Masoli defined asthma as a chronic inflammatory disease health essay

Health & Medicine

INTRODUCTION

1. 1 BACKGROUND OF THE STUDY

Children are priceless treasure and gift from God. It is our conviction that the physical, emotional, psychological, and spiritual needs of children should be completely and competently met. Hence care of the little ones are considered to be of highest importance.

Masoli defined asthma as " a chronic inflammatory disease of the respiratory system associated with increased airway hyper-responsiveness, recurrent episodes of symptoms like wheeze, cough, breathlessness and chest tightness during night or early morning" (WHO, 2004) 59.

Asthma attacks all age groups but often starts in childhood. It is caused by a type of immune system response to inhaled allergens such as pollen, animal dander and other factors are inhalation of chemicals such as cigarette smoke or cleansing agents, taking aspirin, a chest infection, stress and cold air. (South Asia Chronic Disease Network Centre, 2004)32.

In an article, the environmental exposures during the early years of life and airway obstruction that develop during early period of life are in conjunction with genetic susceptibility. Those important factors such as birth order, maternal smoking , obstetric complication, elective caesarean section, maternal use of antibiotics and maternal diet which may influence the development of persistent asthma in childhood.(Journal of Environmental Health Perspectives, 2006)53.

Asthma prevalence increased from 7. 3% in 2001 to 8. 4% in 2010, where 25. 7 million persons had asthma. For the period 2008–2010, asthma prevalence was higher among children than adults, and among multiple-race, black, and american indian or alaska native persons than white persons (NCHS, 2012)54.

In an article the recent issue of statistics data regarding asthma deaths were recorded 17 deaths in 2009/10 for children under 15 years compared to seven deaths in 2005/06 in Australia. (Health News Article, 2012)88.

Globally asthma affects an estimated 300 million individuals worldwide. The incidence of asthma was 8-10 times higher in developed countries (eg, united states, great britain, australia, newzealand) than in the developing countries. In developed countries, the incidence is higher in low income groups in urban areas and inner cities than in other groups (WHO, 2010)78.

Annually, the WHO estimated that 15 million disability-adjusted life-years are lost and 250, 000 asthma deaths were reported worldwide. Approximately 500, 000 annual hospitalizations (34. 6% in 18 years or younger) are due to asthma. The cost of asthma is around $6. 2 billion. Each year, an estimated

1. 81 million people (47. 8% in aged 18 years or younger) require treatment in the emergency department. Among children and adolescents aged 5-17 years, asthma accounts for a loss of 10 million school days work of absence. (Children Allergy Clinic Centre, 2010)79. With the projected increase in the proportion of the world’s urban population from 45% to 59% in 2025, there is likely to be a marked increase in the number of asthmatics worldwide over the next two decades. It is estimated that there may be an additional 100 million persons with asthma by 2025 (GINA, 2004)85. According to WHO, asthma statistics in India states 57. 5% estimated total deaths 5. 1% estimated death per 100, 000 population, 277 among disability adjusted life-year per 100, 000, 6. 5% age standardised deaths per 100, 000, 268 age standardised among disability adjusted life-year per 100, 000. Overall it constitutes 0. 2% of all death and 0. 5% of national burden of disease (Smith, 2002)82. In India the total estimated burden of Asthma is an overall prevalence of 3% (30 million patients), and among adults over the age of 15, a median prevalence of 2. 4% was in younger. It presents the estimated prevalence rates from various parts of India (South Asia Chronic Disease Network Centre, 2006)83. A cross-sectional study regarding prevalence and risk factors of asthma in school going children in South India. The study stated that there was a high prevalence of asthma among school going children in Coimbatore. Parental history of asthma was a risk factor in both age groups studied. Television viewing for more than 2 hours, low birth weight and food allergy are additional risk factors for children aged 5-10 years. Poor ventilation and use of pillows made up of wool/ foam/ synthetic material are other risk factors in 11-15 years old children. Appropriate

