

**EFFECTIVENESS OF STRELNIKOVA BREATHING  
EXERCISES ON RESPIRATORY SIGNS AND  
PARAMETERS AMONG CHILDREN WITH LOWER  
RESPIRATORY TRACT INFECTIONS (LRTI) IN  
MASONIC HOSPITAL COIMBATORE**

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**A DISSERTATION SUBMITTED TO THE  
TAMILNADU DR. M.G.R. MEDICAL UNIVERSITY,  
CHENNAI IN PARTIAL FULFILLMENT OF THE  
REQUIREMENT FOR THE DEGREE OF  
MASTER OF SCIENCE IN NURSING  
(2010 – 2012)**

## **CHAPTER – I**

### **INTRODUCTION**

*“When I am having an breathing difficulty I feel like a fish in the pond without water”*

**JESSIE.P.**

#### **BACKGROUND OF THE STUDY**

Children as the “nation’s supremely important asset” to its family and society Children are the gift, which has much potential with one, which can be best resources for the nation if developed and utilized well.

**Park .K., (2001)**

Illness leads not only to physical impairment and functional limitation but also psychological stress resulting in tension and anxiety. Illness of the child also engulfs the whole family in a vicious cycle of apprehension, anxiety, helplessness and disturbed lifestyle.

**Gupta.P., (2004)**

Respiratory system is a frequent site of illness in children, Respiratory infections and allergies together are responsible for many disruptions in family life and missed from school work. Children respond differently to respiratory illness than do adults, the respiratory changes during childhood as new lung tissue continues to form and existing structure change in shape and function .However, most respiratory conditions are more stressful for the children than the adult, more often leading to airway obstruction or respiratory failure. In respiratory tract, lower respiratory tract infection is one of the leading common disease occur during childhood.

**Basavanthappa.B.T., (2005)**

Respiratory tract infections are responsible for death of 4.5 million children in the world each year, mainly from the developing countries. Respiratory infection occurs more frequently than any other illness.

**Gupta.P., (2004)**

The lower respiratory tract consists of the lower trachea, main stem bronchi, segmental bronchi, subsegmental bronchioles, terminal bronchioles and alveoli. The reactive portion of lower respiratory tract includes the bronchi and bronchioles in children. Cartilaginous support of the large airways is not fully developed until adolescence. Consequently, the smooth muscle in the structures represents major factor in the constriction of airway, particularly in the bronchioles, that extends from the bronchi to the alveoli.

**Wong's., (2009)**

Acute infections of the lower respiratory tract may be diagnosed in children of all ages; they tend to occur most frequently in young children who have not yet developed resistance to infectious disease. The infections that occur during the childhood include asthma, bronchitis and pneumonia.

**Marlow., (2001)**

Infection and inflammation of the lungs is particularly troublesome and is seen in many different forms in children. Other illnesses that occur in the lower respiratory tract, such as wheezing associated lower respiratory infections, asthma and pneumonia.

**Adele.P., (2005)**

Asthma is a reversible, episodic, obstructive airway disease caused by hyperactivity of the bronchial tree to a variety of stimuli. The onset of asthma usually occurs during the first five years of life. Boys are affected twice as often as girls until adolescence, when the incidence is approximately equal. Asthma is characterized by episodic bronchospasm and airway obstruction that results in dyspnoea, wheezing and excessive coughing.

**Marlow., (2001)**

Pneumonia, inflammation of the pulmonary parenchyma, is a common in childhood but occur more frequently in infancy and early childhood. Clinically, pneumonia may occur either as a primary disease or as a complication of another illness.

**Wong's., (2009)**

Children with Lower respiratory tract infections may be very anxious and may feel uncomfortable. They have increased chance of allergic reaction, not able to do normal activities, require frequent hospitalization, and interfere with family life and school attendance. There is considerable strain on the health budget and there are a number of acute and chronic infections that can affect the lower respiratory tract. In lower respiratory tract infection, Pneumonia is dangerous type of lung infection with a mortality rate of around 25% and possible complications are emphysema or lung abscess.

**Robert.B.et al., (2004)**

Antibiotic treatment is used for lower respiratory tract infections (LRTI). Penicillin, such as amoxicillin in a child-friendly formulation, should be used first-line, unless there is reason to suspect a penicillin-insensitive organism (particularly pneumococcal disease). Recent research indicates that children with non-severe pneumonia on amoxicillin for 3 days do as well as those who receive it for 5 days. If a child is genuinely allergic to penicillin, consider using a cephalosporin, quinolone, depending on any local antibiotic prescription guidelines, patterns of resistance and suspected organism. Vancomycin may be added to treatment of toxic-looking children when there is a high rate of penicillin resistance. Acyclovir is used for herpes virus pneumonia.

**Duke.T., (2005)**

Several educational programmes have been developed for children with lower respiratory tract infection, in order to promote changes in behaviour and to improve health and quality of life. Such programmes are commonly termed "self-care management" programmes. Self-management programme were intended to develop the concept of "partnership" between physician, health teams, child and family, and to teach children the skills necessary to manage lower respiratory tract infection such as asthma and other airway disease at home. As a result of participation in these programmes, children experienced a reduction of emergency room and unscheduled physician visits, and an

improvement in their physical and social activities. The need to assess the long-term persistence of self-care management skills

**Boner. A.L., (1994)**

Education of parents and child is an important aspect of lower respiratory tract infection treatment. Parents should also be asked to maintain a record of daily symptoms such as cough, wheeze and breathlessness, sleep disturbance, absence from school due to illness and medication required to keep the child symptom free is advised.

**Ghai.O.P., (2004)**

Breathing exercises helps to strengthen the child's lungs and control their breathing. Following various breathing exercises, helps to reduce the severity of respiratory signs and symptoms.

**Rupali .G., (2009)**

Learn deep breathing - Correct deep breathing regularly. Learn the correct techniques. Practicing breathing exercise permits to strengthen lungs, digestive system and circulatory system.

**Asthma day., (2008)**

A physical exercise causes problems with breathing difficulty; on the other hand, absence of exercise aggravates symptoms and respiratory infections. Solution of this paradox - exercise that specifically develops muscles and blood vessels, applying stress on the lungs during breath in and using increased air resistance due to strictly nasal fast breath in or "sniff". Clinical trials show that regular practicing of exercise, reduce frequency of attack and can completely eliminate chronic infection caused asthma. It also benefits by strengthening breathing apparatus as well as through keeping the nose clean and developing strong habit of nasal breathing that reduces exposure to allergens. Exercise is very easy to learn, and is therefore specifically helpful for children.

**Alexandra.S., (2005)**

Paediatric nurses are in a position to identify the knowledge, attitude and practice of LRTI in children. This will enable the nurse to plan with specialized

service to help the children to understand about breathing exercises that will make a significant difference in the reduction of respiratory signs and improvement in lung function.

### **NEED FOR THE STUDY**

In worldwide, Lower respiratory tract infections among children place a considerable strain and serious on the health budget. In 2002 lower respiratory tract infection was still the leading cause of deaths among all infectious diseases, and they accounted for 3.9 million deaths worldwide.

**Egore.R., (2008)**

In worldwide, the incidence of clinical pneumonia in children aged less than 10 years in developing countries is close to 0.29 episodes per child/year. This equates to 151.8 million new cases every year, 13.1 million or 8.7% which are severe enough to require hospitalization.

**WHO., (2007)**

In worldwide, the overall crude asthma incidence in children is 8.2%.Latino/Hispanics had the highest crude asthma incidence of 14.0% compared to 6% of African Americans, 6.7% for Caucasians and 6.8% for other race.

**Jamson.S., (2002)**

In United States, the most common chronic illnesses of asthma affect an estimated 10 to 12 percent of all children. The rising rate of asthma worldwide is because of environmental factors.

**HEALTH TREE., (2010)**

In Canada, in comparison, the rates of hospital admission for lower respiratory tract infections (LRTIs) (bronchiolitis and pneumonia) were notably higher at 116.1/1000 live births versus 63.2/1000 live births compared with the general United States population

In Southeast Asia, it was estimated that acute respiratory infections caused 4 million child deaths each year – 2.6 million in infants (0–1 years) and 1.4 million in children aged 1–4years. There are 450 million cases of

pneumonia each year and that it causes 3.9 million deaths. In the sub-Saharan region of Africa, 1 022 000 die and 702 000 die in south Asia.

**Sona chawdry., (2008)**

In Australia, Asthma was more prevalent among children and young adults aged 0-19 years (14%). Asthma is the most commonly reported long-term condition for children aged 0-14 years (13%). Boys (15%) were more likely to have asthma than girls (12%)

**Snapshot.A., (2001)**

In North Sweden 1.7% children were diagnosed to have asthma within two years. Allergy was the most important risk factor for increasing incidence of asthma in children.

**Ronmark.E., (1996)**

In Thailand, The incidence of pneumonia ranged from 199 to 256 per 100,000 persons per year; 151 (3.0%) patients died. The annual average pneumonia mortality rate was 6.9 per 100,000 persons (range 6.2 to 7.8 per 100,000) and was highest in persons aged < 1 year to 12 years.

**Prabasiri., (2004)**

More than half of the world's annual new pneumonia cases are concentrated in just five countries where 44% of the world's children aged less than 5 years live: India (43 million), China (21 million) and Pakistan (10 million) and in Bangladesh, Indonesia and Nigeria (6 million each).

**Varma.I.C., (2005)**

In India the current prevalence of asthma was found to be 2.6%.It was found to be 0.2% among children below 9 years in the year 1966. In the recent year the current prevalence was found to be 11.9% of the school children under the age group of 5 to 15 years. The higher prevalence in India is due to allergen and urban environmental pollution.

**Daljit.S., (2002)**

In India, Acute respiratory infection is also a serious problem accounting for 14.3 per cent deaths during infancy and 15.9 per cent deaths among children aged between 1-10 years in 2007 and All India Institute of Medical Sciences says that, lung infection-Pneumonia is curable; it kills 1.6 million children, including 1.4 lakh Indian kids, every year.

**Kabra.S.K., (2010)**

In Alaska and Southwest Indian Health Service regions there is increased rate of Lower respiratory tract infection associated hospitalization. The rate was significantly higher from 63.2 to 116.1 among 1000 children in the year of 1999-2001.

**Paediatric child health., (2007)**

In India, every 7 seconds one child under 8 years of age dies because of lower respiratory tract infection (usually pneumonia). Each year about four and half million children dies of this, ie; 30% of all deaths in childhood.

**Stephen.B., (2007)**

In Simla, there is limited data on asthma prevalence among school children aged 6-13 years. Over all prevalence of asthma in the study was found to be 2.3 percent. Boys had a higher prevalence (3.1%) than girls (1.4%).

**Behl.R.K., (2010)**

In Chandigarh, 3.6 % children affected by asthma in the age group 6-7 years and 2.5% under the age group 13-14 years, the total prevalence was found to be 3%.

**Sharma.S.K., (2004)**

In Andhra Pradesh, It was found that 19% of children under age 8, suffered from LRTI. Point prevalence of LRTI in AP was lower compared to Kerala, Madhya Pradesh and Orissa. Other neighbouring states like Tamil Nadu, Karnataka and Maharashtra had lower point prevalence of LRTI.

**Samatha.R., (2003)**



In Tamil Nadu, the overall prevalence of asthma in urban and rural children was 18% and the prevalence of diagnosed asthma was 5%. Overall 22% of urban and 9 % of rural children in the age of 6-12 years reported breathing difficulty.

**Chakravarthy.S.et.al., (2002)**

In Chennai, the incidence of respiratory illness has been increasing several folds in the past few years. Between March 2010 and March 2011, there saw a two-fold increase in the number of children with pneumonia. In the last one year, 296 children were detected with pneumonia in one city hospital of Chennai and minimum three-five cases admitted every week in one hospital.

**Karthikeyan.H.et.al., (2011)**

In our country ignorance, superstitions and social stigma associated with LRTI and its management can only be countered by constant discussions encouragement and consistent educational programmes. Due to misconceptions and erroneous assumption of facts parents are not readily accepting the new measures and it will leads to addiction. Due to the ignorance and negligence of the parents, most of the children were not diagnosed in the earliest period and to save the life from an acute attack.

General awareness of asthma is poor. Patient education programme should augment awareness, eliminate social stigma and misconceptions in the society regarding asthma Knowledge about the prevailing perception in the community would be the first step in achieving this.

**Shivabalan.S.et.al., (2002)**

The children who frequently visited the emergency department and had multiple hospital admissions, has reduced because of an education programme.

**Mayo.et.al., (2000)**

National asthma control programme was launched in 1999 to help the millions of people with asthma to gain control over their disease. The

programme goals include reducing the number of deaths, hospitalization and emergency department visit. NACP funds states, cities, school programmes to improve surveillance of asthma, train health professionals, educate individuals with asthma and explain asthma to public.

**U.S.A.Article., (2010)**

In India, Acute respiratory disease control programme is the standard case management of acute respiratory infection (ARI) and prevention of deaths due to pneumonia is now an integral part of RCH programme. Peripheral health workers are being trained to recognise and treat pneumonia. Cotrimoxazole is being supplied to the health workers through the child survival and safe motherhood programme drug kit.

**Park.K., (2009)**

**World Health Organization** recognizes asthma as a major health problem. Parent's perception of the child's disease is a significant factor influencing the acceptance of the disease and compliance to the therapy. Therefore patient education programme forms an integral component in the long term management of asthma. Knowledge empowers patients, especially in a chronic disease like asthma.

**Donna Mc Cann., (2002)** conducted a study on the prevalence and management of asthma in primary aged school children, at Pune. 25 of the schools were surveyed, an International Study of Asthma and Allergies in Childhood (ISAAC) questionnaire was distributed to parents of children in 7–9 years. Parental reports indicated a current or previous diagnosis of asthma in 24.3% children, with 17.8% receiving asthma treatment and 18.9% reporting wheeze in the previous 12 months. Of six wheezing children per Year 3/4 class, one was receiving no treatment for asthma; three had experienced four or more attacks of wheeze in the previous year with one wheezing child per two Year 3/4 classes experiencing more than 12 such attacks.

**Multani.N.K., (2010)** conducted a study to compare the effect of breathing exercises and aerobic exercises in asthmatic children in Punjab. 20 samples were selected for each group and exercises were given for a period of 6 weeks. The tool used for this study was spirometry. In aerobic exercises the calculated 't' value is 2.09 (table value -1.729) and in breathing exercises the calculated 't' value is 3.64 (table value -1.729). The study indicates that the improvement in the reduction of lung obstruction was better in breathing exercises than the aerobic exercises.

During clinical postings, the investigator has seen children diagnosed and hospitalized frequently with lower respiratory tract infections and found to continuous cough, vomiting, not taking food properly, increased school absentism and they were not having interest in activities. Family members were also looked worried. So the investigator wanted to help the children and family by improving the health status of children with some interventions. So the investigator intended to do a study on Strelnikova breathing exercises among children with lower respiratory tract infections.

### **STATEMENT OF THE PROBLEM**

A study to assess the effectiveness of strelnikova breathing exercises on respiratory signs and parameters among children with Lower respiratory tract infections (LRTI) in Masonic Hospital, Coimbatore.

### **OBJECTIVES**

1. To assess the pre test and post test score of respiratory signs and parameters among children with Lower respiratory tract infections in experimental group
2. To assess the pre test and post test score of respiratory signs and parameters among children with Lower respiratory tract infections in control group

3. To compare the pre test and post test score of respiratory signs among children with Lower respiratory tract infections in experimental group
4. To compare the pre test and post test score of respiratory parameters among children with Lower respiratory tract infections in experimental group
5. To compare the pre test and post test score of respiratory signs among children with Lower respiratory tract infections in control group
6. To compare the pre test and post test score of respiratory parameters among children with Lower respiratory tract infections in control group
7. To compare the post test score of respiratory signs among children with Lower respiratory tract infections between experimental group and control group
8. To compare the post test score of respiratory parameters among children with Lower respiratory tract infections between experimental group and control group
9. To find the association between post test score of respiratory signs of children with Lower respiratory tract infections with their selected demographic variables in experimental group.

## **OPERATIONAL DEFINITION**

### **EFFECTIVENESS**

Effectiveness means ‘doing the right thing’ and producing an intended result

**Kinderley., (2007)**

In this study, it refers to determining the extent to which the breathing exercise has brought the significant difference in reducing the respiratory signs

and improvement in lung functions among children with lower respiratory tract infection by using statistical measurements.

### **STRELNIKOVA BREATHING EXERCISES**

**Strelnikova Breathing Exercises** is a paradox - exercise that specifically develops muscles and blood vessels, applying stress on the lungs during breath in and using increased air resistance due to strictly nasal fast breath in or "sniff".

**Alexandra.S., (2005)**

In this study, Strelnikova Breathing Exercises refers to 12 exercises such as, Palms, Shake off hands, Pump, Cat, Hug the shoulders, Hug and push, Head turns, Touch shoulders with ears, up and downs, Rolling, Up-kicks and Back-kicks. Each exercise is done by maintaining proper position and then makes short loud sniffs strongly. The exercises programme includes 12 exercises. The exercise is done 3 times in the morning, afternoon and evening for 5 consecutive days. Each exercise is done in first portion of 4 sniffs, then a short pause, it is continued till 16 sniffs. Each session includes 30 minutes.

### **RESPIRATORY SIGNS**

Respiratory sign is an indication of some medical fact or characteristic that may be detected by health care provider during physical examination of a patient with respiratory problem. Respiratory signs includes respiratory rate, labored breathing, rapid tiring, abnormal sounds associated with breathing, accessory muscle usage, nasal discharge, coughing and fever.

**Miller-Keane., (2003)**

In this study, signs refer to respiratory rate, presence of wheezing and usage of accessory muscle measured by severity and exacerbation grade scale

### **RESPIRATORY PARAMETERS**

Respiratory Parameters are concern with measurable or quantifiable characteristic feature. Respiratory Parameters such as peak expiratory flow

rate, forced vital capacity, forced expiratory volume, timed expiratory capacity, oxygen saturation level, blood gaseous composition and pressure.

**Kindersley., (2007)**

In this study, Respiratory parameters refer to peak flow rate measured by peak flow meter and oxygen saturation level measured by pulse oxy-meter.

### **PEAK FLOW METER**

A peak flow meter is a device that measures how fast air comes out your lungs when you exhale forcefully. This measure is called a peak expiratory flow or "PEF" and is measured in liters per minute.

**Martin Stern., (2003)**

### **PULSE OXI-METRY**

Pulse oxi-metry is a simple non-invasive method of continuously monitoring the percentage of haemoglobin (Hb) which is saturated with oxygen.

**Suchitra.R., (2010)**

### **LOWER RESPIRATORY TRACT INFECTIONS**

Lower respiratory tract infections are inflammation and infection of the airway, lung, bronchi, bronchioles and alveolus characterized by asthma, pneumonia, bronchitis and bronchiolitis.

**Adele.P., (2005)**

In this study, Lower respiratory tract infections refer to children with LRTI, Asthma and Pneumonia who are admitted in inpatient department.

### **HYPOTHESES**

- H<sub>1</sub> - The mean post test scores of respiratory signs is significantly lower than the mean pre test scores among children with Lower respiratory tract infections in experimental group.
- H<sub>2</sub> - The mean post test scores of respiratory parameters is significantly higher than the mean pre test scores among children with Lower respiratory tract infections in experimental group

- H<sub>3</sub> - The mean post test scores of respiratory signs in experimental group is significantly lower than the mean post test scores in control group among children with Lower respiratory tract infections.
- H<sub>4</sub> - The mean post test scores of respiratory parameters in experimental group is significantly higher than the mean post test scores in control group among children with Lower respiratory tract infections.
- H<sub>5</sub> - There will be a significant association between post test scores of respiratory signs among children with Lower respiratory tract infections with their selected demographic variables in experimental group.

### **ASSUMPTIONS**

- Children with Lower respiratory tract infections may have inadequate breathing pattern.
- Nurses have an important role in reducing respiratory signs, improve breathing pattern and improve lung function in children with LRTI.

### **DELIMITATION**

The study is delimited to

Sample size is 60

Data collection period is for 5 weeks.

### **PROJECTED OUTCOME**

The study may help the children with Lower respiratory tract infections to practice the Strelnikova breathing exercises at home thus reducing the frequent occurrence of lower respiratory tract infections and developing complications.

## **CONCEPTUAL FRAME WORK**

The conceptual frame work is comprised of interrelated concept that explains a natural phenomenon.

The study is designed to assess the effectiveness of Strelnikova breathing exercises on respiratory signs and parameters among children with Lower respiratory tract infections (LRTI). The conceptual model for the study is based on modification made on “Nola I J. Pender’s Health Promotion Model (2002-Revised)”.

The Health promotion (HPM) proposed by Nola J. Pender (1982; revised, 2002) was designed to be a “Complementary counterpart to models of health protection”. It defines health as a positive, dynamic state not merely the absence of disease. Health promotion is directed at increasing a client’s level of well being. The health promotion model describes the multi dimensional nature of persons as they interact with in their environment to pursue health.

The Model focuses on the following areas.

- ❖ Individual characteristics & experiences
- ❖ Behaviour specific knowledge & affect
- ❖ Behaviour out come

### **INDIVIDUAL CHARACTERISTICS / EXPERIENCES**

#### **i) Prior related behaviour**

According to the theorist, prior related behaviour describes frequency of the similar behaviour in the past direct and indirect effects on the likelihood of engaging in health promoting behaviour.

In this study the prior related behaviour includes the assessment of demographic variables, Pre assessment of respiratory signs by using severity and exacerbation of grade, peak flow rate by using peak flow meter and assessment of oxygen saturation level by using pulse oxy-meter by observational method.



## **ii) Personal factors**

According to the theorist, personal factors are categorized as biological, psychological and socio-cultural. These factors are predictive of a given behaviour and shaped by the nature of the target behaviour being considered.

In this study the personal factors include age, sex, education, residence, and religion, order of birth, family history of lower respiratory tract infections, pet animals in house, type of allergy, frequency of attack in last year and duration of illness.

## **BEHAVIOUR SPECIFIC COGNITIONS AND AFFECT**

### **a) Perceived benefit of action**

According to the theorist, perceived benefits of action are anticipated positive outcomes that will occur from health behaviour.

In this study the perceived benefits of action helps the child to reduce the episodes of LRTI and to promote lung function.

### **b) Perceived barriers of action**

According to the theorist, perceived barriers actions are anticipated, imagined or real blocks and personal costs of understanding a given behaviour.

In this study the perceived barriers of action is children may have lack of knowledge, lack of practice and lack of motivation regarding breathing exercises.

### **c) Perceived self efficacy**

According to the theorist, perceived self efficacy is judgement of personal capability to organize and execute a health promoting behaviour. Perceived self efficacy influences perceived barriers to action so higher efficacy results in lowered perceptions of barriers to the performance of the behaviour.

In this study the self efficacy is that child realizes the importance of breathing exercises to promote lung function and improve the knowledge and practice which will prevent the recurrent occurrence of lower respiratory tract infections.

**d) Activity related affect**

According to the theorist, activity related affect describes subjective positive or negative feelings occur before, during and following behaviour based on the stimulus properties of the behaviour itself. Activity related affect influence perceived self efficacy, which means the more positive the subjective feeling, the greater the feeling of efficacy. In turn, increased feeling of efficacy can generate further positive affect.

In this study activity related affect is reduction of respiratory signs, symptoms and episodes of children with lower respiratory tract infections.

**e) Interpersonal influences**

According to this theorist, Interpersonal influences cognition concerning behaviours, beliefs, or attitudes of the others. Interpersonal influences include: norms (expectations of significant others), social support (Instrumental & emotional encouragement) and modelling (vicarious learning through observing others engaged in a particular behaviour). Primary sources of interpersonal influences are families, peers and health care providers.

In this study interpersonal influence is that Intervention for reduction of respiratory signs by Strelnikova Breathing Exercises. The exercises programme includes 12 exercises such as, Palms, Shake off hands, Pump, Cat, Hug the shoulders, Hug and push, Head turns, Touch shoulders with ears, up and downs, Rolling, Up-kicks and Back-kicks. Each exercise is done by maintaining proper position and then makes short loud sniffs strongly. The exercise is done 3 times in the morning, afternoon and evening for 5 consecutive days. Each exercise is done in first portion of 4 sniffs, then a short

pause, it is continued till 16 sniffs. Each session includes 30 minutes. The instructional module was distributed to the children to follow it at home.

#### **f) Situational influences**

According to this theorist situational influences are personal perceptions and cognitions of any given situation or context that can facilitate or impede behaviour. Include perceptions of options available, demand characteristics and aesthetic features of the environment in which given health promoting is proposed to take place. Situational influences may have direct or indirect influences on health behaviour.

In this study situational influence is child need to modify the life style, breathing exercises and maintain health status which influence lung function and prevent recurrent occurrence of the respiratory signs.

### **BEHAVIOURAL OUTCOME**

#### **I. Immediate competing demands and preferences**

According to the theory, competing demands are those alternative behaviours over which individuals have low control, because there are environmental contingencies such as work or family care responsibilities. Competing preferences are alternative behaviour over which individual exert relatively high control, such as choice of ice cream or apple for a snack.

In this study Strelnikova breathing exercises may influence the children to gain knowledge on exercises and practice them in reducing the occurrence of respiratory infections and improve lung function among child with lower respiratory tract infections.

#### **II. Commitment to plan of action**

According to the theorist Commitment of plan of action is the concept of intention and identification of a planned strategy leads of implementation of health behaviour.

In this study Commitment of plan of action is the child with lower respiratory tract infections develop positive attitude and makes decision to continue the practice of breathing exercises to healthy life style and maintain health status which improve lung function and prevent recurrent occurrence of the respiratory infections in future.

### **III. Health promoting behaviour**

According to the theorist health promoting behaviour is an end point or action outcome directed toward attaining the health outcome such as optimal well being, personal fulfilment and productive living.

In this study health promoting behaviour of children with lower respiratory tract infections may practice breathing exercises to maintain health status which improve lung function and prevent recurrent occurrence of the respiratory signs.

### **Post test assessment**

In this study Post test assessment of respiratory signs by using severity and exacerbation of grade, peak flow rate by using peak flow meter and assessment of oxygen saturation level by using pulse oxy-meter by observational method was done in experimental group and control group. The respiratory signs were graded as normal, mild, moderate and severe. The peak flow rate was graded as normal, mild, moderate and severe. The oxygen saturation level was graded as normal, mild, moderate and abnormal.

**INDIVIDUAL CHARACTERISTICS AND EXPERIENCE**

- Personal factors**
- Demographic variables**
- Biological factor**
- Age
  - Sex
- Socio cultural factors**
- Education
  - Residence
  - Religion
  - Order of birth
  - Family history of lower respiratory tract infections
  - Pet animals in house
  - Type of allergy,
  - Frequency of attack in last year
  - Duration of illness.

