or eat medicine if she/he has massive vomiting.	☐	☐	☐
26	To give the sick child medicine on schedule for as long as the doctor directs and to return back to hospital if the child's condition becomes worse is the better way to do if your child get pneumonia.	☐	☐	☐
	To prevent the children from pneumonia disease:			
27	The sick child should sleep separately with other children to prevent the spreading of infection.	☐	☐	☐
28	Keeping someone's drinking glass and eating utensils separate from those of other family members if he or she has respiratory infection.	☐	☐	☐
29	Wash hands frequently, especially after handling the sick child's utensils or dirty handkerchiefs.	☐	☐	☐
30	Keeping children from smoking parent.	☐	☐	☐
31	Keep the sick child in isolated room without open-close the window.	☐	☐	☐

Part 2: Mother's perception about Pneumonia

Please state the correct opinion according the following statements by signing (√) at the box in appropriate column.

No.	Questions	Answer		
		Agree	Disagree	No opinion
32	Children will get pneumonia easily if they didn't take appropriate immunization.	☐	☐	☐
33	People with cough/cold may hug and kiss a young baby without harm the baby with their infection.	☐	☐	☐
34	The children will not have chance for getting pneumonia even though there are people who smoking in their room.	☐	☐	☐
35	Under nutrition children are easier to get pneumonia or other severe infectious diseases than children who have better nutrition status.	☐	☐	☐
36	Too many children in one bedroom will make respiratory infection spreads easily among room members.	☐	☐	☐
37	Severe illness of child is due to the will of spirits, so the sick child should be taken to the monk or traditional healer first.	☐	☐	☐
38	Smoking habits among family member/s is very difficult to control, so it's alright if keep the sick child around them.	☐	☐	☐
39	Cough and cold are normal conditions of children, so it will not getting worse even though it has not taken good care.	☐	☐	☐
40	As well as the children are healthy or getting only mild diseases, why should we care to prevent pneumonia or other diseases?	☐	☐	☐

No.	Questions	Answer		
		Agree	Disagree	No opinion
41	Giving baby bottle-feeding with instant milk is the simple, modern and healthy way for baby and mother.	☐	☐	☐
42	Keep household and environment that surrounds it clean will prevent children from getting pneumonia.	☐	☐	☐
43	Giving fresh air flow regularly to children's room will prevent children with cough and fever from getting pneumonia.	☐	☐	☐
44	Children having pneumonia will get good care and cure well if they are sent to hospital.	☐	☐	☐
45	It's better to give children complete immunization to prevents them from pneumonia.	☐	☐	☐
46	Regular weighing for children under five is necessary to be done according to measure nutritional status of the children.	☐	☐	☐
47	Cough and fast breathing is serious sign of disease.	☐	☐	☐
48	Children can not drink or can not sucking breastmilk well is serious sign of disease.	☐	☐	☐
49	Running nose and cough only is serious sign of disease.	☐	☐	☐
50	Breathing with grunting or wheezing sounds is serious sign of disease.	☐	☐	☐
51	Chest indrawing when child cries is serious sign of disease.	☐	☐	☐

Thank you for your patience in answering these questions.

Sincerely yours,

Researcher

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