preventive strategies may help reduce the risk of asthma. Children with low birth weight and a family history of asthma need careful evaluation and long term follow up (Nepal Journal of Epidemiology, 2012)33. An epidemiological study on overall prevalence rate of bronchial asthma among Indian children indicated that 2. 7million children are affected by asthma. The study concluded that the burden of bronchial asthma in Indian children is higher than was previously understood (Indian Journal of Community Medicine, 2009)41. A prevalence study of asthma in urban and rural children in Chennai revealed that the symptoms suggestive of asthma were present in 18% of children under 12 years of age and 5% had diagnosed asthma in both urban and rural areas. The study concluded that breathing difficulty was higher among urban children in the age group of 6 -12 years. (Indian Council for Medical Research Journal, 2002)36. An epidemiological study on atmospheric air pollution and incidence of bronchial asthma and the severity form in asthmatic centers at Vellore district. The findings of the study revealed that the air pollutants and their effects found in the affected children of 10 – 15% among the selected population (Journal of Environmental Science and Technology, 2010)49. A randomized study on trial of breathing retraining program performed in 33 patients with asthma with dysfunctional breathing. The findings showed a significant improvement of respiratory symptom and quality of life in the period of 6months. (Journal of Respiratory Medicine, 2004)51. Peak flow meter is a portable, inexpensive, hand-held device used to measure how air flows from lungs in one " fast blast". The meter measures ability to push air out of lungs. Many healthcare providers believe that people who have asthma can benefit from the use of a

peak flow meter. There is a need to adjust your daily medication for asthma; a peak flow meter can be an important part of asthma management plan (Journal of American Lung Association, 2012)90. The pulmonary function measurement appears to be an indicator of general health and literally a measure of living capacity. Pulmonary rehabilitation is effective to improve the respiratory status and reduces the episodes of asthma attacks. The buteyko therapy is one of the pulmonary rehabilatory techniques to lessen the symptoms of bronchial asthma (International Journal of nursing studies, 2009)50. In an article reports that " Smaller breaths conserve energy in the short term but contribute to respiratory muscle fatigue and hyperinflation as the work of exercise increases or is prolonged". A properly designed breathing retraining program in which patients with chronic respiratory illness learn to control their pattern of breathing under the stress of performing different modes of exercise at increasing intensity and duration may markedly decrease dyspnea and improve gas exchange. (American Journal of Medicine, 2009)102.

1. 2 NEED AND SIGNIFICANCE FOR THE STUDY

Children suffering from asthma lead to less active lifestyle. Avoidance of day to day triggers such as exercise and cold air generally imposes inappropriate restriction on life. This results in weakness of primary respiratory muscles and overuse of accessory muscles in breathing. There are also abnormal changes in lung volume. These impairment or abnormal changes are associated with decrease tolerance to exercise , frequent episodes of dyspnoea, decreased walking speed and distance and eventually inability to perform activities of daily living at home or in workplace or to remain active

participant in the community. The economic burden and death rate due to asthma was increase in size to the day-to-day effects of the disease. Asthma tends to occur in epidemics and affects young people nowadays. The costs of asthma to society was increase could be reduced through concentrated international and national actionMany studies have been conducted related to prevalence of asthma but few studies have tried to examine the efficacy of breathing exercise in a single study. Breathing exercise is a effective management to control asthma, therefore breathing exercise could implement to show it effectiveness in the asthmatic children who got admitted in the hospital. It also explored physiological capacities of lung in the hospitalised child. Cooperative research centre (2008)83 states that demonstration of breathing exercises designed to help reduce the use of asthma inhalers today, is a new training available to the general public. Agency of Heath Care Research Centre (2012)92 conducted a randomised controlled study of effectiveness of breathing exercises and retraining techniques in the treatment of asthma in US. In research group trained a Buteyko breathing technique for a period of 4 weeks. The result showed that there was a improvement in lung function and decrease of asthmatic symptoms significantly. Nan Fang Yi Ke Da Xue Xue Bao (2011)30 conducted a Cross-sectional study among 619 asthmatic children with disease remission aged 3 to 13 years. The children were divided into 3 age groups, namely 3 to 5 years group (314 cases), 6 to 9 years group (207 cases) and10 to 13years group (98 cases), and their respiratory physiological parameters such as FEV1 and PEF were measured. In asthmatic children, FEV1 and PEF are positively correlated to the parameters of small airway function with only