- Prior related behaviour**
1. Assessment of demographic variables
  2. Assessment of respiratory signs by using severity and exacerbation of grade by observation method
  3. Assessment of peak flow rate by using peak flow grade zones by observation method
  4. Assessment of oxygen saturation level by using oxygen saturation scale by observation method

**BEHAVIOURAL SPECIFIC COGNITION & AFFECT**

- Perceived benefit**
- Reduce the episodes of LRTI
  - Promote lung function
- Perceived Barriers**
- Lack of knowledge
  - Lack of practice and motivation
- Perceived Self Efficacy**
- Realize the benefits of breathing exercises
- Activity related affect**
- Reduction of respiratory signs, symptoms and episodes
- Inter personal influences**
- Intervention for reduction of respiratory signs by strelnikova breathing exercise includes 12 exercises such as palms, shake hands, pump, cat, hug the shoulders, hug and push, head turns, touch shoulders with ears, up and downs, rolling, up-kicks and back -kicks. Exercises are done 3 times for 5 days and each exercise includes 30 minutes and instructional module was distributed.
- Situational influences**
- LRTI Children perceives that breathing exercises will improve lung function & reduce respiratory signs

**BEHAVIOURAL OUTCOME**

- Immediate change of practice**
- strelnikova breathing exercises may influence the children to gain knowledge on exercise and practice them in reducing the occurrence of respiratory infections and improve lung function among children with LRTI
- Health promoting behaviour**
- LRI children may practice breathing exercises to improve lung function and reduce occurrence of the respiratory signs.
- Commitment to plan of action**
- LRI children develop positive attitude and make decision to continue practicing breathing exercises to improve lung function and reduce respiratory infections in future.

Post test assessment

**Severity and exacerbation of grade**

Normal	-	0
Mild	-	1 to 3
Moderate	-	4 to 6
Severe	-	7 to 10

**Peak flow grade zones**

Normal	-	90 to 100%
Mild	-	70 to 90%
Moderate	-	50 to 70%
Severe	-	<50%

**Oxygen saturation Level**

Normal	-	98 to 100%
Mild	-	96 to 97%
Moderate	-	91 to 95%
Abnormal	-	<91%

**FIG : 1 CONCEPTUAL FRAME WORK BASED ON MODIFIED PENDER'S HEALTH PROMOTION MODEL (REVISED 2002)**

## **CHAPTER – II**

### **REVIEW OF LITERATURE**

Review of literature it contains two parts

#### **PART-I**

Overview of

- a. Lower respiratory tract infections
- b. Strelnikova breathing exercises

#### **PART-II**

- a. Studies related to prevalence and risk factors of Lower respiratory tract infections among children
- b. Studies related to Lower respiratory tract infections among children
- c. Studies related to use of respiratory parameters among children with Lower respiratory tract infections
- d. Studies related to breathing exercise among children with Lower respiratory tract infections
- e. Studies related to nurses role in prevention of Lower respiratory tract infections among children

#### **PART-I**

##### **a. OVERVIEW OF LOWER RESPIRATORY TRACT INFECTIONS AMONG CHILDREN**

#### **INTRODUCTION**

Lower respiratory tract infection and its complication are most frequent conditions of acute illness in children. In India, LRTI is one of the major causes of childhood death. It is also one of the reasons for which children are brought to the hospitals and health facilities. Most children have 3 to 5 attacks of LRTI in each year.

**Datta.P., (2009)**

## **DEFINITION**

Lower respiratory tract infection (LRTI) is infection below the level of the larynx and may be taken to include: bronchiolitis, bronchitis, pneumonia and asthma.

**Richard.D., (2010)**

## **INCIDENCE**

- In 1990, the World Health Organization (WHO) estimated that LRTI in children (60% due to Streptococcus pneumonia or Haemophilus influenza) caused 4.3 million child deaths worldwide.
- A WHO study in 2004 cited clinical pneumonia in children under 5 years old as the leading cause of childhood mortality in the world. It is estimated that 95% of such infections occur in developing countries.

## **PATHOPHYSIOLOGY**

There is no specific pathophysiology for lower respiratory tract infection (LRTI) that is universally agreed upon. Essentially, it is inflammation of the airways/pulmonary tissue, due to viral or bacterial infection, below the level of the larynx.

**Richard.D., (2010)**

## **CLINICAL MANIFESTATIONS**

- Fever
- Poor feeding and vomiting
- Cough and breathing difficulty
- Nasal block and nasal discharge
- Sore throat and wheeze

**Wong's., (2005)**

## **ALERT TO RESPIRATORY DISTRESS**

- Cyanosis in severe cases
- Grunting and nasal flaring
- Marked tachypnoea

- Chest indrawing
- Other signs such as sub costal recession, abdominal 'see-saw' breathing and tripod positioning.
- Reduced oxygen saturation (less than 95%).

**Richard.D., (2010)**

## **DIAGNOSTIC EVALUATION**

- History collection and physical examination
- Full blood count and microbiological studies
- Imaging: Chest radiography
- Other tests: Tuberculin skin testing and cold agglutinins when mycoplasmal infection is suspected
- Diagnostic procedures: Drainage and culture of pleural effusions may relieve symptoms and identify the infection

## **SPECIFIC DIAGNOSTIC EVALUATION**

### **1. PEAK FLOW METER**

#### **Definition**

A peak flow meter is a device that measures how fast air comes out your lungs when you exhale forcefully. This measure is called a peak expiratory flow or "PEF" and is measured in liters per minute.

**Martin Stern., (2003)**

#### **Use of peak flow meter**

A peak flow meter is a device that measures how well air moves out of a patient's lungs. During an asthma episode, the airways of the lungs begin to narrow slowly. The peak flow meter can be used to find out if there is narrowing in the airways, hours - even days - before the patient has any symptoms of asthma. The peak flow meter can also be used to help:

- Decide if the medicine plan is working well.
- Decide when to add or stop medicine.
- Decide when patient should seek emergency care.
- Identify triggers - that is, what causes patient's symptoms to increase.



All patients age 5 and older who have moderate to severe asthma should be advised to use a peak flow meter. Some children as young as age 3 can also use it.

**American lung association., (2007)**

### **Steps in use of peak flow meter**

A peak flow meter is simple to use. Even children ages 4 and up should be able to perform a PEF with good results. To perform a peak expiratory flow:

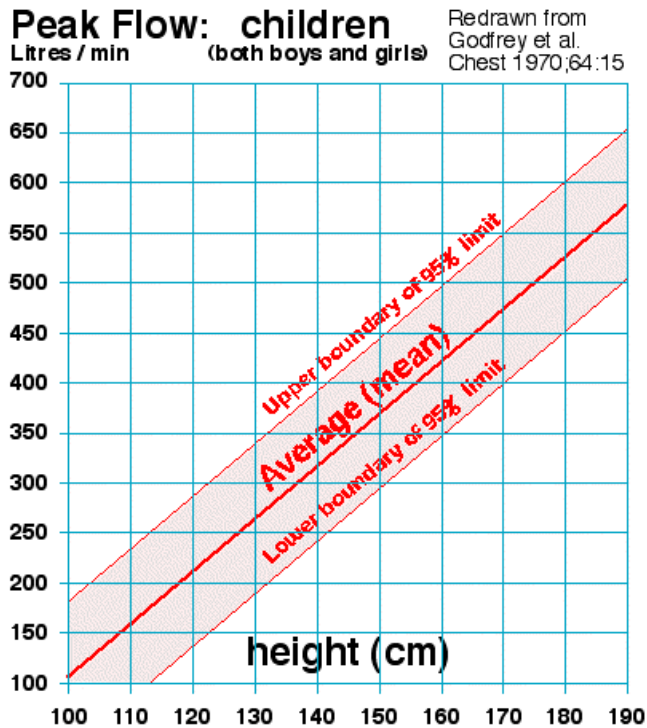
1. Stand up straight.
2. Make sure the indicator is at the bottom of the meter.
3. Take a deep breath filling your lungs completely.
4. Place the mouthpiece in your mouth; lightly bite with your teeth, and close your lips on it.
5. Blast the air out as hard and as fast as possible in a single blow.
6. Record the number that appears on the meter.
7. Repeat these steps three times.
8. Record the highest of the three readings in an asthma diary. This reading is your or your child's peak expiratory flow.

**American lung association., (2007)**

### **Grading of peak flow rate**

Peak flow readings are often classified into 3 zones of measurement according to the American Lung Association; green, yellow, and red. Doctors and health practitioners can develop an asthma management plan based on the green-yellow-red zones.

<b>Peak flow zone</b>	<b>Percentage</b>	<b>Description</b>
Green zone	90 to 100%	Normal
High yellow zone	70 to 90 %	Mild
Low yellow zone	50 to 70 %	Moderate
Red zone	Less than 50%	Severe



$$\text{PFR} = \frac{\text{Personal peak flow rate}}{\text{Predicted peak flow rate}} \times 100$$

Personal peak flow rate: Highest peak flow by the patient

Predicted peak flow rate: Peak flow rate is calculated according to height.

**American lung association., (2007)**

## 2. PULSE OXY-METER

### Introduction

Oxygen saturation is a measure of how much oxygen the blood is carrying. It is expressed as a percentage of the maximum oxygen that the blood could carry. Oxygen saturation can easily be measured at home using a home pulse oxy-meter.

**Fitzalan.G., (2010)**

### Definition

Pulse oxy-metry is a simple non-invasive method of continuously monitoring the percentage of hemoglobin (Hb) which is saturated with oxygen.

**Suchitra.R., (2010)**

### **Mechanism of pulse oxy-metry**

- The pulse oxy-meter consists of a probe attached to the patient's finger or ear lobe which is linked to a computerized unit.
- Within the SpO<sub>2</sub> sensor, light emitting diodes shine red and infrared light through the tissue. Most sensors work on extremities such as a finger, toe or ear.
- The pulse oxy-metry measures the functional saturation which is defined as saturation of hemoglobin capable of carrying oxygen.

**Suchitra.R., (2010)**

### **Oxygen saturation level**

Oxygen saturation	Description
98-100%	Normal
96-97%	Mild
91-95%	Moderate
< 91%	Abnormal

The oxygen saturation level can help indicate the severity of an asthma attack. For example, an oxygen saturation level greater than 95% is typically considered normal. A level between 91% and 95% is considered moderate. And a level below 91% is considered dangerous, indicating that you should seek immediate medical attention.

**Susan.R., (2005)**

### **MANAGEMENT**

- In hospital: Respiratory support as required, intravenous access and fluids in severe cases.
- Drugs: Antipyretics and antibiotic such as penicillin, Vancomycin, and acyclovir (for herpes virus pneumonia)

### **COMPLICATIONS AND PROGNOSIS**

- Bacterial invasion of lung tissue can cause pneumonic consolidation, septicaemia, empyema, lung abscess and pleural effusion.

- Respiratory failure, hypoxia and death are rare unless there is previous lung disease or the patient is immunocompromised.

**Richard.D., (2010)**

## **PREVENTION**

- Prevention is with pneumococcal vaccine and influenza vaccine for high-risk individuals with pre-existing heart or lung disease.
- Smoking in the home is a major risk factor for all childhood respiratory infection.
- Zinc supplementation reduces the incidence of pneumonia by over 40% in malnourished children

**Richard.D., (2010)**

## **► ASTHMA**

### **DEFINITION**

Bronchial asthma is chronic inflammatory disorder of the lower airway due to temporary narrowing of the bronchi by bronchospasm, manifested as dyspnea, wheezing and excessive cough.

**Datta.P., (2009)**

### **INCIDENCE OF BRONCHIAL ASTHMA**

The peak incidence is 5 to 10 years of age. Boys are more affected than girls. In United States who has asthma, an estimated 2 to 5 percent are school-age children. It is the leading cause of chronic disability in childhood and accounts for 25% of all school absences in children under 17 years of age. The onset of asthma usually occurs during the first five years of life.

**Datta.P., (2009)**

### **TRIGGERS TENDING TO PRECIPITATE OR AGGREVATE ASTHMATIC EXACERBATIONS**

- Allergens
  - Outdoor -trees, shrubs, weeds, air pollution and spores.
  - Indoor - dust or dust mites, mold, and cockroach antigen.
- Irritants: tobacco smoke, weed smoke odours, sprays
- Exposure to occupational chemicals

- Exercises and infections
- Changes in weather and environmental changes
- Animals: cats, dogs, rodents, horses
- Medications: aspirin, non steroidal anti-inflammatory drugs, antibiotics, beta blockers.
- Strong emotions: fear, anger, laughing and crying
- Conditions: gastro-esophageal reflux and tracheo-esophageal fistula
- Foods: nuts and milk or other dairy products
- Endocrine factors: thyroid disease

**Wong's., (2009)**

### **CLINICAL MANIFESTATION**

- ❖ **Cough:** Hacking, paroxysmal, irritative, non productive and productive of frothy, gelatinous sputum.
- ❖ **Respiratory related signs** such as shortness of breath, prolonged expiratory phase, audible wheeze, may have a molar flush and red ears, lips deep-dark red color, may progress to cyanosis of nail beds, restlessness, apprehension, prominent sweating, older children sitting upright with shoulders in a hunched-over position hands and speaking with short, panting, broken phrases.
- ❖ **In Chest** - hyper resonance on percussion, coarse-loud breath sound, wheezes throughout the lung fields, prolonged expiration, crackles and generalized inspiratory and expiratory wheezing, increasingly high pitched.
- ❖ **With repeated Episodes** shows barrel chest, elevated shoulders use of accessory muscles of respiration and prominent upper teeth.

**Wong's., (2009)**

### **DIGNOSTIC EVALUATION**

- History collection and physical examination

- Pulmonary function test
- Blood investigations and absolute eosinophil count
- Chest x-ray and allergy test

**Datta.P., (2009)**

## **MANAGEMENT**

### **Aim for**

- ❖ Freedom from Symptoms- including nocturnal cough, Acute attacks and emergency hospital visits, Frequent school absenteeism and Adverse drug effects
- ❖ Normal daily activities, sport participation, growth charts and Peak expiratory flow / spirometer.

## **TOWARDS REACHING THE GOALS**

- ❖ Patient education
- ❖ Pharmacotherapy
  - ▶ Initiating inhaled therapy
  - ▶ Selecting the optimal preventive regimen
- ❖ Dealing with triggers / precipitants
- ❖ Follow up and Dealing with poor asthma control

**IAP Respiratory chapter., (2003)**

## **PREVENTION**

Bronchial asthma is not generally considered preventable. It has been suggested that avoidance of certain foods (eggs, chocolate, berries, tomatoes, citrus fruits, fish) in infancy may decrease the possibility of developing bronchial asthma associated with allergy, although research studies does not support any suggestion.

## **COMPLICATIONS**

Complications are emphysema, severe hypoxemia, cardiac arrhythmias, atelectasis, pneumo-mediastinum, bronchiectasis, Cor-pulmonale, respiratory failure and congestive cardiac failure.

**Datta.P., (2009)**

### **3. PNEUMONIA**

#### **DEFINITION**

Pneumonia is the infection of the lung parenchymal tissue. There is consolidation of alveoli or infiltration of the interstitial tissue with inflammatory cells.

**Datta.P., (2009)**

#### **EPIDEMIOLOGY**

Pneumonia may occur as primary infection or secondary infection. The causative organisms of the infections include the following: bacterial, viral, mycoplasma, fungal, protozoal and miscellaneous.

#### **CLASSIFICATION**

- ❖ Bronchopneumonia – patchy involvement of lungs
- ❖ Lobar pneumonia – one or more lobes of lung involved
- ❖ Pneumonitis – alveoli or interstitial tissue between them affected.

**Datta.P., (2009)**

#### **SIGNS AND SYMPTOMS**

- ❑ Fever – usually high
- ❑ Respiratory symptoms - cough, nasal flaring, tachypnea, dullness with percussion, chest pain, breath sound are crackles, wheeze, rales, retraction and pallor to cyanosis.
- ❑ Chest x-ray – patchy infiltration with peribronchial distribution
- ❑ Behaviour – irritability, restlessness, malaise and lethargy
- ❑ Gastro intestinal – anorexia, vomiting, abdominal pain and diarrhea

## **MANAGEMENT**

- Symptomatic treatment
- Antibiotics
- Supportive measures
- Complicated case need surgical measures

**Wong's., (2009)**

## **COMPLICATIONS:**

- Pleural effusion
- Emphysema
- Atelectasis
- Lung abscess
- Pneumothorax

## **PREVENTION**

- Heptavalent pneumococcal vaccine
- Early identification and treatment

**Wong's., (2009)**

## **b. OVERVIEW OF STRELNIKOVA BREATHING EXERCISES**

### **INTRODUCTION**

Strelnikova breathing exercises had great results of 4 years old child with respiratory problems including chronic cough, wheezing, night attacks of shortness of breath needing a bronchodilator (doctor identified possible asthma and prescribed 6 month of steroid treatment). Since they started exercising once a day (child doing it too) there was none of the above symptoms for already 6 month and counting and had amazing result without any medications.

### **HISTORY OF STRELNIKOVA BREATHING EXERCISES**

This breathing exercise have been developed by Alexandra Severovna Strelnikova and further developed by her daughter Alexandra Nikolaevna and their follower **Michial** Shetinin. Original application was for restoring of voice for singers but later it has been shown that method is effective for treatment



and prophylactic of wide range of respiratory illness, in particular asthma, tuberculosis, pneumonia and chronic bronchitis. The main idea of the exercise is to exert a strong nasal breath- in (sniff) while compressing the lungs by a simultaneous training of different muscles.

## **DEFINITION**

**Strelnikova Breathing Exercises** is a paradox - exercise that specifically develops muscles and blood vessels, applying stress on the lungs during breath in and using increased air resistance due to strictly nasal fast breath in or "sniff".

**Alexandra.S., (2005)**

## **MECHANISM OF STRELNIKOVA BREATHING EXERCISES**

The main requirement of the exercise is to think about inhalations, exercise inhalations and count inhalations. Short sniffs are performed simultaneously with exercises pressing the chest. It improves nasal breathing and arouses the diaphragm activity. Even the first hour of exercises enlarges vital lung capacity by 0.1 to 0.3 liter and normalizes the gas content in the blood, increasing drastically the amount of oxygen in it.

## **GENERAL APPROACH**

Here is the general idea that applies to each of 12 exercises

Do strong (audible) sniffs with nose only as you make (finish) a movement, and don't worry about the breathing out, it should come naturally. Sniff should be not prolonged or deep, but short and strong so that somebody could hear it from other side of the room.

Each exercise is done in first in portions of 4 sniffs, then short pause, then again. When this is easy go to 8 sniffs and then 16 without break. Totally make for each exercise 3 times 16 sniffs.

### (1) Palms

Stand straight, bend hands with elbows down, showing your palms forwards towards an imaginary viewer in front of you. Make short loud sniffs while strongly and forcefully "grabbing" air with your fingers, forming a fist. When making a break between each 4 (or 8 or 16 sniffs, depending on your preference) lower and relax your hands.



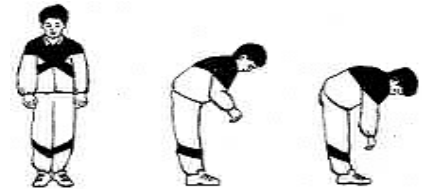
### (2) Shake off hands

Stand straight, place hands on the level of your belt; fingers are pressed in a fist. Make a short strong sniff, while pushing your fist down and backwards, as if shaking something off your hands. Return hands to the belt level and repeat.



### (3) Pump

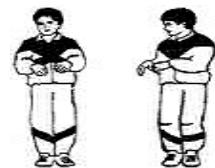
Stand straight with feet a bit wider than shoulders. Lean slightly forwards as your hands push down as if pressing a ball on the floor. Palms reach about the level of knees.



Sniff at the end of the movement

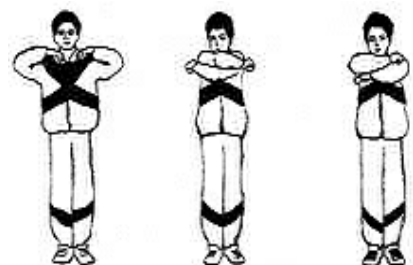
### (4) Cat

Stand straight, feet on shoulder width. Make dance-like sitting down with simultaneous turn of upper-body and hands to the right as if catching something. At the end of movement, when you catch - sniff. Repeat same to the left.



### (5) Hug the shoulders

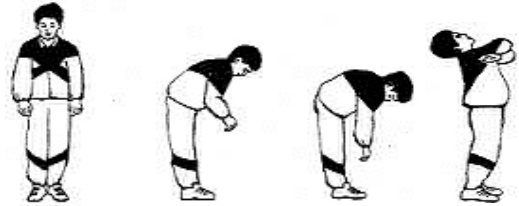
Stand straight with hands up on the level of your shoulders and bent so that they make together a square. Move strongly both hands towards each other until they make together a triangle - at the



end of the movement sniff. At the moment of movement head can swing slightly backwards.

### (6) Hug and push

Stand straight with feet a bit wider than shoulders. Lean slightly forwards as you hands push down as if pressing a ball on the floor. Palms reach about the level of



knees. Sniff at the end of the movement. So far it is same as exercise (3). Now straighten up and make "Hugging" also with the sniff when hands reach "triangle" position. Repeat while counting sniffs in 4 portions.

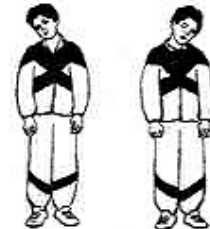
### (7) Head turns:

Stand straight, feet on shoulder width. Turn head left - sniff at the end of movement, then right - sniff and the end of movement. Don't stop in the middle, only at the right and left end of the turn. Only head turns, body is not moving.



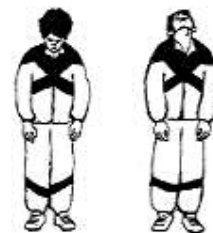
### (8) Touch shoulders with ears (I call it "surprised dog")

Stand straight, feet slightly narrower than shoulder width. Lean the head right so that ear almost touches the shoulder. Sniff at the end of movement. Repeat to the left.



### (9) Up and downs

Stand straight, feet slightly narrower than shoulder width. Lean head forwards (facing floor) - sniff. Lean head backwards (facing ceiling) - sniff. Note that in all exercises sniff does not come after the movement, but simultaneously with last phase of the movement and finishing together with the movement as if caused by the movement.



### **(10) Rolling**

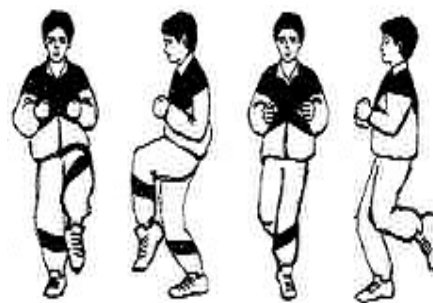
Stand so that left foot is forwards and straight, right foot is backwards and bent (as if in rapier fighting position). Place the weight on left foot. Now slightly sit down on left foot, bending it as if dancing. Simultaneously with end of the movement make sniff. Now move weight on the right foot (which is place backwards) and slightly sit on it, bending it more and making sniff at the end of movement. Repeat both movements while counting sniffs.



### **(11) Up-kicks**

(See left image) Stand straight, feet slightly narrower than shoulder width. Pull up left foot; bend in the knee, so that knee reaches the level of the abdomen.

From the knee down the foot is straight, pull the toe forward as in ballet. In the same time slightly sit down on the right foot and make strong short audible sniff. Get both feet completely straight for a moment. Repeat same with right foot up so that knee reaches abdomen, while sitting down slightly on left knee and sniffing. Upper body remains straight.



### **(12) Back-kicks**

(See right image above) Stand straight, feet slightly narrower than shoulder width. Move left foot; bend in the knee, backwards as if kicking you on the bottom with the sole. Simultaneously slightly sit-down on the right foot and make a short strong sniff. Get both feet completely straight for a moment, than repeat same with opposite foot.

**Strelnikova.A., (2005)**

## **PART-II**

### **a. STUDIES RELATED TO PREVALENCE AND RISK FACTORS OF LOWER RESPIRATORY TRACT INFECTIONS AMONG CHILDREN**

**Chakravarthy., (2000)** conducted a study to estimate the prevalence of asthma in children and to study the possible differences in prevalence of childhood asthma in rural and urban area of Tamil Nadu. A total of 584 children from Chennai and 271 children from 25 villages around Chennai formed the urban and rural groups. Data was collected using a simplified version of International Study of Asthma and Allergy in Children questionnaire administered by trained students. The analysis was done separately for children 0-5 and 6-7 years of age. Of the 855 children studied, the overall prevalence of breathing difficulty was 18% and the prevalence of diagnosed asthma was 5%. 22% of urban and 9% rural children of 6 to 12 years reported breathing difficulty at any time in the past ( $p<0.01$ ). A significantly higher proportion of 6 to 12 years of urban children also reported nocturnal dry cough (24.4%v.18.7%,  $p<0.05$ ). Urban children reported recent wheeze more often than rural children (92%v.77%,  $p=0.01$ ).

**Daljith Singh., (2002)** conducted a study to determine the prevalence, age distribution and epidemiological factors associated with asthma in 5 villages of Dehlon block of Ludhiana. Prospective study design was used. The study group composed of 2,275 children, 1,253 males and 1,022 females. Statistical analysis was done by Fischers Z test. Data was obtained using questionnaire and screening of prescriptions and documents. The study results revealed that, 37.9% children with asthma had the family history of allergy, 13.8% of cases had the family history of smoking, overcrowding was noted in 55.2% and pet animals 13.85%. The mean loss of school days over one year was 16.5 days. Out of 2,271 children 58 were diagnosed to have asthma (34 males and 24 females) giving the prevalence rate of 2.6%. A significant association was found between family history of smoking and asthma ( $p<0.05$ ).

**Gulam Mustafa., (2002)** conducted a study to assess the prevalence of nocturnal asthma of school children of South Punjab. It was a cross sectional, questionnaire based, descriptive survey of the children aged 1 to 18 years, in randomly selected primary and secondary schools. 6120 questionnaire was sent to the parents. Of them 3180 (52%) were received back. The data analysis was made by statistical analysis. Of the 3180 respondents, 1767(56%) were for boys and 1413 (44%) were for girls. The median age was 8.25 years. Around 71% of children were between 4 to 11 years of age. The parents reported nocturnal asthma in 177 (6%) of their children with their equal prevalence in boys and girls. Of this 99 (56%) were boys and 78 (44%) were girls. Of the 1767 boys and 1413, girls the nocturnal asthma reported by parents was 6% each. The nocturnal asthma was not reported in 14 to 18 years age group of females.