the exception of MEF25 in female children aged 3 to 5 years, suggesting the value of FEV1 in the diagnosis of asthma in children. Tarun Saxena and Saxena (2009)76 studied the effect of various breathing exercises in patients with bronchial asthma of mild to moderate severity . The sample size was 50 they were trained to perform omkara yoga at high pitch which prolonged exhalation for 12 weeks. The result showed that significant improvement in symptoms, FEV1 (force expiratory volume) and PEFR(peak expiratory flow rate) . The study concluded that breathing exercise especially expiratory exercises have improved lung function and recommended that it should be a regular part of therapy. Dr. Buteyko(2009)103 conducted a clinical trial study to show the effectiveness of Buteyko breathing technique among asthmatics who were utilizing the program of this training able to achieve a 90% reduction in bronchodilator or reliever medication and a 50% reduction in steroid medication. The open trial on 52 children was conducted over three months in a Moscow Children’s Hospital. All children responded well to some degree with self reported improvements in asthma, rhinitis and nasal mucus. Children learned this breathing technique to control their own symptoms of asthma. After intervention, 73% were able to discontinue all medication and 15% were able to reduce medication. Hu Li Za Zhi. (2009)49 conducted a quasi experimental study in which 31 voluntary children(exercise group 16; control group15). Research found a positive significant association between exercise after school and muscular strength endurance among asthmatic children. Compared to the control group, the exercise group showed favourable outcomes in terms of flexibility and muscular endurance. The study data showed favourable outcomes remained evident even after

adjusting for age, duration of disease and steroid use, values for which were unequally distributed between the two groups at baseline. Balachandran A, et al (2006)35 conducted a true experimental study on chest physiotherapy in which breathing technique was one component which considered as a separate and specialised treatment modality in routine pediatric practice for managing respiratory ailments in kanchi kamokoti child trust hospital, Chennai. The sample size was 40, 20 were in control group and 20 were in experimental group. The study data found regular practice or training of the subject shown significant improvement in pulmonary function at p <0. 05 level. The investigator personally witnessed during the clinical posting that young children are mostly suffering from symptoms such as breathing difficulty and wheezing who got admitted in hospital and had history of asthma. There was no supportive management to reduce the symptoms of asthma other than bronchodilators. Nurses can practice the breathing technique at bed side in the morning and evening along with hospital routine to reduce the severity of asthmatic symptoms to children. Hence the nurse investigator wanted to see the efficacy of breathing technique such as humming, diaphragmatic, butekyo and lip breathing technique in the reduction of asthma severity among asthmatic children. This breathing technique is cost effective, creates interest and reduces the duration of hospital stay which will enable the nurse to maintain good interpersonal relationship with the child. This forms as advantage for the nurse to gain more cooperation from the child.

1. 3 STATEMENT OF THE PROBLEM:

A quasi experimental study to assess the effectiveness of breathing techniques on pulmonary function among asthmatic children in selected setting, Vellore district.

1. 4 OBJECTIVES

To assess the pre test and post level of pulmonary function among asthmatic children in experimental and control group. To compare the pre and post test level of pulmonary function among asthmatic children within and between experimental and control group. To associate the mean differed pulmonary function score among asthmatic children with selected demographic variables of the experimental and control group.

1. 5 OPERATIONAL DEFINITION

1. 5. 1 Effectiveness

It refers to the outcome of breathing technique on pulmonary function among asthmatic children which was assessed by using modified asthma severity score given by American medical association of asthma.

1. 5. 2 Breathing Technique

It refers to the exercises given to asthmatic children to enhance the pulmonary function, which includes

BREATHING TECHNIQUE

DURATION

FREQUENCY

1. Humming breathing:

A breathing exercise that involve a short inhalation and long exhalation while making a humming sound which enhance exhalation completely5 – 10 min2 - 3 times

2. Diaphragmatic breathing:

It includes slow deep inspiration then hold for few seconds (2-3) and exhaled completely, while placing the child’s palm over the chest and abdomen. 5 – 10 min5 – 6 times

3. Buteyko breathing technique:

It is a set of simple breathing exercise which includes, Step 1 : Take normal breath in & breath out and hold for 3- 5 sec then breath out. Step 2 : Breath using nose for five minutes and take two normal breath in & breath out hold for 3-5 seconds then breath out through nose. 5 - 10 min1 – 2 times

4. Whistle blow by lips:

It includes slow inspiration and fast expiration through lips which produce sound. 3 – 5 min5 – 8 times

1. 5. 3 Pulmonary Function

It refers to the outcome of the breathing technique on the parameters like respiratory rate, heart rate, peak flow reading assessed using peak flow meter.

1. 5. 4 Asthmatic Children

It refers to individual in the age group of 6-12years who had asthma more than three months and got admitted at Government General Hospital.

1. 6 ASSUMPTION

Children with asthma may have breathing difficulties. Breathing techniques may improve pulmonary function among asthma children.

1. 7 NULL HYPOTHESES

NH1: There is no significant difference in the pre & post test level of pulmonary function among asthmatic children within and between experimental and control group. NH2: There is no significant association between the mean differed pulmonary function score among asthmatic children with selected demographic variables of the experimental and control group.