**Ranabir., (2009)** conducted a study to assess the prevalence rate of bronchial asthma among Indian children. Literature search for data analysis was done through the extensive search in websites based population survey reports. The statistical analysis was done by mean and median. 15 epidemiological studies are identified on the development of asthma in Indian children from 300 relevant articles. The study results revealed that, the mean prevalence was  $7.24 \pm SD 5.42$ . The median prevalence was 4.75% (with IQR=2.65-12.35%). Overall weighed prevalence was found to be 2.74. Childhood asthma among children 13-14 years of age was lower than the younger children (6-7 years of age). Urban and male predominance with wide inter- regional variation in prevalence was observed.

**Pradeep.M.J.et.al., (2007)** conducted a prospective case control study to identify the risk factors of acute respiratory tract infection among 208 children aged 5 to 10 years in Cheluvambu government medical college hospital, Mysore. Pre designed profoma was used to assess the risk factors involved in the subjects. Chi square test was used for statistical analysis where p value  $<0.05$  was taken as significant. Logistic regression method was used by SPSS package for

data analysis. The study result shows that inappropriate immunization for age (21.2%vs 7.69%), families having more than two under five children at home (30.1 vs 11.4) and overcrowding (91.3 vs 20.19) are highly associated with respiratory tract infection. However there was no significant association between vitamin A deficiency, low birth weight and pneumonia.

**Forno.E., (2010)** conducted study on Risk factors and predictive clinical scores for asthma exacerbations in Costa Rican children at USA. The design used is cross-sectional study design. A clinical score, consisting of a checklist questionnaire made up of 17 yes-no questions regarding asthma symptoms, use of medications and health-care services, and history, was built and validated. It was then evaluated using data from the Childhood Asthma Management Program (CAMP). Compared with children at average risk for an exacerbation in the Costa Rican validation set, the odds of an exacerbation among children in the low-risk (OR, 0.2; 95% CI, 0.1-0.4) and high-risk (OR, 5.4; 95% CI, 1.5-19.2) score categories were significantly reduced and increased, respectively. In CAMP, the hazard ratios for an exacerbation after 1-year follow-up in the low-risk and high-risk groups were 0.6 (95% CI, 0.5-0.7) and 1.9 (95% CI, 1.4-2.4), respectively, with similar results at 2 years.

**Pereira.L.M.et.al., (2010)** conducted study on, Health burden of co-morbid asthma and allergic rhinitis in children attending asthma clinics in selected public sector health clinic, Trinidad. Children (393) were between 2-17 years and included 239 (60.8%) boys and 154 (39.2%) girls. As many as 53.9% of children sampled 95% suffered from AR. Children exposed to household smoking were nearly twice as likely to have AR ( $p < 0.0041$ , OR=1.9, CI 1.22-2.88). Significantly ( $p < 0.01$ ) more asthmatics with AR (154, 58.6%) visited Accident and Emergency (A&E) in the past 12 months. The average frequency of A&E visits was higher in children who also suffered from AR (1.75 vs 1.36,  $p < 0.04$ ). Age was negatively correlated (-0.21,  $p < 0.005$ ) with exacerbation frequency for asthmatics without AR suggesting A&E visits are independent of age in co-morbid disease. More children with AR (>60%) suffer day and night

symptoms ( $p < 0.001$ ), and miss school (59.8%) ( $p < 0.03$ ) at least once a week ( $p < 0.002$ ) than asthmatics without AR (OR=1.5, 95% CI=1.03-2.30).

## **b. STUDIES RELATED TO LOWER RESPIRATORY TRACT INFECTIONS AMONG CHILDREN**

**Henderson.et.al., (2001)** conducted a case-control study for 343 children ranging from 7 to 12 yr of age in New Zealand. Quasi experimental design and Random sampling technique was used. Positive skin tests for allergy were observed in 35% of children without recurrent wheezing, and in 77% of children who had experienced from two to four episodes and 90% children experience five or more episodes, respectively, of recent wheezing. Data analysis was done by logistic regression analysis. The study result reveals that sensitization to dust mite (odds ratio [OR]: 5.2; 95% CI: 3.0 to 9.0), cat (OR: 15.5; 95% CI: 3.4 to 70.8), antigens was consistently associated with recurrent wheezing. Sensitization to pollen antigen(s), observed in 60% of allergic children, was not associated with wheezing.

**Weber.M.et.al., (2004)** conducted a study to determine clinical correlates and outcome of hypoxaemia in children admitted with an acute lower respiratory tract infection in Paediatric wards of Victoria Hospital at Gambia. The design used was Prospective cohort study design and the samples are enrolled in a randomized trial. The study population was 1072 of 42,848 children, aged 2 to 33 months who were with an acute lower respiratory tract infection to two of three hospitals. The tool consist of demographic variables and arterial oxygen saturation  $< 90$ . Data analysis used for study is Logistic regression. The result says that cyanosis, a rapid respiratory rate, grunting, head nodding, absence of a history of fever, and no spontaneous movement during examination were significantly associated with hypoxemia.

**Flower.J.et.al., (2005)** conducted a study on, Assessing the capability of school-age children with asthma to safely self-carry an inhaler in Golden Valley. It is a



descriptive study. Asthma Assessment Interview (AAI) was used as a tool. A random sample of 34 students with asthma from a mid western school district were interviewed by the school nurse using the AAI, which assesses knowledge of asthma, symptoms, coping strategies, medication administration skills, triggers, and judgment about when to use an inhaler including the ability to tell time. Only 38% passed the AAI. No students ages 5 to 7 passed, fewer than 50% of students ages 8 to 10 passed, and half or more of students age 11 or older passed the AAI. Results suggest a school nurse should supervise elementary students when using an inhaler; most should not self-carry.

**Yang. B.H.et.al., (2005)** conducted a study on Effects of nursing instruction on asthma knowledge and quality of life in schoolchildren with asthma in Taiwan. The issue of whether nursing instruction efforts could improve asthma knowledge and quality of life among schoolchildren was investigated using a quasi-experimental design. The key instruments were the Asthmatic Knowledge Questionnaire and the Childhood Asthma Questionnaire-Form B. Asthmatic knowledge increased among children who received instruction from nurses (Mean pre/post=22.20/31.87,  $p<.05$ ). These children also experienced significant improvements in their active quality of life (Mean pre/post=27.53/30.20, $p<.05$ ), and decreased distress (Mean pre/post=24.04/10.86,  $p<.05$ ) and asthma severity (Mean pre/post=13.27/8.3,  $p<.05$ ). This study finds nursing instruction helpful in improving asthma knowledge. However, in terms of quality of life, elevated knowledge has a marked (negative) correlation only with levels of distress and severity. This result can provide guidance for nursing personnel in developing nursing instruction to improve active quality of life in child patients.

**Carroll.C.L., (2007)** conducted study on complications in children with status asthmaticus in Hartford. A retrospective review of the complication profile and hospital course of all children admitted to a PICU with status asthmatics over a 9 years period. Twenty-two (8%) of the 293 children admitted to the ICU with status asthmaticus experienced one or more complications such as aspiration pneumonia, ventilator-associated pneumonia, Pneumo mediastinum,

Pneumothorax. Incubated children were significantly more likely than non-intubated children to experience a complication (RR 15.3; 95% CI 6.7-35). Fifteen (42%) of the 36 intubated children experienced a complication. Intubated children experiencing a complication had significantly longer duration of mechanical ventilation, ICU length of stay and hospital charges than intubated children not experiencing a complication

**Chaves.T.C.,(2010)** conducted study on, Cranio cervical posture and hyoid bone position in children with mild and moderate asthma and mouth breathing, Brazil. The study was conducted on 56 children, 28 of them with mild (n=15) and moderate (n=13) asthma (14 girls aged 10.79+/-1.31 years and 14 boys aged 9.79+/-1.12 years), matched for sex, height, weight and age with 28 non-asthma children who are not mouth breathers. The sample size was calculated considering a confidence interval of 95%. The independent t-test was used to compare means values and the chi-square test to compare percentage values ( $p < 0.05$ ). Intra class correlation coefficient (ICC) was used to verify reliability .The Cranio vertebral Angle (CVA) was found to be significantly smaller in asthma than in control children (106.38+/-7.66 vs. 111.21+/-7.40,  $p=0.02$ ) and the frequency of asthma children with an absent or inverted hyoid triangle was found to be significantly higher compared to non-asthma children (36% vs. 7%,  $p=0.0001$ ). The values of the inclination angles of the superior cervical spine in relation to the horizontal plane were significantly higher in moderate than in mild asthma children.

### **c. STUDIES RELATED TO USE OF RESPIRATORY PARAMETERS AMONG CHILDREN WITH LOWER RESPIRATORY TRACT INFECTIONS**

**Bishop.J.et.al., (1992)** conducted a study on the properties and reliability of clinical severity scale in Royal Children's Hospital, Australia. The inter-observer agreement (reliability) and validity of a clinical asthma severity scale (ASS) derived from separate scores of wheeze; heart rate and accessory muscle use were studied in 60 children. Independent assessments were made by two paediatricians, and they also rated patients as having a mild, moderate, severe or very severe

acute episode. Oxygen saturation (SaO<sub>2</sub>) was categorized as mild, moderate, and severe. Agreement between clinicians was assessed by the weighted kappa statistic (kappa W). Agreement for the ASS score compared to the severity grade obtained from SaO<sub>2</sub> was slight (kappa W = 0.34) and compared to CJR the kappa W was 0.55. An ASS score of moderate or worse had sensitivity of 97% and specificity of 50% for prediction of admission. The maximum frequency and duration of nebulizer therapy following admission were significantly greater for severe patients than for moderate patients. Length of hospital stay did not reflect the ASS score in the emergency department but total duration of functional disability increased with ASS score.

**Richard.J.S., (2002)** conducted a study to determine the ability of patients with acute asthma exacerbations to adhere the Guidelines and to define characteristics associated with improper use. Participants of the study are Children and adolescents aged 2-18 years with acute asthma exacerbations in the emergency department of a children's hospital, Pune. A prospective study design was used in this study. The patients were instructed to use a placebo Meter dose inhaler. Technique was graded on the basis of performance of specific steps recommended by national guidelines. The study result shows that 33 (45.2%) of 73 patients using an MDI improperly compared with 60 (44.4%) of 135 using an MDI with a holding chamber ( $P=.92$ ). In the MDI group, young ages of the patients ( $P_.008$ ) and the parents ( $P_.003$ ) were associated with improper use. 83 out of 111 patients demonstrated perfect performance of all Peak flow meter steps. A greater emphasis must be placed on teaching methods to optimize drug delivery and to instruct patients about the importance of self-monitoring of disease.

**McClure.L., (2007)** conducted a study to know the prevalence of lower respiratory tract infection of children, by use of peak flow meter in Central America. 12,245 urban children with persistent asthma were enrolled in a school-based study. Self-monitoring of symptoms or peak flow monitoring (PFM) is recommended for all asthma patients. The mean age of the children was 10.0 (SD

2.1) years; 57% were male and 91% were African American. 98% (n = 11,974), confirming the peak flow meter readings reported by the children. The prevalence of reported asthma symptoms varied across PFM readings; the highest prevalence occurred in the setting of red zone readings, with intermediate prevalence in the setting of yellow zone readings, and lowest prevalence in the setting of green zone readings. There was no significant relationship between the symptoms with the hospital care.

**Gary.c.et.al., (2009)** conducted a study to assess the effectiveness of bronchodilator therapy an improvement of acute asthma in Switzerland. 135 children (1-15 years) were selected for the study presenting to an emergency room with mild/moderate ( $\text{SaO}_2 > 91\%$ ) and severe ( $\text{SaO}_2 \leq 91\%$ ) asthma. Peak expiratory flow and Oxygen saturation level was measured before and 30 min after salbutamol inhalation.  $\text{SaO}_2$  was inversely related to initial  $\text{SaO}_2$  ( $p < 0.01$ ) with the greatest rise (7%) occurring in children with the lowest initial level (84%).  $\text{SaO}_2$  increased more in the severe group than the mild to moderate group—2.3% versus 0.6% respectively ( $p < 0.01$ )—although the change in peak expiratory flow (PEF) was similar for both groups. Thus, salbutamol usually improves hypoxia in severe asthma, but  $\text{SaO}_2$  is not a reliable guide to response to initial bronchodilator therapy in the majority of children with asthma ( $\text{SaO}_2 \geq 91\%$ ) as it usually increases little and does not reflect increase in PEF.

#### **d. STUDIES RELATED TO BREATHING EXERCISE AMONG CHILDREN WITH LOWER RESPIRATORY TRACT INFECTIONS**

**Gozal., (1999)** conducted a study on long-term effects on strength and load perception of Respiratory muscle training in neuromuscular disease in Tulane University, New Orleans. The purpose of the study is deterioration of respiratory muscle function in patients with neuromuscular disorders. 21 children with Duchenne's muscular dystrophy or spinal muscular atrophy type III are included in the study. Subjects were randomly allocated to undergo incremental RMT with resistive inspiratory and expiratory loads for a period of 6 months (trained group, TR) or to perform similar exercises with no load

(NT). Maximal static inspiratory and expiratory pressures and RLP (modified Borg visual analog scale 0-10) were assessed on two separate occasions before beginning of the training protocol, monthly throughout RMT duration, and every 3-6 months upon cessation of RMT for 1 yr. Training in neuromuscular disorder (NMD) patients was associated with improvements in experimental group. Similarly, RLP significantly decreased during the RMT period in TR (mean delta:1.9 +/- 0.3;  $P < 0.01$ ) but did not change in NT (-0.2 +/- 0.2). Although RMT increases in expiratory muscle strength are rapidly reversible, long-lasting improvements in RLP occur and could be associated with decreased respiratory symptoms

**Niedziocha., (2001)** conducted a study to evaluate the effect of breathing exercises on individuals with asthma, at Mater Hospital in Brisbane. 489 Participants were split into two groups, one group did the Buteyko breathing exercises and the other group did not. Both groups were instructed to use their asthma medication only if they absolutely had asthma. Over a three-month period, bronchodilator use for the exercisers decreased by 90%, inhaled steroid use decreased by 49%, asthmatic symptoms decreased by 71% and quality of life improved by 54%. This compared with the non-exercisers whose bronchodilator use increased by 9 percent and inhaled steroid use did not change

**Lindmark., (2002)** conducted a study to investigate the effects of deep-breathing exercises on pulmonary function, atelectasis, and arterial blood gas levels after surgery in Sweden. A prospective, randomized trial with patients performing deep-breathing exercises ( $n = 48$ ) were compared to a control group ( $n = 42$ ) who performed no breathing exercises postoperatively. The patients in the deep-breathing group were instructed to perform breathing exercises hourly during daytime for the first 4 postoperative days. The exercises consisted of 30 slow, deep breaths performed with a positive expiratory pressure blow-bottle device. Post test by spirometric measurements, spiral CT arterial blood gas analysis, were performed on the fourth postoperative day. Compared to the

control subjects, the patients in the deep-breathing group had a significantly smaller reduction in FVC (to  $71 \pm 12\%$ , vs  $64 \pm 13\%$  of the preoperative values;  $p = 0.01$ ) and FEV<sub>1</sub> (to  $71 \pm 11\%$ , vs  $65 \pm 13\%$  of the preoperative values;  $p = 0.01$ ). 72% of the patients experienced a subjective benefit from the exercises. Children performing deep-breathing exercises after surgery had significantly smaller atelectatic areas and better pulmonary function on the fourth postoperative day compared to a control group performing no exercises.

**Michail.S., (2005)** conducted a study to assess effectiveness of strelnikova breathing exercises among children in Russian hospital. 70 Children were participated in the study with middle degree and children with severe asthma. The exercises provided for the children and observations were performed for 2 months. 6 Lessons once a week with 1.5 hours duration was given. Results were evaluated by spirometry and symptoms dynamic. Average pre test value of Forced Vital Capacity is 89%, Forced Expiratory Volume is 81% and Average post test value of FVC is 100%, FEV is 95%. There was reduction in number of attacks, reduction of cough and improve nasal breathing.

**Pneumol.B.J., ( 2008)** conducted study on, Inspiratory muscle training and respiratory exercises in children with asthma in Portuguese. A randomized analytical study involving 50 children with asthma allocated to one of two groups: an IMT group, comprising 25 children submitted to IMT via an asthma education and treatment program; and a control group, comprising 25 children who were submitted only to monthly medical visits and education on asthma. The IMT was performed using a pressure threshold load of 40% of maximal inspiratory pressure (MIP). The results were evaluated using analysis of variance, the chi-square test and Fisher's exact test, values of  $p > 0.05$  being considered significant. In the comparative analysis, pre- and post-intervention values of MIP, maximal expiratory pressure (MEP) and PEF increased significantly in the IMT group: MIP from  $-;48.32 \pm 5.706$  to  $;109.92 \pm 18.041$  ( $p < 0.0001$ ); MEP from  $50.64 \pm 6.55$  to  $82.04 \pm 17.006$  ( $p < 0.0001$ ); and PEF from  $173.6 \pm 50.817$  to  $312 \pm 54.848$  ( $p < 0.0001$ ). In the

control group, however, there were no significant differences between the two time points in terms of MIP or MEP, although PEF increased from 188 +/- 43.97 to 208.80 +/- 44.283 ( $p < 0.0001$ ). There was a significant improvement in the severity variables in the IMT group ( $p < 0.0001$ ).

**Dasmen., (2010)** conducted an interventional study of few-minute breathing exercise program as a treatment modality for asthma and to evaluate its efficacy in improving associated clinic-immunological symptoms in Kuwait. Non-Randomized study design was used. Clinical assessment includes physical exam, asthma control/ quality of life questionnaires, pulmonary function tests, and lung inflammation test. About 200 individuals with asthma are divided into two groups: The intervention group and control group. The intervention group will receive standard asthma care along with breathing/mild physical exercise. The control group will be the asthmatic patients who are not willing to receive the exercise intervention. Participants in experimental group performed 2-4 sessions of the prescribed exercise every day (One session: deep breathing 5-10 times and upper body stretching 5-10 times). The exercise was done for 3 to 6 months. The study results revealed that about 86% of the participants in experimental group had good quality of life and good lung function after the intervention. In control group the effectiveness was only for 73%. Hence this reduction of asthma symptoms in experimental group than the other, but that these are not a substitute for medication However, there was no significant difference in the need for inhalers.

**Bianchi.et.al., (2011)** conducted a study to evaluate the effects of a respiratory exercise program tailored for children with asthma in Brazil. This is an open trial study. Fourteen patients concluded the 16-week respiratory exercise program. All the patients were evaluated with regard to lung function, respiratory muscle strength, aerobic capacity, quality of life and clinical presentation. The patients participated in 1-hour sessions that took place twice a week in the morning. Descriptive analysis was done. Considerable improvement in quality of life was also observed. During the study period, a significant difference was observed in

the percentage of days when the patients recorded coughing ( $p = 0.02$ ), shortness of breath ( $p = 0.03$ ), night waking due to shortness of breath, and the use of bronchodilating agents ( $p = 0.04$ ). A month after intervention of the exercise program, however, these asthma symptoms worsened. After 16 weeks of this open-trial intervention, significant increases in maximum inspiratory pressure and maximum expiratory pressure (27.6% and 20.54%, respectively) were demonstrated. The clinical evaluations and daily recorded-symptoms diary also indicated significant improvements and fewer respiratory symptoms.

**e. STUDIES RELATED TO NURSES ROLE IN PREVENTION OF LOWER RESPIRATORY TRACT INFECTIONS AMONG CHILDREN**

**Rupert., (2001)** conducted a study to ascertain the role and confidence levels of the practice nurse in diagnosis and management of asthmatic patients in west Bengal. Data was collected by assessing the practice of nurses in asthma management, extent of services and confidence level of nurse in this role. 64 respondents are participated in the study. Dedicated asthma clinics operated in 47% of practices, 87% undertaken by the nurse alone. Responsibilities undertaken by nurse alone included: instruction of inhaler technique 93%, supervising self-management plans 87%, changing medication dosage 71%, withdrawing treatment 53%, diagnosing asthma 45% and managing acute exacerbations 29%. Nurses initiated treatment alone, without consulting a doctor, as follows; inhaled bronchodilators 55%, long acting bronchodilator 54%, inhaled steroids 56%, oral steroids 15%, anti-leukotrienes 5% and theophyllines 3%. The confidence level of the nurses performing these tasks was high. Formal training had been undertaken by 74% of respondents. There were statistically significant associations between performance of organizational tasks and training.

**Janet.M., (2008)** conducted a study to estimate the effects of asthma education on children use of acute asthma care services in California. It is a meta analysis. 14 to 1033 children under the age group 2 to 17 years who were residing in United States are included in the study. The research design was



randomized controlled trials. Q statistics was used for data analysis at the stata 9.0. The pooled estimates indicate that pediatric asthma education reduces both mean number of hospitalizations ( $n = 5$  studies; SMD:  $-0.35$ ; 95% confidence limits [CLs]:  $-0.63, -0.08$ ) and mean number of ED visits ( $n = 13$  studies; SMD:  $-0.17$ ; 95% CLs:  $-0.31, -0.03$ ) but had a greater affect on mean number of hospitalizations. Pediatric asthma education was also associated with a trend toward lower odds of having an ED visit ( $n = 10$  studies; odds ratio [OR]:  $0.78$ ; 95% CLs:  $0.61, 1.01$ ). Education had no effect on the odds of hospitalization ( $n = 8$  studies; OR:  $0.87$ ; 95% CLs:  $0.60, 1.27$ ) or mean number of urgent physician visits ( $n = 4$  studies; SMD:  $0.02$ ; 95% CLs:  $-0.20, 0.23$ ).

**Shan.A., (2008)** conducted a study to assess the knowledge of childhood asthma among nurses in New Delhi, India. It is a cross sectional study design, a total of 157 nurses were interviewed using a validated questionnaire. The response rate was 78.5%. The entire nurse included in the study had 76% adequate of knowledge on treatment, safety of inhalers, oral steroids and the role of medicine in prevention of asthma attack. 80% of the nurses lacked knowledge of symptomatology, exercise induced asthma and inhaled corticosteroids. The nurses within 5 years of experience had only 32% of knowledge on preventive drugs, and misconceptions. Nurses with more than 5 years of experience (67%) had misconceptions such as asthmatic children develop dependence on inhalers. The study results highlights that there is need to design well structured educational strategies for health professionals.

**Christina.S.(2010)** conducted a study to assess the effectiveness of structured video teaching programme on knowledge and practice regarding management and prevention of bronchial asthma among mothers of asthmatic children in Masonic Hospital Coimbatore. Research design used for the study was one group pretest post test design. Convenient sampling technique was used to select 60 samples. Data collection instrument consisted of demographic variables; self administered multiple choice questionnaires to assess the knowledge and 3 point rating scale to assess the practice regarding bronchial asthma. The collected data were tabulated, analyzed and interpreted by using

descriptive and inferential statistics. The result shows that out of 60 mothers 36(60 %) had inadequate knowledge, 22 (37%) of mothers had moderately adequate knowledge and only 2(3%) of mothers had adequate knowledge in the pre test. In the post test 37(62 %) of mothers had adequate knowledge, 23(38 %) had moderately adequate knowledge and none of them had inadequate knowledge. in the pre test 46.25% had general information about asthma and the mean score was 3.7. In the post test 70.8% had general information about asthma and the mean score was 5.66. The post test mean practice score 30.65 was higher than the pretest mean practice score 19.53 among the mothers of under five asthmatic children. The obtained 't' value 26.27 was significant at 0.05 level ( $p < 0.05$ ).

## **CHAPTER III**

### **METHODOLOGY**

#### **RESEARCH METHEDODOLOGY**

This chapter deals with the methodology adopted for the study. It includes research approach, research design, and setting, criteria for sample selection, sample and sampling technique, instrument, method of data collection and plan for data analysis.

#### **RESEARCH APPROACH**

Evaluative approach was used to assess the effectiveness of Strelnikova breathing exercise on respiratory signs and parameters among children with Lower respiratory tract infections (LRTI).

#### **RESEARCH DESIGN**

The research design selected for this study was quasi experimental non equivalent control group pre test and post test design.

#### **SCHEMATIC PRESENTATION**

<b>Group</b>	<b>Pre test</b>	<b>Intervention</b>	<b>Post test</b>
Experimental group	O1	X	O2
Control group	O1	-	O2

The symbols used are

O1- Pre test to assess the level of respiratory signs and parameters in experimental group and control group

X – The intervention (Strelnikova breathing exercise) in experimental group

O2- Post test to assess the level of respiratory signs and parameters in experimental group and control group

#### **SETTING FOR THE STUDY**

The study was conducted in Masonic hospital at Coimbatore. Masonic hospital is situated in Race course road, Coimbatore. It is a 100 bedded

Pediatric hospital with four floors. The hospital has well equipped pediatric intensive care unit, Monthly outpatient census around 3000-3500 children and Inpatient census around 700–800 children. Nearly 100 to130 children were admitted with lower respiratory tract infections per month. Around 75 to 80 children belong to the age group 6-15 years per month.

## **POPULATION**

The population selected for this study was children with lower respiratory tract infections (LRTI).

## **SAMPLE**

Sample consists of children who are diagnosed as wheezing associated lower respiratory tract infections, asthma and pneumonia within the age group of (6-15 years) admitted in pediatric ward.

## **CRITERIA FOR SAMPLE SELECTION**

### **Inclusion criteria**

- Children aged 6-15 years with lower respiratory tract infections who are admitted in the hospital for 5 days.
- Children, who can able to understand and speak Tamil.
- Children, who are able to do activity
- Children, who are willing to participate

### **Exclusion criteria**

- Children, who are very sick
- Children, with physical disabilities such as blindness, deaf, dumb and specialized children (MR).

## **SAMPLE SIZE**

Sample size composed of 60 children with lower respiratory tract infections. Among 60 samples, 30 were in experimental group and 30 were in control group.

## **SAMPLING TECHNIQUE**

The samples were selected by using purposive sampling technique. The first obtained 30 samples were allotted to experimental group and the next 30 samples were allotted to control group.

## **METHOD OF DATA COLLECTION**

### **DESCRIPTION OF THE TOOL**

Tool consists of four parts

#### **PART-I**

It deals with demographic variables such as age, sex, education, residence, religion, order of birth, family history of lower respiratory tract infections, pet animals in house, type of allergy, frequency of attack in last year and duration of illness.

#### **PART-II**

It consists of Severity and exacerbation grade scale to assess the respiratory signs. It includes respiratory rate, presence of wheezing and usage of accessory muscle.

#### **PART-III**

It consists of Peak flow zones namely green zone, high yellow zone, low yellow zone and red zone. It is used to measure the peak flow rate by using peak flow meter

#### **PART-IV**

It consists of oxygen saturation ratings to measure the oxygen level by using pulse oximeter.

## **SCORING PROCEDURE AND INTERPRETATION**

#### **PART-II**

It consists of Severity and exacerbation grade scale to assess the respiratory signs [adapted from IAP Respiratory chapter, (2003)]. It includes respiratory rate, wheezing present and accessory muscle usage. Based on this three the severity of exacerbation is given as 0,1,2,3 and 4. Total score for this scale is 10.

<b>Level of severity</b>	<b>Score</b>	<b>Percentage (%)</b>
Normal	0	0
Mild	1 to 3	1-33
Moderate	4 to 6	34-66
Severe	7 to 10	67-100

### PART-III

It consists of Peak flow zones namely green zone, high yellow zone, low yellow zone and red zone. It is used to measure peak flow rate by using peak flow meter. Score given as percentage. [Adapted from Martin Stern., (2003)]

Peak flow zone	Percentage (%)	Description
Green zone	90 to 100	Normal
High yellow zone	70 to 90	Mild
Low yellow zone	50 to 70	Moderate
Red zone	Less than 50	Severe

### PART-IV

It consists of oxygen saturation ratings to measure the oxygen level by using pulse oxy-meter. Score given as percentage. [Adapted from Susan Roberts., (2005)]

Oxygen saturation (%)	Description
98-100	Normal
96-97	Mild
91-95	Moderate
< 91	Abnormal

## **VALIDITY**

The validity of the tool was established in consultation with four experts in the field of pediatric nursing and one medical expert. No modifications were done in tool. The accuracy of the instrument was assessed by Karl Pearson's formula, for peak flow meter ( $r=0.85$ ) and for pulse oximeter ( $r=0.94$ ).

## **RELIABILITY**

The reliability of the tool was established by using inter rater method (Karl-pearson formula). The value was found to be reliable for Severity and exacerbation grade scale ( $r=0.88$ ). The reliability of the instrument was assessed by using inter rater method (Karl-pearson formula). The value was found to be reliable, for Peak flow rate ( $r=0.98$ ), and for oxygen saturation level ( $r=0.97$ ).

## **PILOT STUDY**

The pilot study was conducted in Masonic hospital at Coimbatore, for the period of 10 days. The researcher has obtained permission from the institution and from the participant prior to the study. The purpose of the study was explained to the subjects. The samples who fulfilled the inclusion criteria were selected. The purposive sampling technique was used to select 6 samples for experimental group and followed by 6 samples for control group. Demographic variables and pre test was conducted on the first day for both experimental and control group. In experimental group, the intervention of Strelnikova breathing exercise was taught to the child and made them to do the exercises daily for 30 minutes in the morning, afternoon and evening for 5 consecutive days. In control group, the existing hospital routine was practiced. On 5<sup>th</sup> day post test was done to assess respiratory signs measured by Severity and exacerbation grade scale and parameters measured by peak flow meter and oxy-meter in both experimental and control group.

The paired 't' value for experimental group, respiratory signs 5.44 (table value= 2.571), Peak flow rate 17.3 (table value= 2.571) and Oxygen saturation

5.68 (table value= 2.571) at  $P < 0.05$  level of significance. For control group, respiratory signs 6.17 (table value= 2.571), Peak flow rate 8.9 (table value= 2.571) and Oxygen saturation 4.76 (table value= 2.571) at  $P < 0.05$  level of significance. Pilot study revealed that in experimental group there is a significant reduction in respiratory signs and improvement in peak flow rate and oxygen saturation. Independent “t” test calculated value for respiratory signs, 3.38 (table value= 2.228), Peak flow rate 2.80 (table value= 2.228) and Oxygen saturation 1.2 (table value= 2.228) at  $P < 0.05$  level of significance revealed that there is a significant difference in respiratory signs, peak flow rate and oxygen saturation between experimental and control group. After the pilot study it was found that it is feasible and practicable to conduct the main study.

#### **DATA COLLECTION PROCEDURE**

Data collection was done in Masonic hospital at Coimbatore, for a period of 5 weeks. The investigator obtained written permission from the hospital management and oral consent was obtained from the samples prior to the study. The purpose of the study was explained to the subjects. The samples who fulfilled the inclusion criteria were selected. The purposive sampling technique was used to select 30 samples for experimental group and followed by 30 samples for control group. Everyday 3-4 samples were selected. Demographic variables and pre test was conducted on the first day for both experimental and control group. In experimental group, the intervention of Strelnikova breathing exercise was taught to the child and made them to do the exercises daily for 30 minutes in the morning, afternoon and evening for 5 consecutive days. Child was supervised by the investigator in every session. In control group, the existing hospital routine was practiced. On the 5<sup>th</sup> day post test was done to assess respiratory signs measured by Severity and exacerbation grade scale and parameters measured by peak flow meter and oxy-meter in both experimental and control group. The data were collected and analyzed by using descriptive and inferential statistics. The instructional module was distributed to the children to follow it at home.



## PLAN FOR DATA ANALYSIS

The collected data were analyzed by using descriptive and inferential statistics. The statistical methods were used are as follows,

S. No	Data analysis	Method	Objectives
1.	Descriptive statistics	Frequency, Percentage	To describe about demographic variables of children with lower respiratory tract infections
		Mean Standard deviation	To assess pre test and post test score of respiratory signs and parameters among children with lower respiratory tract infections in experimental group To assess pre test and post test score of respiratory signs and parameters among children with lower respiratory tract infections in control group
2.	Inferential statistics	Paired' test  Independent 't' test  Chi-square test	To compare pre test and post test score of respiratory signs in experimental group. To compare pre test and post test score of respiratory parameters in experimental group To compare pre test and post test score of respiratory signs in control group To compare pre test and post test score of respiratory parameters in control group To compare post test score of respiratory signs between experimental group and control group To compare post test score of respiratory parameters between experimental group and control group To find out association between post test scores of respiratory signs among children with their selected demographic variables in experimental group.

## PROTECTION OF HUMAN SUBJECTS

The proposed study was conducted after the approval of dissertation committee. Written permission was obtained from the administrator and medical superintendent of Masonic hospital, Coimbatore. Oral consent was obtained from each selected sample.

## **CHAPTER IV**

### **DATA ANALYSIS AND INTERPRETATION**

This chapter deals with the analysis and interpretations of the data to assess the effectiveness of strelnikova breathing exercises on respiratory signs and parameters among children with Lower respiratory tract infections (LRTI) in Masonic Hospital, Coimbatore.

Data were collected from 60 children with Lower respiratory tract infections, 30 children under experimental group and 30 children under control group. The data obtained were analyzed and presented under following headings.

#### **ORGANIZATION OF DATA**

The data has been tabulated and organized as follows,

- SECTION A : Distribution of demographic variables
- SECTION B : Assess the pre test and post test score of respiratory signs and parameters among children with Lower respiratory tract infections in experimental group
- SECTION C : Assess the pre test and post test score of respiratory signs and parameters among children with Lower respiratory tract infections in control group
- SECTION D : Compare the pre test and post test score of respiratory signs among children with Lower respiratory tract infections in experimental group
- SECTION E : Compare the pre test and post test score of respiratory parameters among children with Lower respiratory tract infections in experimental group
- SECTION F : Compare the pre test and post test score of respiratory signs among children with Lower respiratory tract infections in control group

- SECTION G : Compare the pre test and post test score of respiratory parameters among children with Lower respiratory tract infections in control group
- SECTION H : Compare the post test score of respiratory signs among children with Lower respiratory tract infections between experimental group and control group
- SECTION I : Compare the post test score of respiratory parameters among children with Lower respiratory tract infections between experimental group and control group
- SECTION J : Association between post test score on respiratory signs of children with Lower respiratory tract infections with their selected demographic variables in experimental group

**SECTION A: Distribution of demographic variables**

TABLE 1: Frequency and percentage distribution of demographic variables among children with LRTI in experimental group and control group

$n^1 = 30, n^2 = 30$

S. NO	DEMOGRAPHIC VARIABLES	EXPERIMENTAL GROUP		CONTROL GROUP	
		FREQ	%	FREQ	%
1.	<b>Age of child (in years)</b>				
a)	6 to 8 years	18	60	20	66.7
b)	9 to 12 years	10	33.3	9	30
c)	13 to 15 years	2	6.7	1	3.3
2.	<b>Sex</b>				
a)	Male	15	50	20	66.7
b)	Female	15	50	10	33.3
3	<b>Education ( in std)</b>				
a)	I to III	18	60	20	66.7
b)	IV to VII	10	33.3	9	30
c)	VIII to X	2	6.7	1	3.3
4.	<b>Residence</b>				
a)	Rural area	11	36.7	13	43.3
b)	Urban area	19	63.3	17	56.7
5.	<b>Religion</b>				
a)	Christian	3	10	4	13.3
b)	Hindu	27	90	26	86.7
c)	Muslim	-	-	-	-
d)	Others	-	-	-	-

6.	<b>Order of birth</b>				
a)	First child	22	73.4	22	73.4
b)	Second child	7	23.3	7	23.3
c)	Third child	1	3.3	1	3.3
d)	Fourth child and above	-	-	-	-
7.	<b>Family history of respiratory infection</b>				
a)	Yes	17	56.7	21	70
b)	No	13	43.3	9	30
8.	<b>Pet animals in home</b>				
a)	Yes	2	6.7	5	16.7
b)	No	28	93.3	25	83.3
9.	<b>Type of allergy</b>				
a)	Dust	20	66.7	21	70
b)	House mites	3	10	-	-
c)	Food	6	20	1	3.3
d)	No allergy	1	3.3	8	26.7
10.	<b>Frequency of attack in last year</b>				
a)	None	2	6.7	9	30
b)	One to three times	18	60	18	60
c)	Four to five times	8	26.6	2	6.7
d)	Above five times	2	6.7	1	3.3
11.	<b>Duration of illness</b>				
a)	0 to 1 year	7	23.3	5	16.7
b)	2 to 3 years	6	20	10	33.3
c)	4 to 5 years	6	20	11	36.7
d)	Above 5 years	11	36.7	4	13.3

Table 1: Revealed that the demographic variables among children with Lower respiratory tract infection in both experimental group and control group such as age, sex, education, residence, religion, order of birth, family history of lower respiratory tract infections, pet animals in house, type of allergy, frequency of attack in last year and duration of illness.

Regarding age, in experimental group, majority of children 18(60%) belongs to the age of 6-8 years, 10(33.3%) belongs to the age of 9-12 years and least 2(6.7%) belongs to age of 13-15 Years. In control group, majority of children 20(66.7%) belongs to the age of 6-8 years, 9(30%) belongs to the age of 9-12 years and least 1(3.3%) belongs to age of 13-15 Years. (fig: 2)

Regarding sex, in experimental group, 15(50%) children were male and 15(50%) were female. In control group, majority of the children 20(66.7%) were male and 10(33.3%) were female. (fig: 3)

With regard to education, in experimental group, majority of children 18(60%) belongs to I-III std, 10(33.3%) belongs to IV-VII std and least 2(6.7%) belongs to VIII-X std. In control group, majority of children 20(66.7%) belongs to I-III std, 9(30%) belongs to IV-VII std and least 1(3.3%) belongs to VIII-X std. (fig: 4)

Regarding residence, in experimental group, majority of the children 19(63.3%) were in urban area and least 11(36.7%) were in rural area. In control group, majority of the children 17(56.7%) were in urban area and least 13(43.3%) were in rural area.(fig: 5)

According to religion, in experimental group, majority of children 27(90%) were Hindus and least 3 (10%) were Christians. In control group, majority of children 26(86.7%) were Hindus and least 4 (13.3%) were Christians. (fig: 6)

Regarding order of birth, in experimental group, majority of children 22(73.4%) were first child, 7(23.3%) were second child and least 1(3.3%) was third child. In control group, majority of children were 22(73.4%) first child, 7(23.3%) were second child and least 1(3.3%) was third child. (fig: 7)

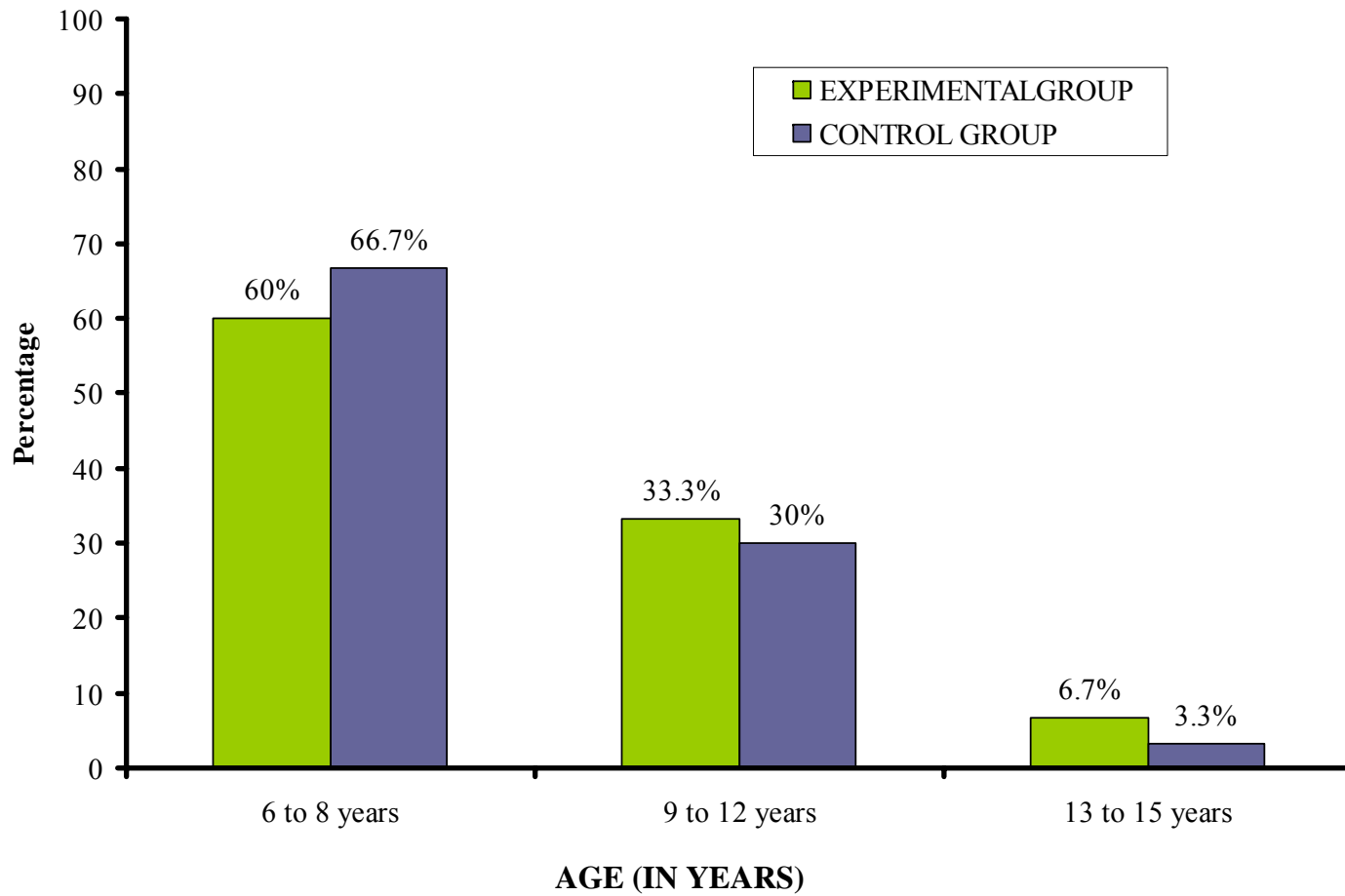
With regard to family history of respiratory infection, in experimental group, 17(56.7%) children had the history of infection and 13(43.3%) children had no history of infection. In control group, majority of the children 21(70%) had the history of infection and 9(30%) had no history of infection. (fig: 8)

Regarding pet animals in home, in experimental group, 28(93.3%) children had no pet animals in home and 2(6.7%) children had pet animals in home. In control group, majority of the children 25(83.3%) had no pet animals in home and least 5(16.7%) had pet animals in home. (fig: 9)

With regard to type of allergy, in experimental group, majority of children 20(66.7%) had dust allergy, 6(20%) had food allergy, 3(10%) had house mites allergy and least 1(3.3%) had no allergy. In control group, majority of children 21(70%) had dust allergy, 8(26.7%) had no allergy and least 1(3.3%) had food allergy. (fig: 10)

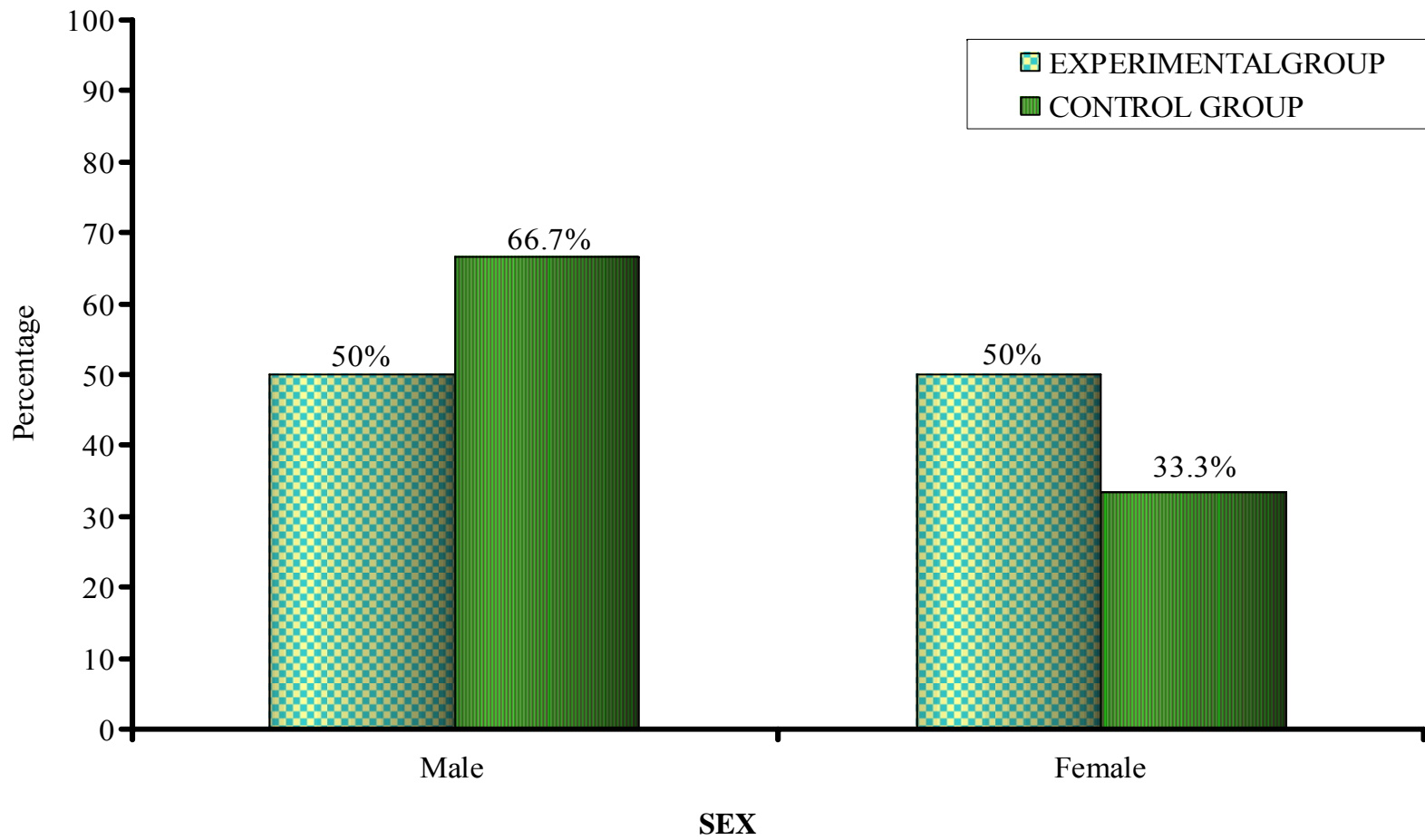
Regarding frequency of attack in last year, in experimental group, majority of children 18(60%) had 1-3 attacks, 8(26.6%) had 4-5 attacks, 2(6.7%) had above 5 attacks and least 2(6.7%) had no attack. In control group, majority of children 18(60%) had 1-3 attacks, 9(30%) had no attack, 2(6.7%) had 4-5 attacks and least 1(3.3%) had above 5 attacks. (fig: 11)

With regard to duration of illness, in experimental group, majority of children 11(36.7%) had above 5 years, 7(23.3%) had 0-1 year, 6(20%) had 2-3 years and least 6(20%) had 4-5 years. In control group, majority of children 11(36.7%) had 4-5 years, 10(33.3%) had 2-3 years, 5(16.7%) had 0-1 year and least 4(13.3%) had above 5 times. (fig: 12)