1. 8 DELIMITATION

The study was delimited to a period of 4 weeks.

1. 9 CONCEPTUAL FRAMEWORK

A conceptual framework or a model is made up of concepts, which are the mental images of the phenomena. A conceptual framework provides the guidelines to attain the objectives of the study based on the theory. It is the schematic representation of activities, steps and action of the study. A conceptual framework is used in research to outline the possible course of action to present a preferred approach to an idea or thought. In view of explaining and relating various concept of the study regarding breathing

technique, the investigator has adopted Hildegard Peplau’s interpersonal model to conceptualize the research study. Hildegard Peplau’s a nurse theorist developed the first conceptual curriculum for the bachelor of science in nursing program and proposed interpersonal theory, which describes the interpersonal process and therapeutic relationship as the ways to attain goal. For this the nurse plays various roles such as teacher, resource person, counsellor, leader and a technical expert. In this study, the investigator act as a teacher, counsellor, technical expert in breathing techniques. The breathing technique helps in improvement of pulmonary function among asthmatic children thereby control the severity of it. To achieve this goal, the investigator maintains interpersonal process and established mutual relationship. The four phases in Peplau’s interpersonal model are: Orientation phaseIdentification phaseExploitation phaseResolution phase

1. 9. 1 ORIENTATION PHASE

According to the theorist orientation phase is the problem defining phase it starts when client meets nurse as a stranger , client seeks help, express needs, inquires, shares perception and expectation of past experiences and nurse responds, explains roles to client, helps the client to identify problem and to use available resources and services.

In this study during this phase, the children has ‘ felt need’ and seeks professional assistance, the investigator helps the children to recognize and understands his /her problem and determine his /her need for help. In this study nurse investigator help the children to recognize and understand his /her problem by collecting the demographic variables and assess their

severity using modified asthma severity pulmonary index score given by American Medical association.

1. 9. 2 IDENTIFICATION PHASE

According to Peplau's theory in identification phase, the client begins to identify the problems to be worked on within relationship and select the appropriate professional assistance. The nurse helps the client to recognize his/her own interdependent participant role and promote responsibility for self. In the study the Investigator and children collaboratively sets the goal to improve the level of pulmonary function.

In experimental group

Breathing technique such as humming breathing, diaphragmatic breathing, buteyko breathing technique and whistle blow by lips was practiced at 8. 00am to 4. 00pm thrice a day with duration of 30-40 minutes, preferably half an hour before meals and continued for 3 days along with pharmacological therapy.

In control group

Follow only the hospital management without breathing technique.

1. 9. 3 EXPLOITATION PHASE

According to this theory, exploitation phase deals with achieving the desired goal. Advantage of services provided by the nurse are used is based on the needs and interest of the clients. Nurse must be know about the different phases of communication and the help the client in exploiting all avenues of help and progress is made towards completion of final step. In this study

during this exploitation phase, children attempt to drive full value which is offered by the investigator through the interpersonal relationship thereby help the children to solve their problem. In study group, the investigator demonstrates the breathing technique and encourages the child to perform the breathing techniques such as humming breathing, diaphragmatic breathing, buteyko breathing technique and whistle blow by lips. This was done at 8. 00 am to 4. 00 pm with the duration of 30 – 40 minutes, preferably half an hour before meals for 3 - 4 times a day for consecutive 3 days.

1. 9. 4 RESOLUTION PHASE

Peplau's theory states that resolution phase is the termination of professional relationship. The needs of the client have already been met by the collaborative effect of client and nurse. In this study after child needs have been met by collaborative effort of the investigator and the child, the therapeutic relationship ends. Investigator evaluates the level of pulmonary function by modified asthma severity pulmonary index score. Significant improvement in the level of pulmonary function is considered as positive outcome and the children are encouraged to follow the breathing technique. Reassessment of level of pulmonary function is performed for those with no improvement in pulmonary function and encouraged to follow the breathing technique.

1. 10 OUTLINE OF THE REPORT

CHAPTER 1 : Dealt with the back ground of the study, need for the study, statement of the problem, objectives, operational definitions, null

hypotheses, assumptions, delimitations and conceptual frame work.

CHAPTER 2 : Focuses on review of literature related to the present study.

CHAPTER 3 : Enumerates the methodology of the study. CHAPTER 4 : Presents the data analysis and data interpretation. CHAPTER 5 : Deals with the discussion of the studyCHAPTER 6 : Gives the summary, conclusion, implications, recommendations and limitations of the study. The study report ends with selected Bibliography and Appendices.