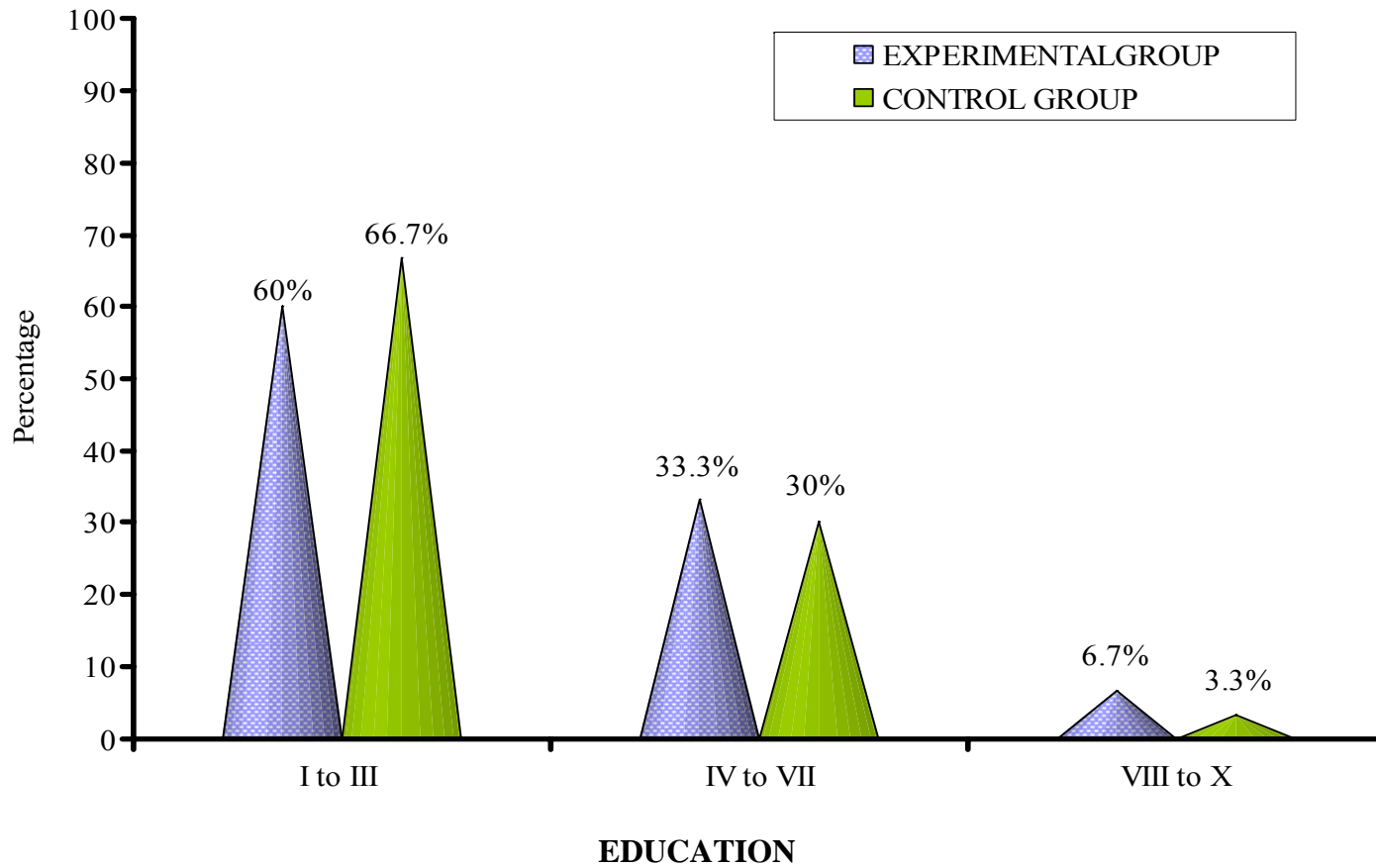


**Fig 2: Percentage distribution of children with LRTI according to their age in experimental and control group**

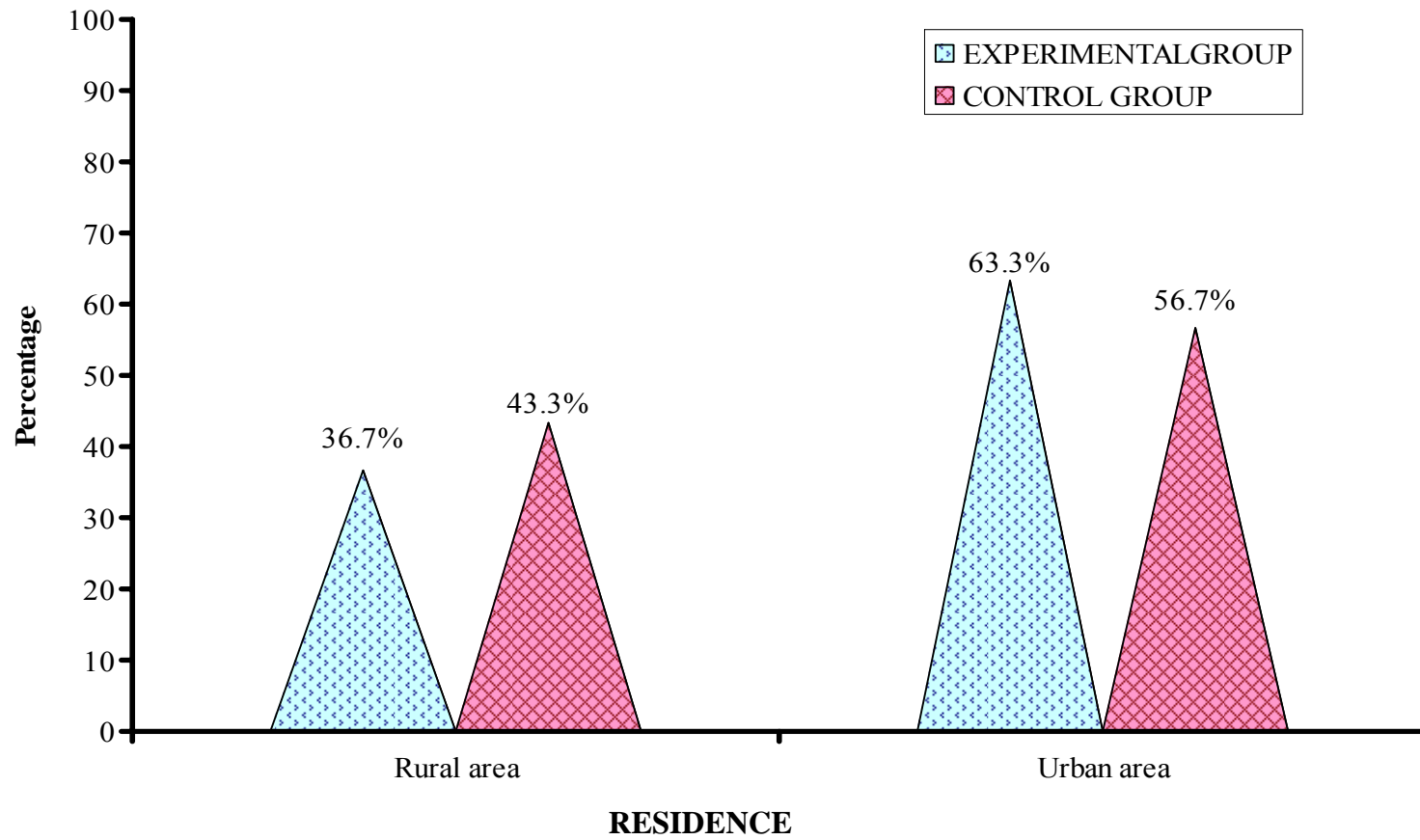




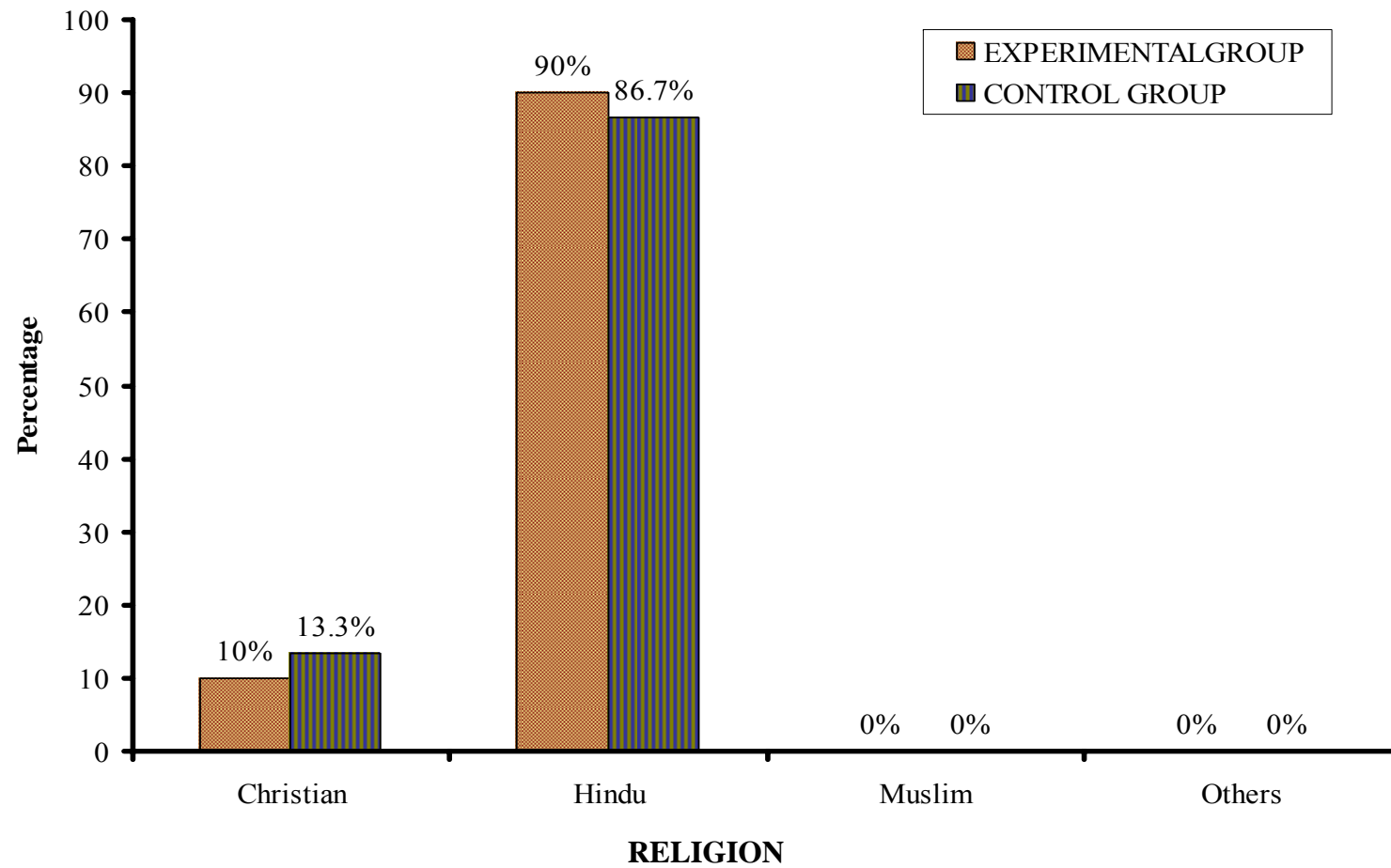
**Fig 3: Percentage distribution of children with LRTI according to their sex in experimental and control group**



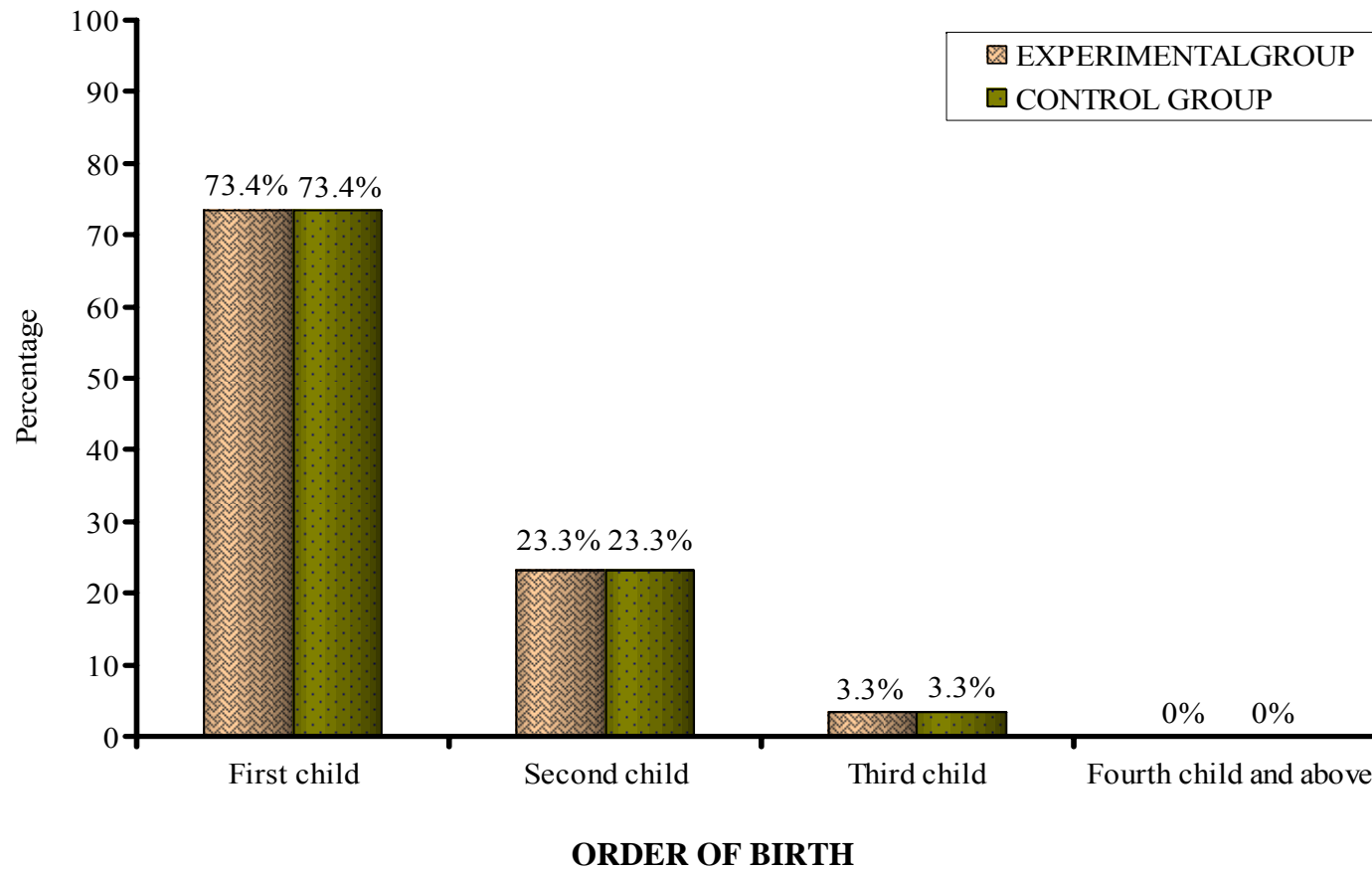
**FIG 4: Percentage distribution of children with lrti according to their education in experimental and control group**



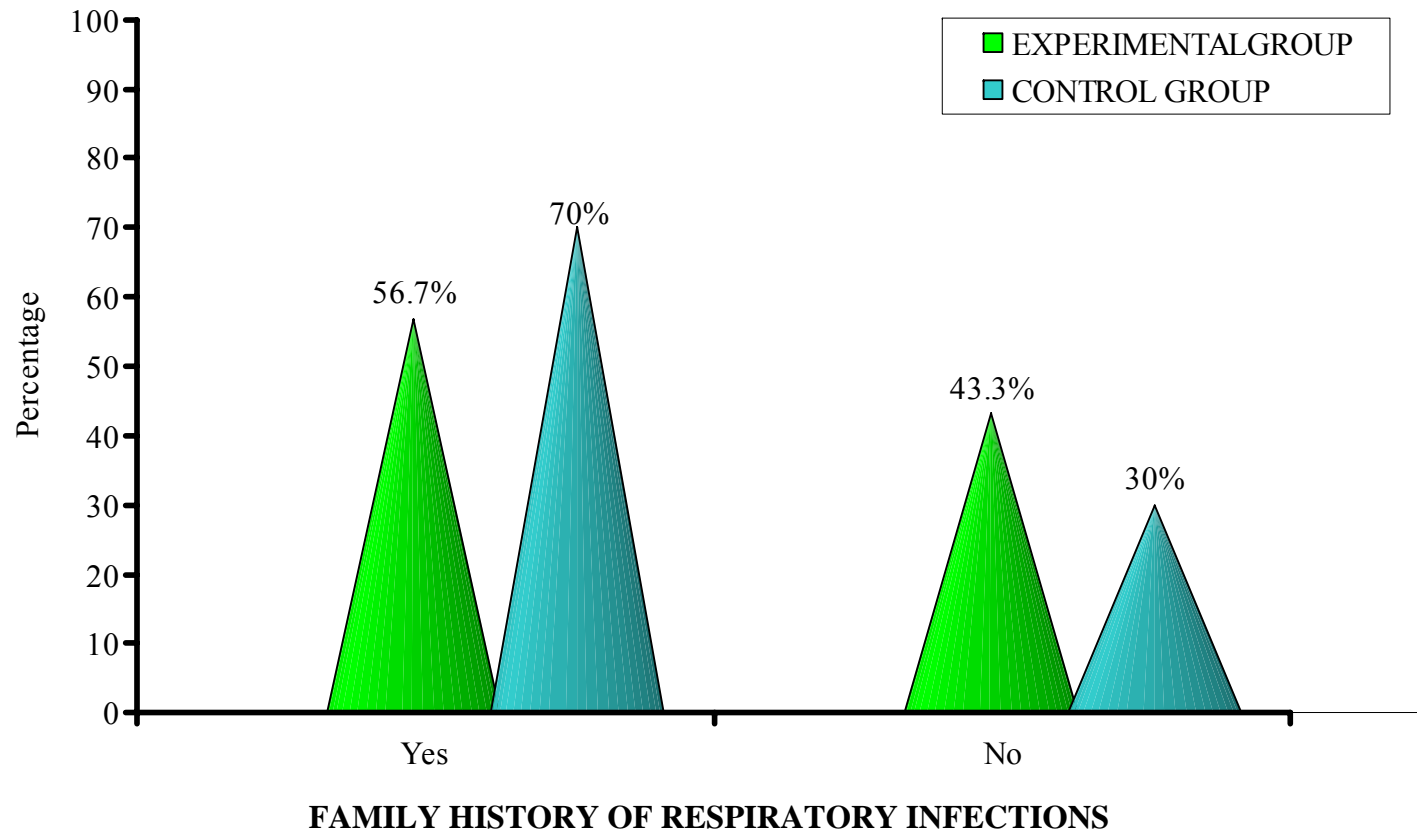
**Fig 5: Percentage distribution of children with LRTI according to their residence in experimental and control group**



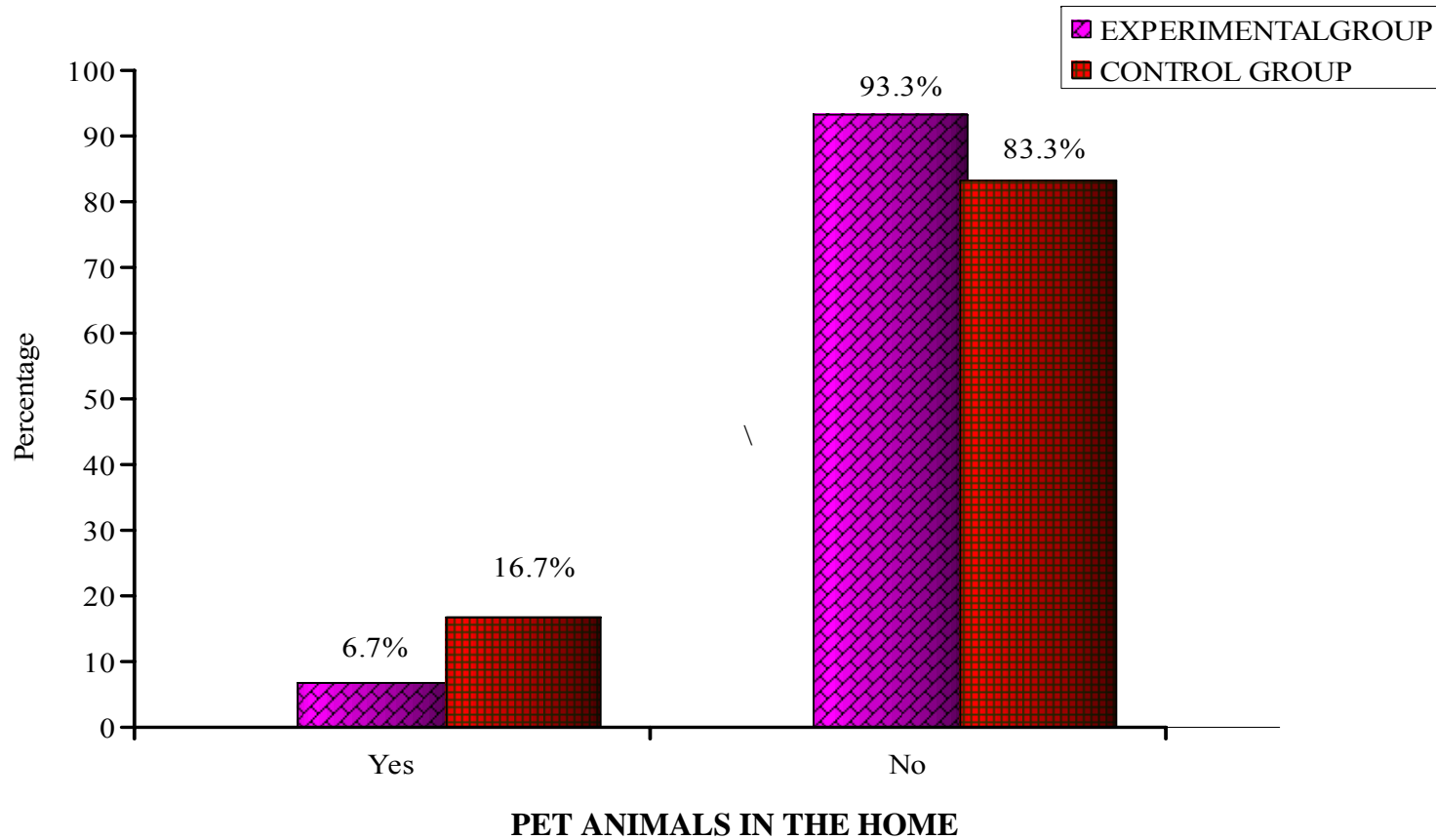
**Fig 6: Percentage distribution of children with LRTI according to their religion in experimental and control group**



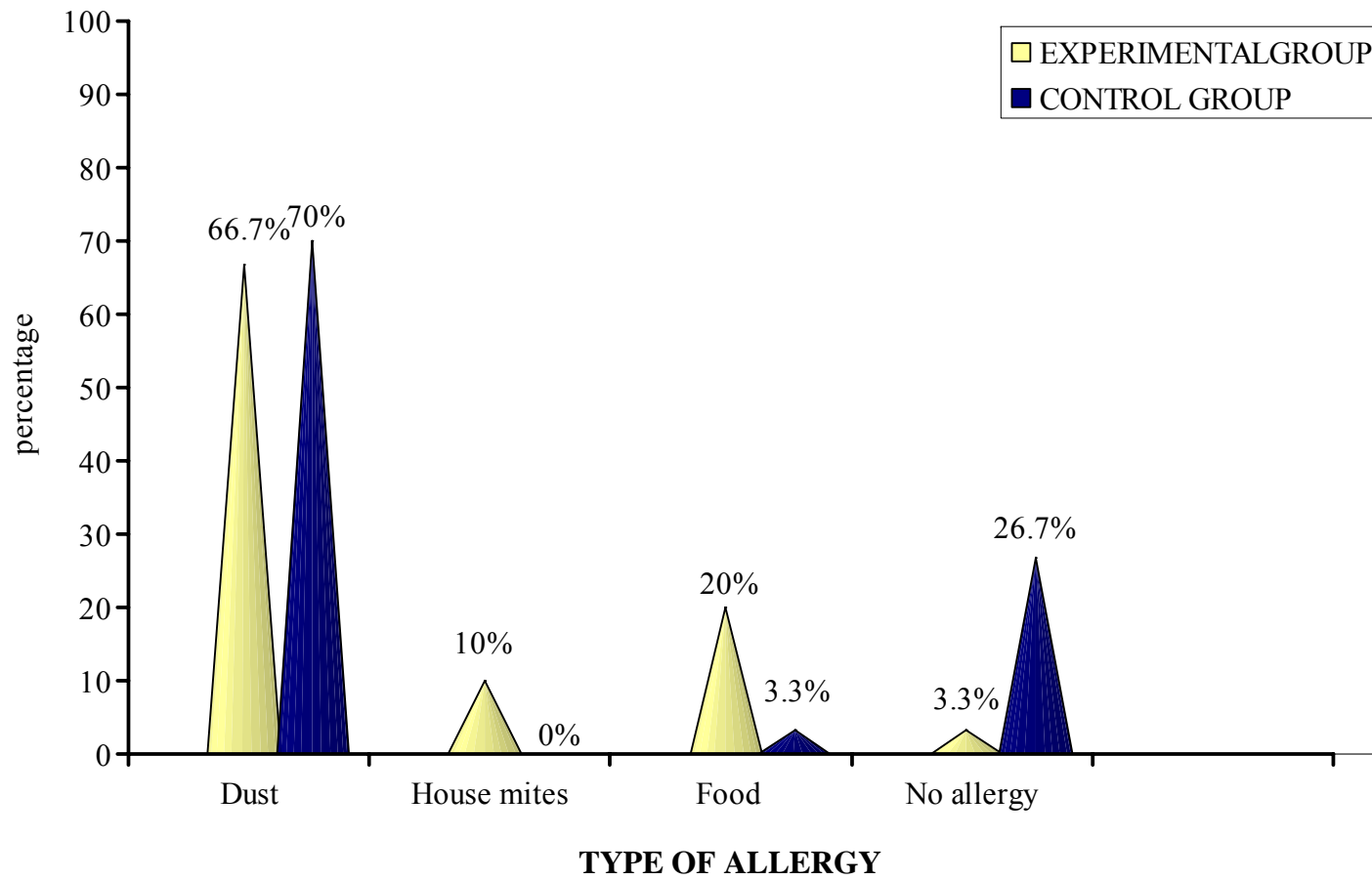
**Fig 7: Percentage distribution of children with LRTI according to their order of birth in experimental and control group**



**Fig 8: Percentage distribution of children with LRTI according to their family history of respiratory infections in experimental and control group**

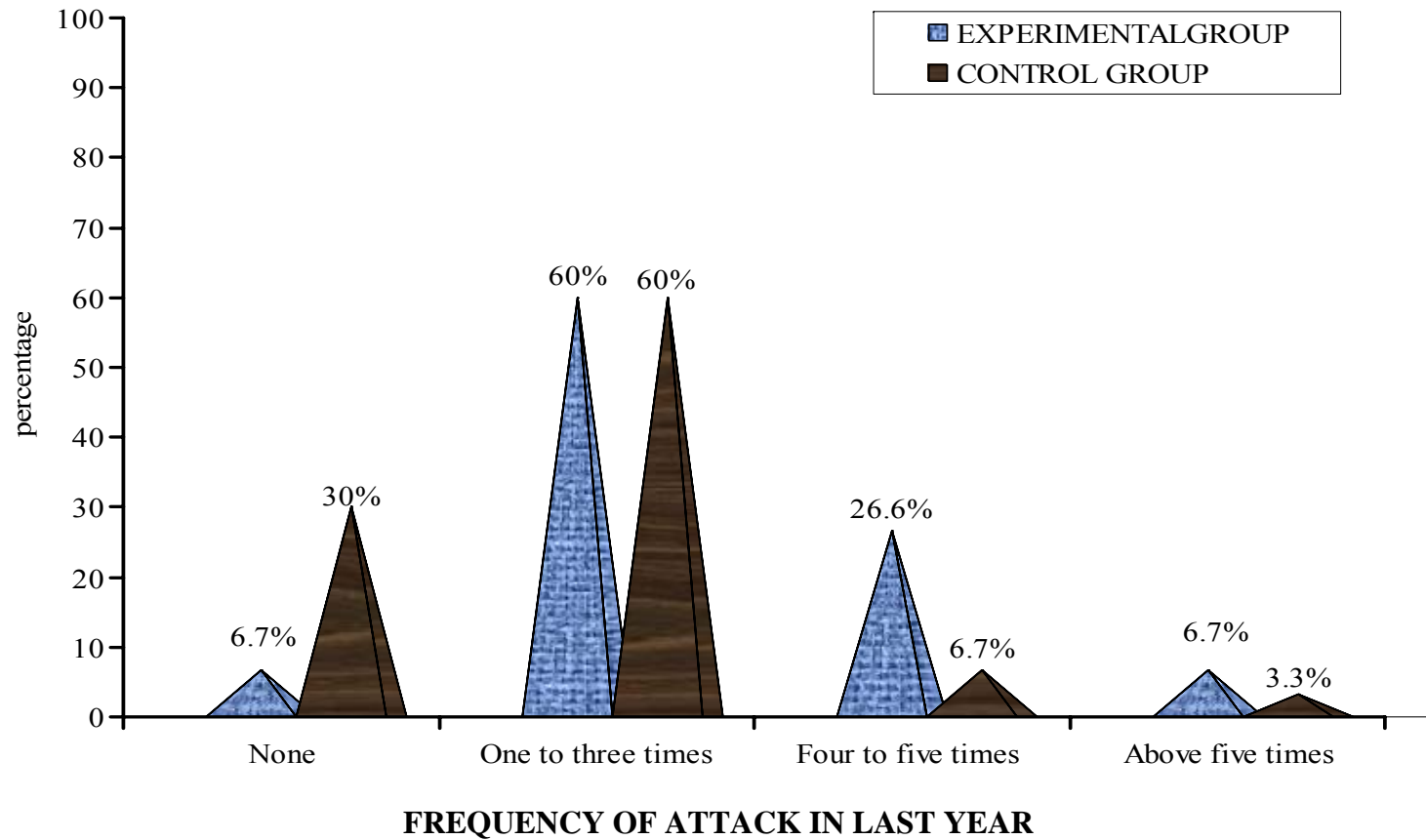


**Fig 9: Percentage distribution of children with LRTI according to pet animals in the home in experimental and control group**

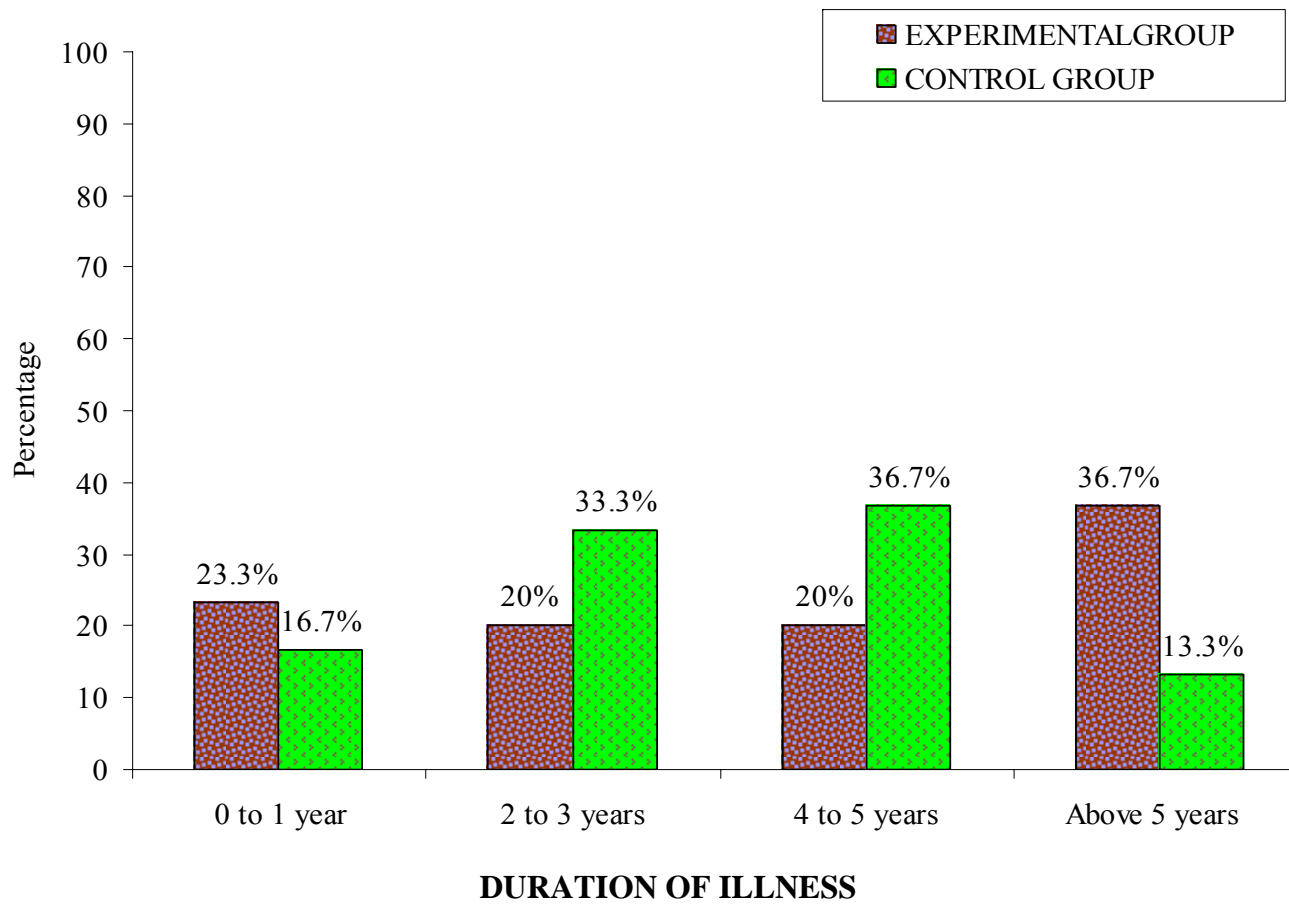


**Fig 10: Percentage distribution of children with LRTI according to their type of allergy in experimental and control group**





**Fig 11: Percentage distribution of children with LRTI according to frequency of attack in last year in experimental and control group.**



**Fig 12: Percentage distribution of children with LRTI according to duration of illness in experimental and control group**

**SECTION B: Assess the pre test and post test score of respiratory signs and parameters among children with Lower respiratory tract infections in experimental group**

**TABLE 2:** Frequency and percentage distribution of pre test and post test score of respiratory signs and parameters among children with LRTI in experimental group

n = 30

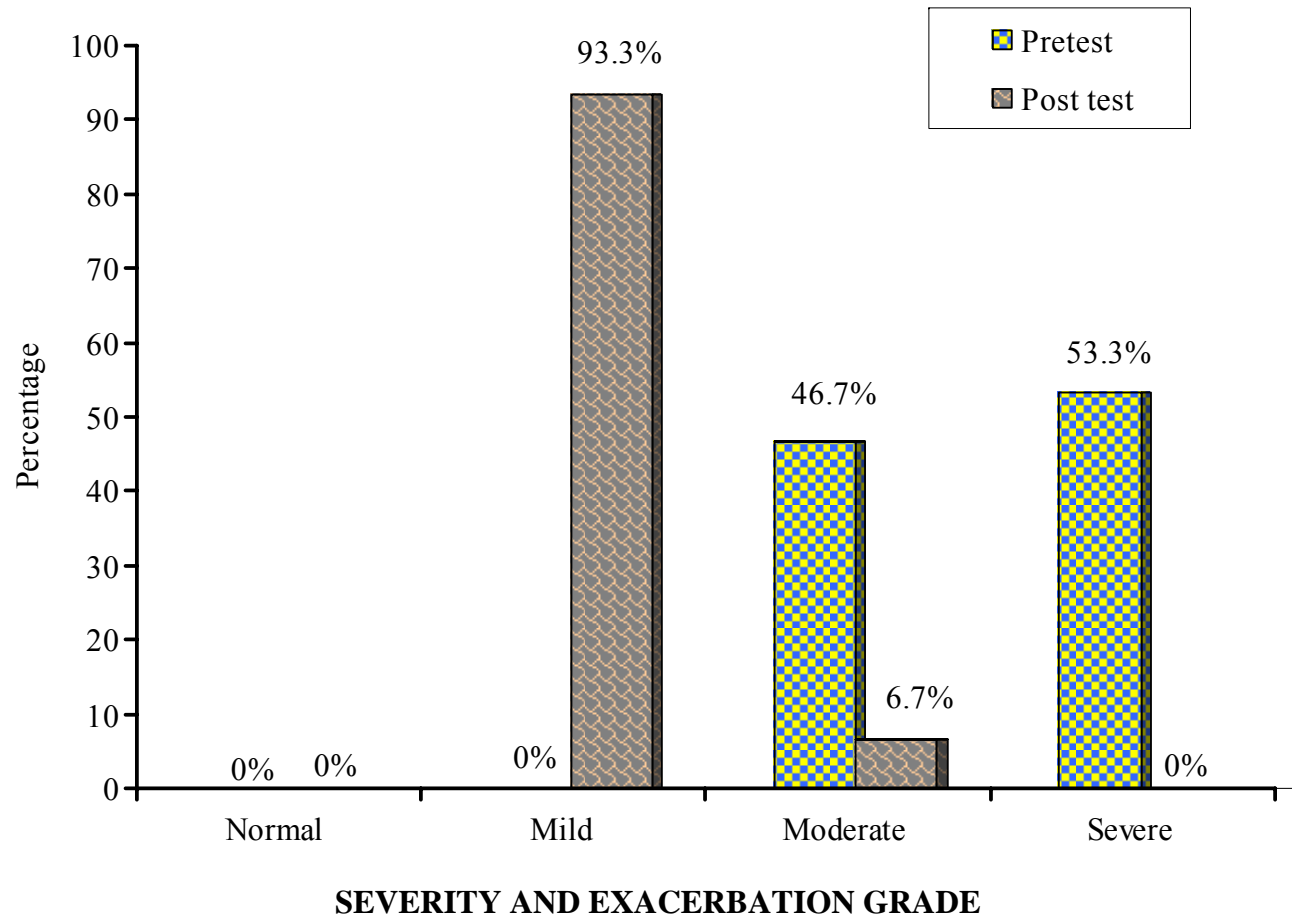
RESPIRATORY SIGNS AND PARAMETERS	PRE TEST		POST TEST	
	FREQ	%	FREQ	%
<b>Severity and exacerbation grade</b>				
Normal (0)	-	-	-	-
Mild (1-3)	-	-	28	93.3
Moderate (4-6)	14	46.7	2	6.7
Severe (7-10)	16	53.3	-	-
<b>Peak flow rate</b>				
Normal (90-100%)	-	-	-	-
Mild (70-90%)	-	-	12	40
Moderate (50-70%)	-	-	18	60
Severe (<50%)	30	100	-	-
<b>Oxygen saturation</b>				
Normal (98-100%)	-	-	21	70
Mild (96-97%)	8	26.7	9	30
Moderate (91-95%)	19	63.3	-	-
Abnormal (<91%)	3	10	-	-

Table 2: Depicts that,

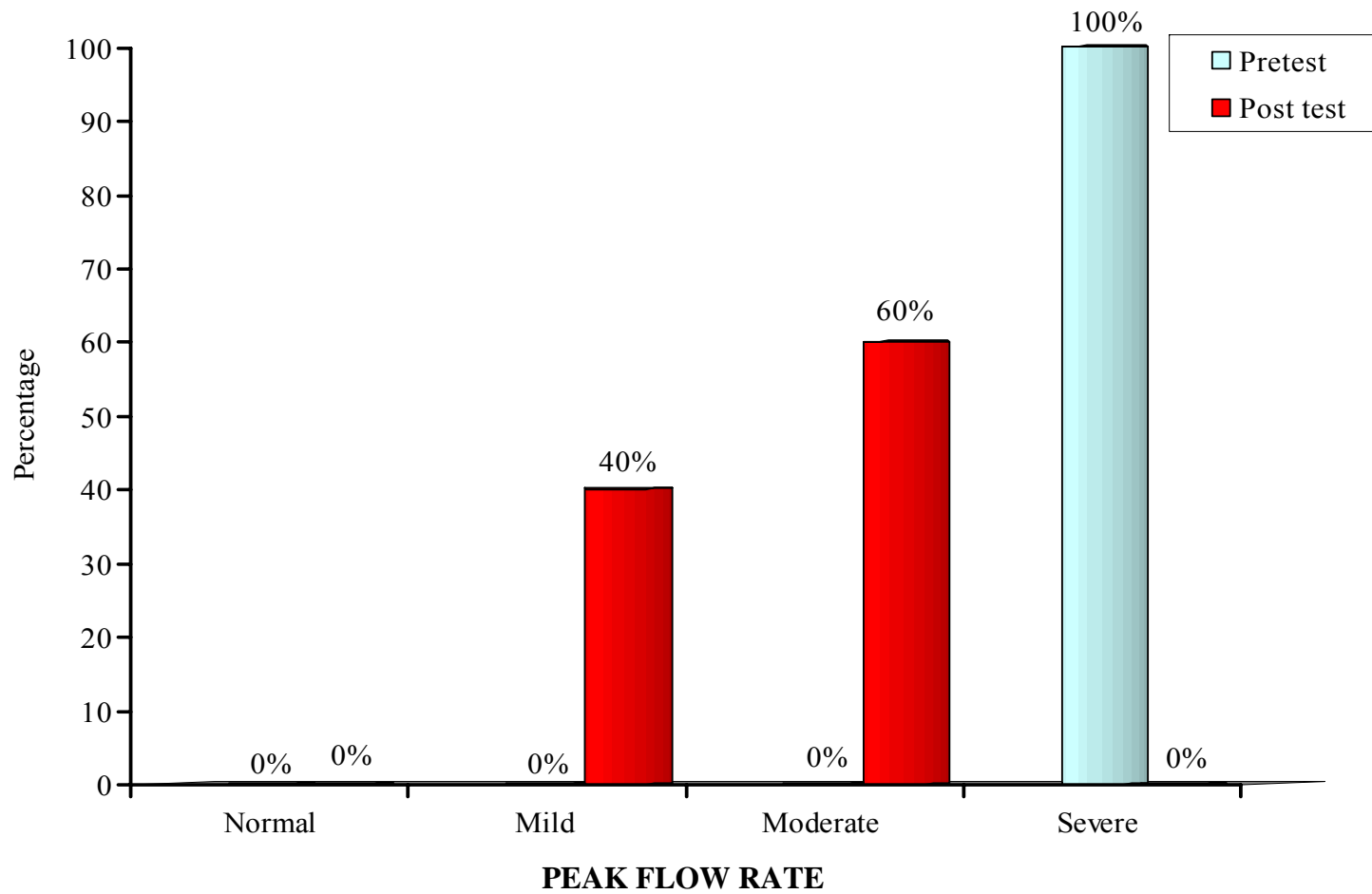
Severity and exacerbation grade, in pre test, 16(53.3%) children had severe grade and 14(46.7%) children had moderate grade. In post test, 28(93.3%) children had mild grade and 2(6.7%) children had moderate grade. (fig: 13)

Peak flow rate, in pre test, 30(100%) children had severe grade. In post test, 18(60%) children had moderate grade and 12(40%) children had mild grade. (fig: 14)

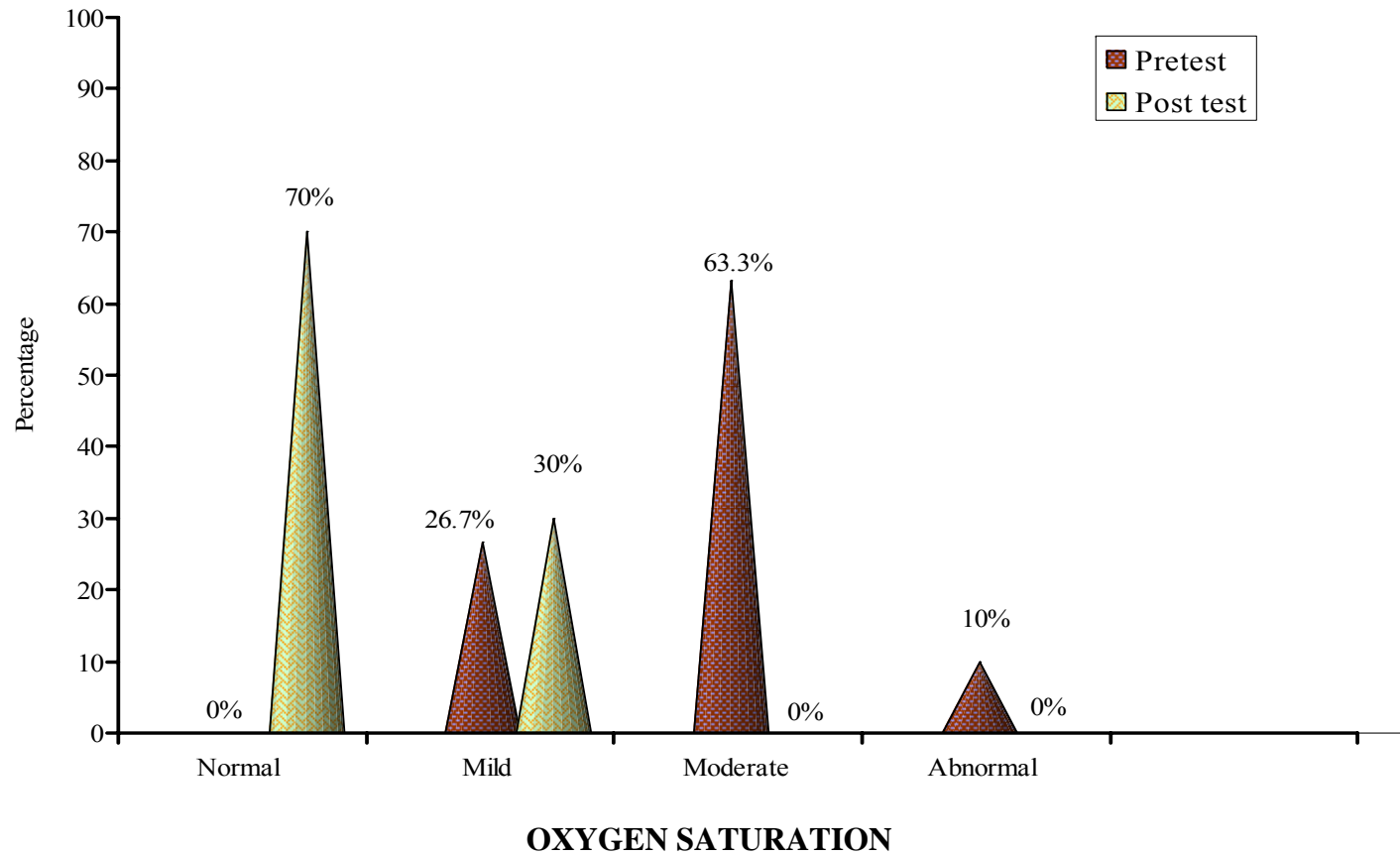
Oxygen saturation level, in pre test, 19(63.3%) children had moderate level, 8(26.7%) children had mild level and 3(10%) children had abnormal. In post test, 21(70%) children had normal and 9(30%) children had mild level. (fig: 15)



**Fig 13: Percentage distribution on severity and exacerbation grade of children with LRTI in experimental group**



**Fig 14: Percentage distribution on Peak flow rate of children with LRTI in experimental group**



**Fig 15: Percentage distribution on Oxygen saturation of children with LRTI in experimental group**

**SECTION C: Assess the pre test and post test score of respiratory signs and parameters among children with Lower respiratory tract infections in control group**

**TABLE 3:** Frequency and percentage distribution of pre test and post test score of respiratory signs and parameters among children with LRTI in control group

n= 30

<b>RESPIRATORY SIGNS AND PARAMETERS</b>	<b>PRE TEST</b>		<b>POST TEST</b>	
	<b>FREQ</b>	<b>%</b>	<b>FREQ</b>	<b>%</b>
<b>Severity and exacerbation grade</b>				
Normal (0)	-	-	-	-
Mild (1-3)	-	-	18	60
Moderate (4-6)	20	66.7	12	40
Severe (7-10)	10	33.3	-	-
<b>Peak flow rate</b>				
Normal (90-100%)	-	-	-	-
Mild (70-90%)	-	-	-	-
Moderate (50-70%)	-	-	12	40
Severe (<50%)	30	100	18	60
<b>Oxygen saturation</b>				
Normal (98-100%)	-	-	8	26.7
Mild (96-97%)	10	33.3	18	60
Moderate (91-95%)	18	60	4	13.3
Abnormal (<91%)	2	6.7	-	-

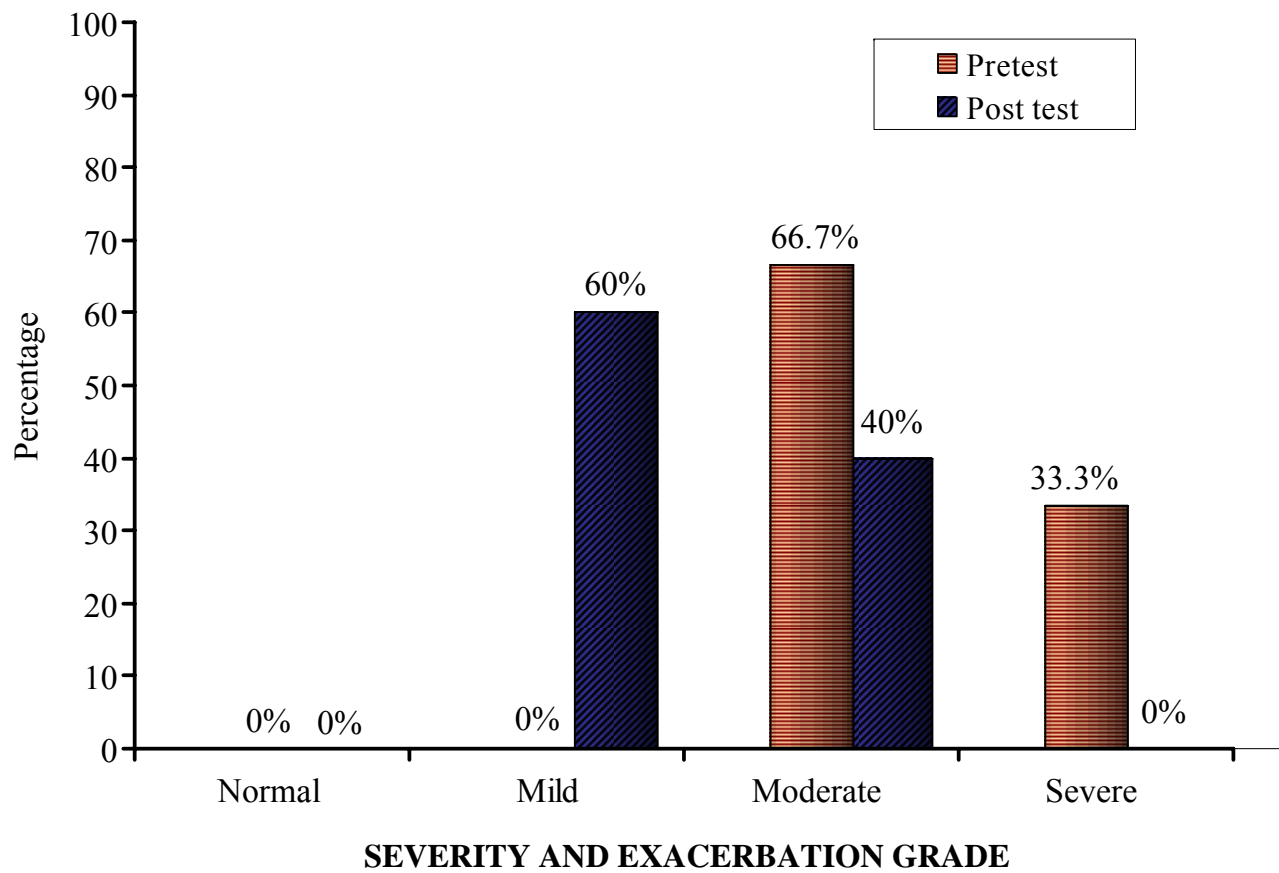
Table 3: Depicts that,

Severity and exacerbation grade, in pre test, 20(66.7%) children had moderate grade and 10(33.3%) children had severe grade. In post test, 18(60%) children had mild grade and 12(40%) children had moderate grade. (fig: 16)

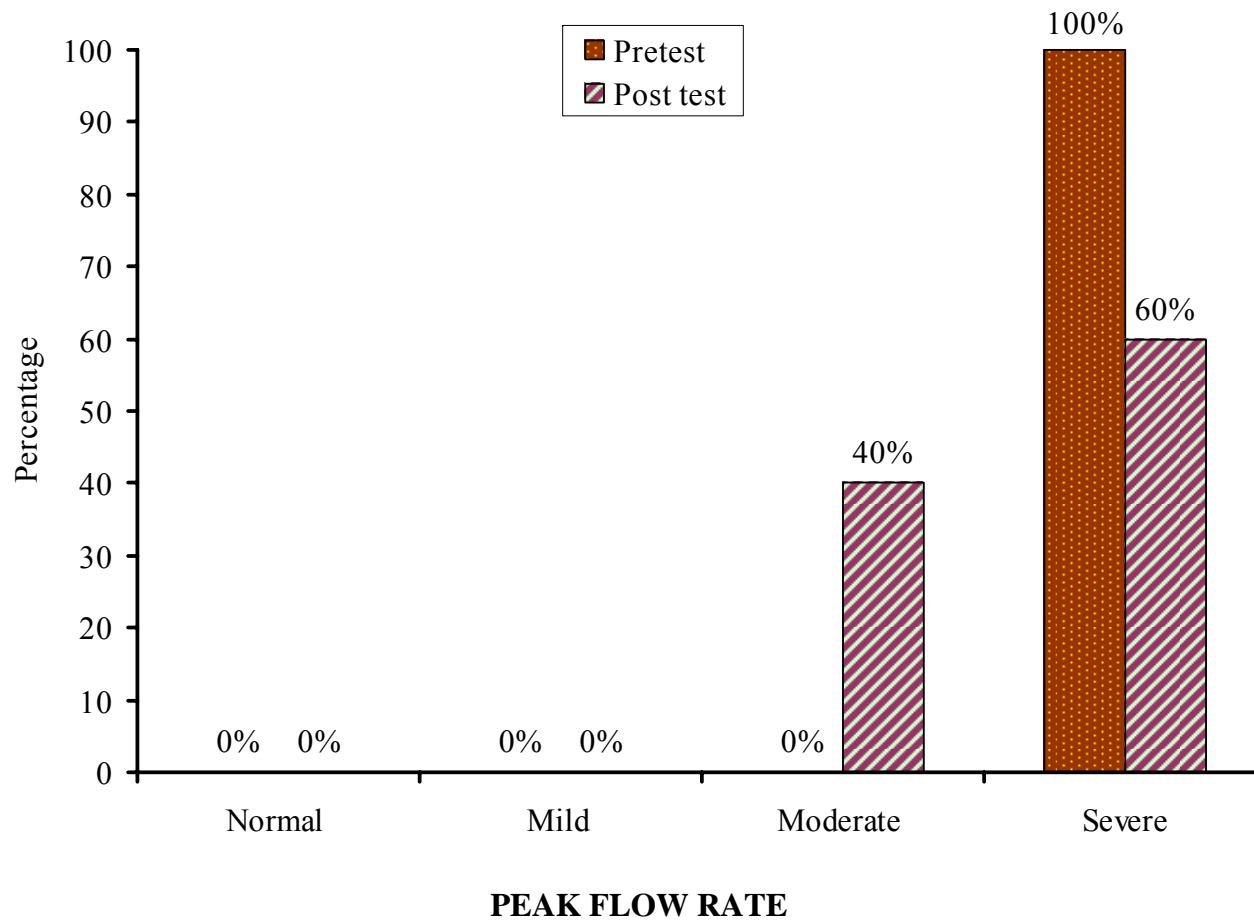


Peak flow rate, in pre test, 30(100%) children had severe grade. In post test, 18(60%) children had severe grade and 12(40%) children had moderate grade.(fig: 17)

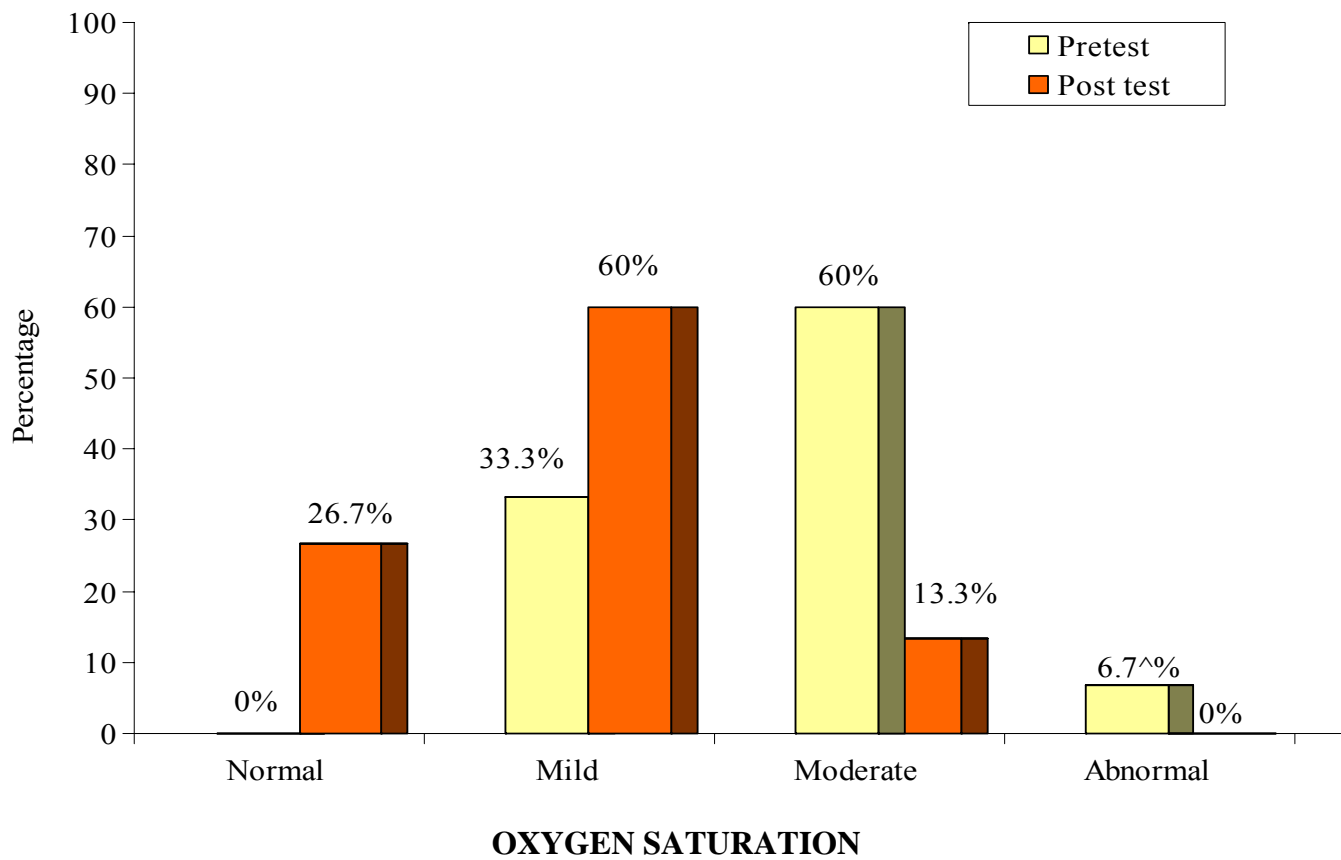
Oxygen saturation level, in pre test, 18(60%) children had moderate level, 10(33.3%) children had mild level and 2(6.7%) children had abnormal. In post test, 18(70%) children had mild level, 8(30%) children had normal and 4(30%) children had moderate level. (fig: 18)



**Fig 16: Percentage distribution on severity and exacerbation grade of children with LRTI in control group**



**Fig 17: Percentage distribution on Peak flow rate of children with LRTI in control group**



**Fig 18: Percentage distribution on Oxygen saturation of children with LRTI in control group**

**SECTION D: Compare the pre test and post test score of respiratory signs among children with Lower respiratory tract infections in experimental group**

TABLE 4: Comparison of Mean, standard deviation and paired ‘t’ value between pre test and post test score of respiratory signs among children with LRTI in experimental group

n= 30

Variable	Mean	SD	Mean difference	Paired ‘t’ value	Table value
Pre test	6	1.25	3.87	19.3	2.045
Post test	2.13	0.86			

d(f) 29

Significant \*

P<0.05

Table 4: depicts the mean score, Standard deviation and paired ‘t’ value in experimental group. The post test mean score 2.13 (SD±0.86) lower than the pre test mean score 6 (SD±1.25) and mean difference was (3.87). The paired ‘t’ value of respiratory signs was 19.3 (table value= 2.045) which is significant at P< 0.05 level. The finding revealed that there is a significant reduction in respiratory signs in post test in experimental group.

**SECTION E: Compare the pre test and post test score of respiratory parameters among children with Lower respiratory tract infections in experimental group**

TABLE 5: Comparison of Mean, standard deviation and paired ‘t’ value between pre test and post test score of Peak flow rate among children with LRTI in experimental group

n= 30

Variable	Mean	SD	Mean difference	Paired ‘t’ value	Table value
Pre test	38.63	4.08	29.97	38.96	2.045
Post test	68.6	5.14			

d(f) 29

Significant \*

P<0.05

Table 5: depicts the mean score, Standard deviation and paired ‘t’ value in experimental group. The post test mean score 68.6 (SD±5.14) higher than the pre test mean score 38.63 (SD±4.08) and mean difference was (29.97). The paired ‘t’ value of Peak flow rate was 38.96 (table value= 2.045) which is significant at P< 0.05 level. The finding revealed that there is a significant improvement in Peak flow rate in post test in experimental group.

TABLE 6: Comparison of Mean, standard deviation and paired ‘t’ value between pre test and post test score of oxygen saturation among children with LRTI in experimental group

n= 30

<b>Variable</b>	<b>Mean</b>	<b>SD</b>	<b>Mean difference</b>	<b>Paired ‘t’ value</b>	<b>Table value</b>
Pre test	93.6	2.15	5.3	17.5	2.045
Post test	98.3	1.35			
d(f) 29		Significant *		P<0.05	

Table 6: depicts the mean score, Standard deviation and paired ‘t’ value in experimental group. The post test mean score 98.3 (SD±1.35) higher than the pre test mean score 93.6 (SD±2.15) and mean difference was (5.3). The paired ‘t’ value of oxygen saturation level was 17.5 (table value= 2.045) which is significant at P< 0.05 level. The finding revealed that there is a significant improvement in oxygen saturation level in post test in experimental group.

**SECTION F: Compare the pre test and post test score of respiratory signs among children with Lower respiratory tract infections in control group**

TABLE 7: Comparison of Mean, standard deviation and paired ‘t’ value between pre test and post test score of respiratory signs among children with LRTI in control group

n= 30

<b>Variable</b>	<b>Mean</b>	<b>SD</b>	<b>Mean difference</b>	<b>Paired ‘t’ value</b>	<b>Table value</b>
Pre test	5.53	1.27	2.17	15.21	2.045
Post test	3.36	1			

d(f) 29

Significant \*

P<0.05

Table 7: depicts the mean score, Standard deviation and paired ‘t’ value in control group. The post test mean score 3.36 (SD±1) lower than the pre test mean score 5.53 (SD±1.27) and mean difference was (2.17). The paired ‘t’ value of respiratory signs was 15.21 (table value= 2.045) which is significant at P< 0.05 level. The finding revealed that there is a significant reduction in respiratory signs in post test in control group.



**SECTION G: Compare the pre test and post test score of respiratory parameters among children with Lower respiratory tract infections in control group**

TABLE 8: Comparison of Mean, standard deviation and paired ‘t’ value between pre test and post test score of peak flow rate among children with LRTI in control group

n= 30

Variable	Mean	SD	Mean difference	Paired ‘t’ value	Table value
re test	35.73	4.24	11.87	18.15	2.045
Post test	47.6	5.2			
d(f) 29		Significant *		P<0.05	

Table 8: depicts the mean score, Standard deviation and paired ‘T’ value in Control group. The post test mean score 47.6 (SD±5.2) higher than the pre test mean score 35.73 (SD±4.24) and mean difference was (11.87). The paired‘t’ value of Peak flow rate was 18.15 (table value= 2.045) which is significant at P< 0.05 level. The finding revealed that there is a significant improvement in Peak flow rate in post test in control group.

TABLE 9: Comparison of Mean, standard deviation and paired ‘t’ value between pre test and post test score of oxygen saturation among children with LRTI in control group

n= 30

Variable	Mean	SD	Mean difference	Paired ‘t’ value	Table value
Pre test	94.5	1.89	1.9	12.29	2.045
Post test	96.4	1.59			

d(f) 29

Significant \*

P<0.05

Table 9: depicts the mean score, Standard deviation and paired ‘t’ value in Control group. The post test mean score 96.4 (SD±1.59) higher than the pre test mean score 94.5 (SD±1.89) and mean difference was (1.9). The paired ‘t’ value of oxygen saturation level was 12.29 (table value= 2.045) which is significant at P< 0.05 level. The finding revealed that there is a significant improvement in oxygen saturation level in post test in control group.

**SECTION H: Compare the post test score of respiratory signs among children with Lower respiratory tract infections between experimental group and control group**

TABLE 10: Comparison of Mean, standard deviation and independent ‘t’ value of post test score of respiratory signs among children with LRTI between experimental group and control group

$n^1 = 30, n^2 = 30$

Group	Mean	SD	Mean difference	Independent ‘t’ value	Table value
Experimental group	2.13	0.8	1.23	5.2	2.0017
Control group	3.36	1			

d(f) 58

Significant \*

$P < 0.05$

Table 10: depicts the mean post test score of respiratory signs in the experimental group 2.13 (SD±0.86) was significantly lower than the mean post test scored of respiratory signs in control group 3.36 (SD±1) and the mean difference was (1.23). Independent ‘t’ value 5.2 (table value= 2.0017) which is significant at  $P < 0.05$  level. The finding revealed that there is a significant reduction in respiratory signs between experimental group and control group, which showed that Strelnikova breathing exercises is effective for children with Lower respiratory tract infections.

**SECTION I: Compare the post test score of respiratory parameters among children with Lower respiratory tract infections between experimental group and control group**

TABLE 11: Comparison of Mean, standard deviation and independent ‘t’ value of post test score of Peak flow rate among children with LRTI between experimental group and control group

$n^1 = 30, n^2 = 30$

Group	Mean	SD	Mean difference	Independent ‘t’ value	Table value
Experimental group	68.6	5.14	21	16	2.0017
Control group	47.6	5.2			

d(f) 58

Significant \*

P<0.05

Table 11: depicts the mean post test score of peak flow rate in the experimental group 68.6 (SD±5.14) was significantly higher than the mean post test scored of peak flow rate in control group 47.6 (SD±5.2) and the mean difference was (21). Independent ‘t’ value 16 (table value= 2.0017) which is significant at P< 0.05 level. The finding revealed that there is a significant improvement in peak flow rate between experimental group and control group, which showed that Strelnikova breathing exercises is effective for children with Lower respiratory tract infections.

TABLE 12: Comparison of Mean, standard deviation and independent ‘t’ value of post test score of oxygen saturation among children with LRTI between experimental group and control group

$n^1 = 30, n^2 = 30$

<b>Group</b>	<b>Mean</b>	<b>SD</b>	<b>Mean difference</b>	<b>Independent ‘t’ value</b>	<b>Table value</b>
Experimental group	98.3	1.35	1.9	5.27	2.0017
Control group	96.4	1.59			

d(f) 58

Significant \*

P<0.05

Table 12: depicts the mean post test score of oxygen saturation level in the experimental group 98.3 (SD±1.35) was significantly higher than the mean post test scored of oxygen saturation level in control group 96.4 (SD±1.59) and the mean difference was (1.9). Independent ‘t’ value 5.27 (table value= 2.0017) which is significant at P< 0.05 level. The finding revealed that there is a significant improvement in oxygen saturation level between experimental group and control group, which showed that Strelnikova breathing exercises is effective for children with Lower respiratory tract infections.

**SECTION J: Association between post test score on respiratory signs of children with Lower respiratory tract infections with their selected demographic variables in experimental group**

Table 13: Association between post test score on respiratory signs among children with LRTI with their selected demographic variables in experimental group

n= 30

S. no	Demographic variables	Respiratory signs				$\chi^2$	Table value	LOS
		Mild		Moderate				
		F	%	F	%			
1.	<b>Age of child (in years)</b>							
a)	6 to 8 years	17	56.7	1	3.3	0.232	5.99 d(f)=2	NS
b)	9 to 12 years	9	30	1	3.3			
c)	13 to 15 years	2	6.7	-	-			
2.	<b>Sex</b>							
a)	Male	14	46.7	1	3.3	0	3.84 d(f)=1	NS
b)	Female	14	46.7	1	3.3			
3.	<b>Education (in std)</b>							
a)	I-III	17	56.7	1	3.3	2.582	5.99 d(f)=2	NS
b)	IV-VII	9	30	1	3.3			
c)	VIII-X	2	6.7	-	-			
4.	<b>Residence</b>							
a)	Rural area	10	33.4	1	3.3	0.202	3.84 d(f)=1	NS
b)	Urban area	18	60	1	3.3			

5.	<b>Religion</b>							
a)	Christian	3	10	-	-			
b)	Hindu	25	83.3	2	6.7	1.633	3.84	NS
c)	Muslim	-	-	-	-		d(f)=1	
d)	Others	-	-	-	-			
6.	<b>Order of birth</b>							
a)	First child	20	66.7	2	6.7			
b)	Second child	7	23.3	-	-	0.237	5.99	NS
c)	Third child	1	3.3	-	-		d(f)=2	
d)	Fourth child and above	-	-	-	-			
7.	<b>Family history of respiratory infections</b>							
a)	Yes	15	50	2	6.7	0.509	3.84	NS
b)	No	13	43.3	-	-		d(f)=1	
8.	<b>Pet animals in home</b>							
a)	Yes	2	6.7	-	-		3.84	S
b)	No	26	86.6	2	6.7	3.88	d(f)=1	
9.	<b>Type of allergy</b>							
a)	Dust	19	63.4	1	3.3			
b)	House mites	3	10	-	-	9.432	7.82	S
c)	Food	6	20	-	-		d(f)=3	
d)	No allergy	-	-	1	3.3			
10.	<b>Frequency of attack in last year</b>							
a)	None	2	6.7	-	-			

b)	1 to 3 times	17	57.6	1	3.3		7.82	NS
c)	4 to 5 times	7	23.4	1	3.3	0.519	d(f)=3	
d)	Above 5 times	2	6.7	-	-			
11.	<b>Duration of illness</b>							
a)	0 to 1 year	7	23.3	-	-			
b)	2 to 3 years	5	16.7	1	3.3	0.957	7.82	NS
c)	4 to 5 years	5	16.7	1	3.3		d(f)=3	
d)	Above 5 years	11	36.7	-	-			

NS-Non significant

S- Significant

(P < 0.05)

Table 13: Depicts that, Chi-square was calculated to find out the association between the respiratory signs with their selected demographic variables in experimental group. Significant association was found between respiratory signs in relation to pet animals' in house ( $\chi^2 = 3.88$ ) and type of allergy ( $\chi^2 = 9.432$ ) at (P < 0.05) level. No significant association in respiratory signs were found when compared to age, sex, education, residence, religion, order of birth, family history of lower respiratory tract infections, frequency of attack in last year and duration of illness.



## **CHAPTER – V**

### **DISCUSSION**

The discussion chapter deals with sample characteristics and objectives of the study. The aim of this present study was to evaluate the effectiveness of Strelnikova breathing exercises on respiratory signs and parameters among children with Lower respiratory tract infections (LRTI) in Masonic Hospital, Coimbatore.

#### **DESCRIPTION OF DEMOGRAPHIC VARIABLES**

Regarding age, in experimental group, majority of children 18(60%) belongs to the age of 6-8 years, 10(33.3%) belongs to the age of 9-12 years and least 2(6.7%) belongs to age of 13-15 Years. In control group, majority of children 20(66.7%) belongs to the age of 6-8 years, 9(30%) belongs to the age of 9-12 years and least 1(3.3%) belongs to age of 13-15 Years.

Regarding sex, in experimental group, 15(50%) children were male and 15(50%) were female. In control group, majority of the children 20(66.7%) were male and 10(33.3%) were female.

With regard to education, in experimental group, majority of children 18(60%) belongs to I-III std, 10(33.3%) belongs to IV-VII std and least 2(6.7%) belongs to VIII-X std. In control group, majority of children 20(66.7%) belongs to I-III std, 9(30%) belongs to IV-VII std and least 1(3.3%) belongs to VIII-X std.

Regarding residence, in experimental group, majority of the children 19(63.3%) were in urban area and least 11(36.7%) were in rural area. In control group, majority of the children 17(56.7%) were in urban area and least 13(43.3%) were in rural area.

According to religion, in experimental group, majority of children 27(90%) were Hindus and least 3 (10%) were Christians. In control group, majority of children 26(86.7%) were Hindus and least 4 (13.3%) were Christians.

Regarding order of birth, in experimental group, majority of children 22(73.4%) were first child, 7(23.3%) were second child and least 1(3.3%) was third child. In control group, majority of children were 22(73.4%) first child, 7(23.3%) were second child and least 1(3.3%) was third child.

With regard to family history of respiratory infection, in experimental group, 17(56.7%) children had the history of infection and 13(43.3%) children had no history of infection. In control group, majority of the children 21(70%) had the history of infection and 9(30%) had no history of infection.

Regarding pet animals in home, in experimental group, 28(93.3%) children had no pet animals in home and 2(6.7%) children had pet animals in home. In control group, majority of the children 25(83.3%) had no pet animals in home and least 5(16.7%) had pet animals in home.

With regard to type of allergy, in experimental group, majority of children 20(66.7%) had dust allergy, 6(20%) had food allergy, 3(10%) had house mites allergy and least 1(3.3%) had no allergy. In control group, majority of children 21(70%) had dust allergy, 8(26.7%) had no allergy and least 1(3.3%) had food allergy.

Regarding frequency of attack in last year, in experimental group, majority of children 18(60%) had 1-3 attacks, 8(26.6%) had 4-5 attacks, 2(6.7%) had above 5 attacks and least 2(6.7%) had no attack. In control group, majority of children 18(60%) had 1-3 attacks, 9(30%) had no attack, 2(6.7%) had 4-5 attacks and least 1(3.3%) had above 5 attacks.

With regard to duration of illness, in experimental group, majority of children 11(36.7%) had above 5 years, 7(23.3%) had 0-1 year, 6(20%) had 2-3 years and least 6(20%) had 4-5 years. In control group, majority of children 11(36.7%) had 4-5 years, 10(33.3%) had 2-3 years, 5(16.7%) had 0-1 year and least 4(13.3%) had above 5 times.

**THE FINDINGS OF THE STUDY WERE DISCUSSED ACCORDING TO THE OBJECTIVES AS FOLLOWS**

1. Assess the pre test and post test score of respiratory signs and parameters among children with Lower respiratory tract infections in experimental group
2. Assess the pre test and post test score of respiratory signs and parameters among children with Lower respiratory tract infections in control group
3. Compare the pre test and post test score of respiratory signs among children with Lower respiratory tract infections in experimental group
4. Compare the pre test and post test score of respiratory parameters among children with Lower respiratory tract infections in experimental group
5. Compare the pre test and post test score of respiratory signs among children with Lower respiratory tract infections in control group
6. Compare the pre test and post test score of respiratory parameters among children with Lower respiratory tract infections in control group
7. Compare the post test score of respiratory signs between experimental group and control group among children with Lower respiratory tract infections
8. Compare the post test score of respiratory parameters between experimental group and control group among children with Lower respiratory tract infections
9. Association between post test score on respiratory signs of children with Lower respiratory tract infections in experimental group with their selected demographic variables.

**OBJECTIVE 1: Assess the pre test and post test score of respiratory signs and parameters among children with Lower respiratory tract infections in experimental group**

Severity and exacerbation grade, in pre test, 16(53.3%) children had severe grade and 14(46.7%) children had moderate grade. In post test, 28(93.3%) children had mild grade and 2(6.7%) children had moderate grade.

Peak flow rate, in pre test, 30(100%) children had severe grade. In post test, 18(60%) children had moderate grade and 12(40%) children had mild grade.

Oxygen saturation level, in pre test, 19(63.3%) children had moderate level, 8(26.7%) children had mild level and 3(10%) children had abnormal. In post test, 21(70%) children had normal and 9(30%) children had mild level.

The study findings were consistent with the findings of **Gozal., (1999)** conducted a study on long-term effects on strength and load perception of Respiratory muscle training in spinomuscular atrophy. Training in spinomuscular disorder patients was associated with improvements in experimental group than the pre test score. Similarly, RLP significantly decreased during the RMT period in trained group (mean delta: 1.9 +/- 0.3;  $P < 0.01$ ) but did not change in non trained group (-0.2 +/- 0.2).

**OBJECTIVE 2: Assess the pre test and post test score of respiratory signs and parameters among children with Lower respiratory tract infections in control group**

Severity and exacerbation grade, in pre test, 20(66.7%) children had moderate grade and 10(33.3%) children had severe grade. In post test, 18(60%) children had mild grade and 12(40%) children had moderate grade.

Peak flow rate, in pre test, 30(100%) children had severe grade. In post test, 18(60%) children had severe grade and 12(40%) children had moderate grade.

Oxygen saturation level, in pre test, 18(60%) children had moderate level, 10(33.3%) children had mild level and 2 (6.7%) children had abnormal. In post test, 18(70%) children had mild level, 8(30%) children had normal and 4(30%) children had moderate level.

The study findings were consistent with the findings of **Niedziocza., (2001)** conducted a study to evaluate the effect of breathing exercises on individuals with asthma. Of 489 Participants, one group did Buteyko breathing exercise and other group did not. Over a three-month period, bronchodilator use for the exercisers decreased by 90%, inhaled steroid use decreased by 49%, asthmatic symptoms decreased by 71% and quality of life improved by 54%. This compared with the non-exercisers whose bronchodilator use increased by 9% and inhaled steroid use did not change.

**OBJECTIVE 3: Compare the pre test and post test score of respiratory signs among children with Lower respiratory tract infections in experimental group**

Severity and exacerbation of respiratory signs depicts that, the post test mean score 2.13 (SD±0.86) lower than the pre test mean score 6 (SD±1.25) and mean difference was (3.87). The paired 't' value of respiratory signs was 19.3 (table value= 2.045) which is significant at  $P < 0.05$  level. The finding revealed that there is a significant reduction in respiratory signs in post test in experimental group.

The study findings were consistent with the findings of **Hiller, (1992)** conducted a study among 30 children aged 6-15 years was assessed for Asthma by using asthma severity scale. In pretest severity grade (less than 91 %) was obtained in majority (18) patients kappa  $W = 0.34$ . After the blowing exercise, in post test 97% had sensitivity of moderate grade where kappa  $W=0.55$ .

Hence the hypothesis  $H_1$ : The mean post test scores of respiratory signs is significantly lower than the mean pre test scores among children with Lower respiratory tract infections in experimental group, was accepted.

**OBJECTIVE 4: Compare the pre test and post test score of respiratory parameters among children with Lower respiratory tract infections in experimental group**

Peak flow rate depicts that, the post test mean score 68.6 (SD±5.14) higher than the pre test mean score 38.63 (SD±4.08) and mean difference was (29.97). The paired 't' value of Peak flow rate was 38.96 (table value= 2.045) which is significant at  $P < 0.05$  level. The finding revealed that there is a significant improvement in Peak flow rate in post test in experimental group.

Oxygen saturation depicts that, the post test mean score 98.3 (SD±1.35) higher than the pre test mean score 93.6 (SD±2.15) and mean difference was (5.3). The paired 't' value of oxygen saturation level was 17.5 (table value= 2.045) which is significant at  $P < 0.05$  level. The finding revealed that there is a significant improvement in oxygen saturation level in post test in experimental group.

The study findings were consistent with the findings of, **Schetimin., (2005)** the comparison of pre and post assessment spirometry shows, the pre test FVC is 89 and FEV is 81. After giving strelinikova breathing exercises the post test score result reveals FVC is 100 and FEV is 95. Hence there is reduction of cough and nasal breathing.

The study findings were consistent with the findings of **Bianchi.et.al., (2011)** conducted a study to evaluate the effects of a respiratory exercise program tailored for children with asthma. The patients participated in 1-hour sessions that took place twice a week in the morning. Considerable improvement in quality of life and significant difference was observed in the percentage of days when the patients recorded coughing ( $p = 0.02$ ), shortness of breath ( $p = 0.03$ ), night waking due to shortness of breath, and the use of bronchodilating agents ( $p = 0.04$ ). After 16 weeks, significant increases in maximum inspiratory pressure and maximum expiratory pressure (27.6% and 20.54%, respectively) were demonstrated.

The study findings were consistent with the findings of **Gary.c.et.al., (2009)** conducted a study to assess the effectiveness of bronchodilator therapy an improvement of acute asthma. 135 children (1-15 years) were selected with mild/moderate ( $\text{SaO}_2 > 91\%$ ) and severe ( $\text{SaO}_2 \leq 91\%$ ) asthma.  $\text{SaO}_2$  was inversely related to initial  $\text{SaO}_2$  ( $p < 0.01$ ) with the greatest rise (7%) occurring in children with the lowest initial level (84%).  $\text{SaO}_2$  increased more in the severe group than the mild to moderate group 2.3% versus 0.6% respectively ( $p < 0.01$ ) although the change in peak expiratory flow (PEF) was similar for both groups.

Hence the hypothesis  $H_2$ : The mean post test scores of respiratory parameters is significantly higher than the mean pre test scores among children with Lower respiratory tract infections in experimental group was accepted

**OBJECTIVE 5: Compare the pre test and post test score of respiratory signs among children with Lower respiratory tract infections in control group**

Severity and exacerbation of respiratory sign depicts that, the post test mean score 3.36 ( $SD \pm 1$ ) lower than the pre test mean score 5.53 ( $SD \pm 1.27$ ) and mean difference was (2.17). The paired 't' value of respiratory signs was 15.21 (table value= 2.045) which is significant at  $P < 0.05$  level. The finding revealed that there is a significant reduction in respiratory signs in post test in control group.

**OBJECTIVE 6: Compare the pre test and post test score of respiratory parameters among children with Lower respiratory tract infections in control group**

Peak flow rate depicts that, the post test mean score 47.6 ( $SD \pm 5.2$ ) higher than the pre test mean score 35.73 ( $SD \pm 4.24$ ) and mean difference was (11.87). The paired 't' value of Peak flow rate was 18.15 (table value= 2.045) which is significant at  $P < 0.05$  level. The finding revealed that there is a significant improvement in Peak flow rate in post test in control group.

Oxygen saturation depicts that, the post test mean score 96.4 (SD±1.59) higher than the pre test mean score 94.5 (SD±1.89) and mean difference was (1.9). The paired 't' value of oxygen saturation level was 12.29 (table value= 2.045) which is significant at P< 0.05 level. The finding revealed that there is a significant improvement in oxygen saturation level in post test in control group.

**OBJECTIVE 7: Compare the post test score of respiratory signs among children with Lower respiratory tract infections between experimental group and control group**

Among both group, the mean post test score of respiratory signs in the experimental group 2.13 (SD±0.86) was significantly lower than the mean post test scored of respiratory signs in control group 3.36 (SD±1) and the mean difference was (1.23). Independent 't' value 5.2 (table value= 2.0017) which is significant at P< 0.05 level. The finding revealed that there is a significant reduction in respiratory signs between experimental group and control group, which showed that Strelnikova breathing exercises is effective for children with Lower respiratory tract infections.

The study findings were consistent with the findings of **Pneumol.P.**, (2008) Among 50 samples, 25 patients received inspiratory muscle training. In pre test the maximum expiratory pressure was (48.32+/-5.706) and peak expiratory flow (173.6+/-50.817) at P >0.05. After intervention the post values of MEP was 109.9+/-18.041 and PEF value were 312+/- 54.848 at P< 0.0001. There is increased significance of respiratory parameters in inspiratory muscle training than the control group.

Hence the hypothesis H<sub>3</sub>: The mean post test scores of respiratory sign in experimental group is significantly lower than the mean post test scores among children with Lower respiratory tract infections in control group was accepted.



**OBJECTIVE 8: Compare the post test score of respiratory parameters among children with Lower respiratory tract infections between experimental group and control group**

Among both group, the mean post test score of peak flow rate in the experimental group 68.6 (SD±5.14) was significantly higher than the mean post test scored of peak flow rate in control group 47.6 (SD±5.2) and the mean difference was (21). Independent 't' value 16 (table value= 2.0017) which is significant at P< 0.05 level. The finding revealed that there is a significant improvement in peak flow rate between experimental group and control group, which showed that Strelnikova breathing exercises is effective for children with Lower respiratory tract infections.

Among both group, the mean post test score of oxygen saturation level in the experimental group 98.3 (SD±1.35) was significantly higher than the mean post test scored of oxygen saturation level in control group 96.4 (SD±1.59) and the mean difference was (1.9). Independent 't' value 5.27 (table value= 2.0017) which is significant at P< 0.05 level. The finding revealed that there is a significant improvement in oxygen saturation level between experimental group and control group, which showed that Strelnikova breathing exercises is effective for children with Lower respiratory tract infections.

The study findings were consistent with the findings of **Lindmark., (2002)** conducted a study to investigate the effects of deep-breathing exercises on pulmonary function after surgery. Patients performing deep-breathing exercises (n = 48) were compared to a control group (n = 42) who performed no breathing exercises postoperatively. Post test was done by spirometric measurements. Compared to the control subjects, the patients in the deep-breathing group had a significantly smaller reduction in FVC (to  $71 \pm 12\%$ , vs  $64 \pm 13\%$  of the preoperative values;  $p = 0.01$ ) and FEV<sub>1</sub> (to  $71 \pm 11\%$ , vs  $65 \pm 13\%$  of the preoperative values;  $p = 0.01$ ). Children in experimental group had

better pulmonary function on the fourth postoperative day compared to a control group performing no exercises.

The study findings were consistent with the findings of **Peter. N.,** (2009) 135 children aged (1-14.5 years) received deep breathing exercises. The assessment of SaO<sub>2</sub> (>91%) is mild/moderate, (<91%) is severe at P<0.01. In post test SaO<sub>2</sub> is inversely related to initial SaO<sub>2</sub>. SaO<sub>2</sub> increased more in severe group than the mild to moderate group (2.3% Vs 0.6%) at P<0.01. Peak flow rate also has significant increase in value after intervention.

Hence the hypothesis H<sub>4</sub> : The mean post test scores of respiratory parameters in experimental group is significantly higher than the mean post test scores among children with Lower respiratory tract infections in control group was accepted.

**OBJECTIVE 9: Association between post test score on respiratory signs of children with Lower respiratory tract infections with their selected demographic variables in experimental group.**

The study findings shows that, there was significant association was found between respiratory signs in relation to pet animals' in house ( $\chi^2=3.88$ ) and type of allergy ( $\chi^2=9.432$ ) at (P < 0.05) level. No significant association in respiratory signs were found when compared to age, sex, education, residence, religion, order of birth, family history of lower respiratory tract infections, frequency of attack in last year and duration of illness at (P < 0.05) level in significance.

The study findings were consistent with the findings of, by **Bharmance.,** (2010), study result is that there is a significant association between sensitization of infection with the age of the child and the allergens.

The study findings were consistent with the findings of **S. K. Kabra et.al** conducted a study on risk factors associated with bronchial asthma in school going children of rural Haryana. Passive smoking, inadequate

ventilation and pets (dogs and cats) at home are significant risk factors associated with presence of symptoms of asthma in rural children.

Hence the hypothesis H<sub>5</sub>: There will be a significant association between post test scores of respiratory signs in experimental group with their selected demographic variables among children with Lower respiratory tract infections, was rejected except for pet animals' in house ( $\chi^2=3.88$ ) and type of allergy ( $\chi^2=9.432$ ).

**CHAPTER – VI**  
**SUMMARY, CONCLUSION, IMPLICATION**  
**RECOMMENDATIONS AND LIMITATIONS**

**This chapter deals with**

- Summary of the study
- Conclusion
- Implication of nursing
- Recommendations
- Limitations

**SUMMARY OF THE STUDY**

The study was done to evaluate the effectiveness of Strelnikova breathing exercises on respiratory signs and parameters among children with Lower respiratory tract infections (LRTI).

The research design used for this study was quasi experimental non equivalent control group pre test and post test design. The research approach used for the study was evaluative approach which was conducted in Masonic hospital at Coimbatore. Conceptual frame work adopted in the present study was Modified Pender's Health Promotion Model (Revised 2002).The sample size was 60 children with LRTI, 30 for experimental group and 30 for control group.

The investigator gave brief introduction to the child and their mother who met inclusion criteria and were selected by using purposive sampling within the age of 6 to 15 years. Demographic variables were collected and Pre test was done for both experimental and control group by using Severity and exacerbation grade, peak flow rate and oxygen saturation level. Then the intervention of Strelnikova breathing exercise was taught to child and to do exercises daily for 30 minutes in the morning, afternoon and evening for 5 days in experimental group. Child was supervised by the investigator every session. In control group the existing hospital routine was practiced. Post test was

assessed on fifth day by using Severity and exacerbation grade, peak flow meter and oxy-meter for both experimental and control groups. The instructional module was distributed to the children to follow it at home.

The data was analyzed and tabulated using descriptive and inferential statistics. The effectiveness of strelinikova breathing exercises was assessed by frequency, percentage, paired 't' test, independent 't' test and chi-square test was used to find out the association between respiratory signs and parameters with their selected demographic variables among children with Lower respiratory tract infections in experimental group.

### **The major findings are summarized as follows**

#### **Distribution of demographic characteristics of the children with Lower respiratory tract infections**

- In experimental group, majority 18(60%) children belong to the age of 6-8 years and in control group, majority 20(66.7%) children belong to the age of 6-8 years.
- In experimental group, equal percentage 15(50%) children were male and female and in control group, majority 20(66.7%) children were male.
- In experimental group, majority 18(60%) children belongs to I-III std and in control group, majority 20(66.7%) children belongs to I-III std
- In experimental group, majority 19(63.3%) children belongs to urban area and in control group, majority 17(56.7%) children belongs to urban area.
- In experimental group, highest percentage 27(90%) children were Hindu and in control group, highest percentage 26(86.7%) children were Hindu
- In experimental group, 22(73.4%) children were first child and in control group, 22(73.4%) children were first child.

- In experimental group, majority 17(56.7%) children had the family history of respiratory infection and in control group; majority 21(70%) children had the family history of respiratory infection.
- In experimental group, highest percentage 28(93.3%) children had no pet animals in the home and in control group; highest percentage 25(83.3%) children had no pet animals in the home.
- In experimental group, majority 20(66.7%) children had dust allergy and in control group, majority 21(70%) children had dust allergy.
- In experimental group, majority 18(60%) children had 1-3 attacks within a year and in control group, majority 18(60%) children had 1-3 attacks within a year.
- In experimental group, 11(36.7%) children had the duration of illness above 5 years and in control group, 11(36.7%) children had the duration of illness between 4-5 years.

In Experimental group, the pre test Severity and exacerbation grade was 16(53.3%) children had severe grade and 14(46.7%) children had moderate grade. In post test, 28(93.3%) children had mild grade and 2(6.7%) children had moderate grade. In Control group, the pre test Severity and exacerbation grade was 20(66.7%) children had moderate grade and 10(33.3%) children had severe grade. In post test, 18(60%) children had mild grade and 12(40%) children had moderate grade.

In Experimental group, the pre test Peak flow zone grade was 30(100%) children had severe grade. In post test, 18(60%) children had moderate grade and 12(40%) children had mild grade. In Control group, the pre test Peak flow zone grade was 30(100%) children had severe grade. In post test, 18(60%) children had severe grade and 12(40%) children had moderate grade.

In Experimental group, the pre test Oxygen saturation level was 19(63.3%) children had moderate level, 8(26.7%) children had mild level and 3(10%) children had abnormal. In post test, 21(70%) children had normal and

9(30%) children had mild level. In Control group, the pre test Oxygen saturation level was 18(60%) children had moderate level, 10(33.3%) children had mild level and 2(6.7%) children had abnormal. In post test, 18(70%) children had mild level and 8(30%) children had normal, 4(30%) children had moderate level.

The mean post test score of respiratory signs in the experimental group 2.13 (SD±0.86) was significantly lower than the mean post test scored of respiratory signs in control group 3.36 (SD±1) and the mean difference was (1.23). Independent 't' value 5.2 (table value= 2.0017) which is significant at P< 0.05 level. The finding revealed that there is a significant reduction in respiratory signs between experimental group and control group.

The mean post test score of peak flow rate in the experimental group 68.6 (SD±5.14) was significantly higher than the mean post test scored of peak flow rate in control group 47.6 (SD±5.2) and the mean difference was (21). Independent 't' value 16 (table value= 2.0017) which is significant at P< 0.05 level. The finding revealed that there is a significant improvement in peak flow rate between experimental group and control group.

The mean post test score of oxygen saturation level in the experimental group 98.3 (SD±1.35) was significantly higher than the mean post test scored of oxygen saturation level in control group 96.4 (SD±1.59) and the mean difference was (1.9). Independent 't' value 5.27 (table value= 2.0017) which is significant at P< 0.05 level. The finding revealed that there is a significant improvement in oxygen saturation level between experimental group and control group.

There was significant association was found between respiratory signs in relation to pet animals' in house ( $\chi^2=3.88$ ) and type of allergy ( $\chi^2=9.432$ ) at (P < 0.05) level. No significant association in respiratory signs where found when compared to age, sex, education, residence, religion, order of birth,

family history of lower respiratory tract infections, frequency of attack in last year and duration of illness.

## **CONCLUSION**

The present study assessed the effectiveness of strelnikova breathing exercises on selected respiratory signs and parameters among children with Lower respiratory tract infections (LRTI) in Masonic Hospital, Coimbatore. Based on statistical findings, it is evident that strelnikova breathing exercises given among children with Lower respiratory tract infections significantly reduced the level of respiratory signs (independent 't' value =5.2), and increased the peak flow rate (independent 't' value=16), oxygen saturation level (independent 't' value=5.27). Therefore the investigator felt that, Strelnikova breathing exercises for children with Lower respiratory tract infections will reduce the respiratory sign and improve the respiratory parameters.

## **IMPLICATIONS FOR NURSING**

### **NURSING SERVICES**

- ❖ Self instructional module regarding breathing exercises given by the health personnel will help the children to improve their knowledge on exercises.
- ❖ Nursing service department can arrange health education programmes in the outpatient department for teaching the children on breathing exercises.
- ❖ Nurses as a change agent can introduce various breathing measures to reduce respiratory signs and improve lung function among children with lower respiratory tract infections.

### **NURSING EDUCATION**

- ❖ Imparting the concepts of promotive aspects in breathing exercises to nursing students.



- ❖ Nursing students must be encouraged to utilize knowledge on promotive measures to give health education and demonstration in hospital and community.

### **NURSING ADMINISTRATION**

- ❖ Administrators should take initiative action to update the knowledge of nursing personnel regarding breathing exercises in improvement of lung function and reducing the signs of respiratory illness by in-service education.
- ❖ Nurse administrators can conduct workshop and seminars on breathing exercises for lower respiratory tract infections to all level of nursing personnel in the hospital.
- ❖ To organize awareness camp regarding breathing exercises for children on special days.

### **NURSING RESEARCH**

- ❖ The study findings can be effectively utilized by the emerging researchers for their reference purpose.
- ❖ The research study enhances the scientific body of professional knowledge in the field of nursing science.

### **RECOMMENDATIONS**

- ❖ Similar study can be done in different settings (rural and urban).
- ❖ Similar study can be replicated on larger samples there by findings can be generalized.
- ❖ A comparative study can also be done between the effectiveness of various non-pharmacological measures for improving lung function among children.

### **LIMITATIONS**

- ❖ Since it is an exercise programme to the children, the researcher found difficulty in making them to understand and to co-operate to do the exercises.

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48. <http://www.lungusa.org/lung-disease/asthma/living-with asthma/take-control-of-your-asthma/measuring-your-peak-flow-rate.html>
49. <http://intl.ajcn.org>
50. <http://www.archpediatrics.com>

**APPENDIX – A**  
LETTER SEEKING PERMISSION FOR CONDUCTING THE STUDY

12/20/6/1



**MASONIC MEDICAL CENTRE FOR CHILDREN**

**(A UNIT OF COIMBATORE MASONIC CHARITY TRUST)**

232, RACE COURSE ★ COIMBATORE - 641 018 ★ PHONE : 2220663 (6 Lines)

FAX : 0422-2221765 ★ E-mail : info@masonichospital.org

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Date : .....

17<sup>th</sup> June, 2011

To

The Principal,  
Bishop's College of Nursing,  
C.S.I.Mission Compound,  
Dharapuram – 638 656.  
Tirupur Dist.

Madam,

With reference to your letter No. Nil dated 02.04.2011, we wish to inform you that we will permit your student Ms J. Arul vimala Mary – M.Sc Nursing to do you project on “A study to assess the effectiveness of Strelnikova breathing exercises on respiratory signs and parameters among children with Lower respiratory tract infections (LRTI)” in our Masonic Hospital.

A copy of this project report to be submitted to the Hospital.

This is for your kind information.

Thanking you,

Yours faithfully,

**(DR. R. KRISHNASWAMI)**  
**CHIEF MEDICAL OFFICER.**

**APPENDIX – B**  
**LETTER REQUESTING EXPERT’S OPINION FOR CONTENT**  
**VALIDITY**

From

Ms.J. Arul Vimala mary  
M.Sc. (Nursing) II year,  
Bishop’s College of Nursing,  
Dharapuram.

To

Respected Madam/Sir,

**SUB:** Requisition for content validity of tool

I am Ms.J.Arul Vimala Mary, M.Sc. (Nursing) second year student of Bishop’s College of Nursing, Dharapuram, under Dr. M.G.R Medical University, Chennai. As a partial fulfillment of my M.Sc. (N) Degree Programme, I am conducting a research on “A study to assess the effectiveness of Strelnikova breathing exercises on respiratory signs and parameters among children with Lower respiratory tract infections (LRTI) in Masonic Hospital, Coimbatore" One of the initial steps of the research study is to develop a tool. I am sending the above stated for content validity and for your expert and valuable opinion.

I will be very thankful to return it to the undersigned.

Yours sincerely,

(J. Arul Vimala Mary)

**Encl;**

Certificate of content validity

1. Statement of problem, objectives, operational definition, hypothesis
2. Description of the tool and tool for data collection
3. Self addressed envelope

**APPENDIX - C**  
**CHILD HEALTH NURSING**  
**LIST OF EXPERTS OF VALIDATION**

- 1) **Prof. Mrs.Vijayalakshmi , M.Sc(N).,**  
HOD,  
Department of Child Health Nursing,  
KG College of Nursing,  
Coimbatore.
  
- 2) **Mrs. Shanthi , M.Sc(N).,**  
Vice principal,  
HOD of Child Health Nursing,  
GKNM Institute of health science  
Coimbatore
  
- 3) **Mrs .Emerensia, M.Sc (N).,**  
Vice principal,  
HOD of Child Health Nursing,  
R.V.S. College of Nursing,  
Coimbatore.
  
- 4) **Mrs. J.Kavitha, M.Sc (N).,**  
Reader,  
HOD of Child Health Nursing,  
Sara Nursing College,  
Dharapuram.
  
- 5) **Dr.R. Krishnaswami,DCH**  
Chief medical officer,  
Masonic medical centre for children  
Coimbatore.

**APPENDIX - D**  
**CERTIFICATE FOR VALIDITY**

**This is to certify that the tool on** “A study to assess the effectiveness of Strelnikova breathing exercises on respiratory signs and parameters among children with Lower respiratory tract infections (LRTI)” in our Masonic Hospital, Coimbatore” has been validated by me and found appropriate with mentioned suggestions.

Signature : *N. Vijayalakshmi*  
Name : *N. Vijayalakshmi*  
Designation : *Professor*  
College : *K. G. College of Nursing.*



## CERTIFICATE FOR VALIDITY


**This is to certify that the tool on** “A study to assess the effectiveness of Strelnikova breathing exercises on respiratory signs and parameters among children with Lower respiratory tract infections (LRTI)” in our Masonic Hospital, Coimbatore” has been validated by me and found appropriate with mentioned suggestions.

Signature : P. Shanthi  
Name : P. SHANTHI  
Designation : VICE PRINCIPAL  
College : G.K.N.M. HOSPITAL

SHANTHI P.  
VICE PRINCIPAL  
INSTITUTE OF NURSING  
G.K.N.M. HOSPITAL  
COIMBATORE - 641 037.


## CERTIFICATE FOR VALIDITY

**This is to certify that the tool on** “A study to assess the effectiveness of Strelnikova breathing exercises on respiratory signs and parameters among children with Lower respiratory tract infections (LRTI)” in our Masonic Hospital, Coimbatore” has been validated by me and found appropriate with mentioned suggestions.

Signature :   
Name : X. EMERENSIA  
Designation : VICE PRINCIPAL  
College : R.V.S. COLLEGE OF NURSING.

## CERTIFICATE FOR VALIDITY


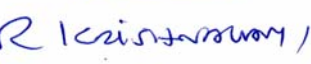
**This is to certify that the tool on** “A study to assess the effectiveness of Strelnikova breathing exercises on respiratory signs and parameters among children with Lower respiratory tract infections (LRTI)” in our Masonic Hospital, Coimbatore” has been validated by me and found appropriate with mentioned suggestions.

Signature :   
Name : Mrs. J. Kanika  
Designation : Reader, H.O.D.  
College : **Head of the Department,  
Paediatric Nursing**



## CERTIFICATE FOR VALIDITY

**This is to certify that the tool on** “A study to assess the effectiveness of Strelnikova breathing exercises on respiratory signs and parameters among children with Lower respiratory tract infections (LRTI)” in our Masonic Hospital, Coimbatore” has been validated by me and found appropriate with mentioned suggestions.

Signature :   
Name :   
Designation : **Dr. R. KRISHNASWAMI, DCH**  
Reg. No. 38424  
**CHIEF MEDICAL OFFICER**  
College : **Masonic Medical Centre for Children**  
**GOIMBATORE - 641 018.**

## APPENDIX – E

### CERTIFICATE OF ENGLISH EDITING

TO WHOM SO EVER IT MAY CONCERN

This is to certify that the dissertation work, “**A study to assess the effectiveness of Strelnikova breathing exercises on respiratory signs and parameters among children with Lower respiratory tract infections (LRTI) in our Masonic Hospital, Coimbatore**” done by Miss J. ARUL VIMALA MARY, II Year M.Sc.,(N) Student of Bishop’s College of Nursing, Dharapuram is edited for English Language appropriateness by\_\_\_\_\_

Date :

Address :



Signature

(P.SAMPATH)

**P. SAMPATH, M.A., M.Phil., M.Ed.,  
Lecturer in English,  
Maharani Teacher Training Institute,  
Dharapuram.**

**APPENDIX – F**

**CERTIFICATE OF TAMIL EDITING**

**TO WHOM SO EVER IT MAY CONCERN**

This is to certify that the dissertation work, “**A study to assess the effectiveness of Strelnikova breathing exercises on respiratory signs and parameters among children with Lower respiratory tract infections (LRTI) in our Masonic Hospital, Coimbatore**” done by Miss J. ARUL VIMALA MARY, II Year M.Sc.,(N) Student of Bishop’s College of Nursing, Dharapuram is edited for Tamil Language appropriateness by\_\_\_\_\_

**D.M.SENTHIL KUMAR, M.A., M.L.M.P.M.**  
**Guest Lecturer,**  
**Department of Tamil,**  
**Alagappa University Study Centre,**  
**DHARAPURAM - 638656.**

  
Signature

Date :

Address :

**APPENDIX – G**  
**Tools**  
**PART - I**  
**DEMOGRAPHIC VARIABLES**

**DEMOGRAPHIC DATA:-**

1. Age of the child (in years)
  - a) 6 to 8years
  - b) 9 to12years
  - c) 13 to 15 years
2. Sex
  - a) Male
  - b) Female
3. Education (in standard)
  - a) I -III
  - b) IV-VII
  - c) VIII-X
4. Residence
  - a) Rural area
  - b) Urban area
5. Religion
  - a) Christian
  - b) Hindu
  - c) Muslim
  - d) Others
6. Order of birth
  - a) First child
  - b) Second child
  - c) Third child
  - d) Fourth child and above

7. Family history of respiratory infections
  - a) Yes
  - b) No
8. Pet animals in home
  - a) Yes
  - b) No
9. Type of allergy
  - a) Dust
  - b) House mites
  - c) Food
  - d) No allergy
10. Frequency of attack in last year
  - a) None
  - b) 1 to 3 times
  - c) 4 to 5 times
  - d) Above 5 times
11. Duration of illness
  - a) 0 to 1 year
  - b) 2 to 3 years
  - c) 4 to 5 years
  - d) Above 5 years



**PART-II**  
**SEVERITY AND EXCERBATION GRADE TO ASSESS**  
**RESPIRATORY SIGNS**  
**[IAR Respiratory Chapter., (2003)]**

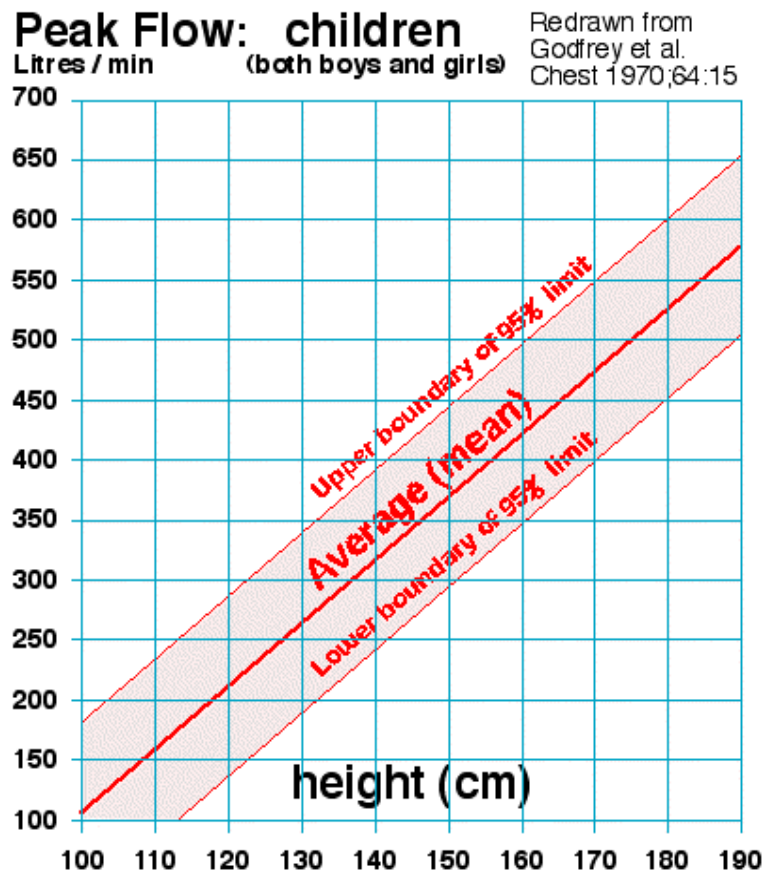
<b>Respiratory Rate</b>	<b>Score</b>	<b>Wheezing present</b>	<b>Score</b>	<b>Accessory muscle usage</b>	<b>Score</b>
<20	0	None	0	No apparent activity	0
21-35	1	Terminal expiration with stethoscope	1	Questionable increase	1
36-50	2	Entire expiration with stethoscope	2	Increase apparent	2
>50	3	During inspiration and expiration without stethoscope	3	Maximum activity	3
-	-	If wheezing absent	4	-	-
<b>Total score</b>	<b>3</b>	-	<b>4</b>	-	<b>3</b>

**SCORE**

- (0) score is Normal
- (1-3) score is Mild
- (4-6) score is Moderate
- (7-10) score is Severe

**PART-III**  
**GRADING OF PEAK FLOW RATE**  
 [Martin Stern., (2003)]

Peak flow zone	Percentage	Description
Green zone	90 to 100%	Normal
High yellow zone	70 to 90 %	Mild
Low yellow zone	50 to 70 %	Moderate
Red zone	Less than 50%	Severe



$$PFR = \frac{\text{PERSONAL PEAK FLOW RATE} \times 100}{\text{PREDICTED PEAK FLOW RATE}}$$

**PART-IV**  
**OXYGEN SATURATION LEVEL**

[Susan Roberts., (2005)]

Oxygen saturation level (%)	Description
98-100%	Normal
96-97%	Mild
91-95%	Moderate
< 91%	Abnormal

**APPENDIX-H**  
**INSTRUCTIONAL MODULE ON**  
**STRELNIKOVA BREATHING EXERCISES**

Here is the general idea that applies to each of 12 exercises. Do strong (audible) sniffs with nose only as you make (finish) a movement, and don't worry about the breathing out, it should come naturally. Sniff should be not prolonged or deep, but short and strong so that somebody could hear it from other side of the room.

Each exercise is done in first in portions of 4 sniffs, then short pause, then again. When this is easy go to 8 sniffs and then 16 without break. Totally make for each exercise 3 times 16 sniffs.

**(1) Palms**

Stand straight, bend hands with elbows down, showing your palms forwards towards an imaginary viewer in front of you. Make short loud sniffs while strongly and forcefully "grabbing" air with your fingers, forming a fist. When making a break between each 4 (or 8 or 16 sniffs, depending on your preference) lower and relax your hands.



**(2) Shake off hands**

Stand straight, place hands on the level of your belt, fingers are pressed in a fist. Make a short strong sniff, while pushing your fist down and backwards, as if shaking something off your hands. Return hands to the belt level and repeat.



**(3) Pump**

Stand straight with feet a bit wider than shoulders. Lean slightly forwards as you hands push



down as if pressing a ball on the floor. Palms reach about the level of knees. Sniff at the end of the movement (imitating the air coming out of the ball you are pushing, or as if you are pumping a bicycle tire).

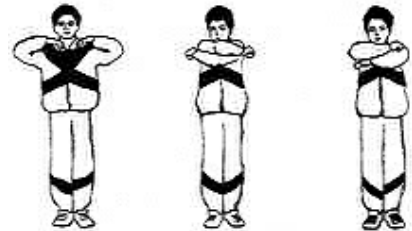
#### (4) Cat

Stand straight, feet on shoulder width. Make dance-like sitting down with simultaneous turn of upper-body and hands to the right as if catching something. At the end of movement, when you catch - sniff. Repeat same to the left.



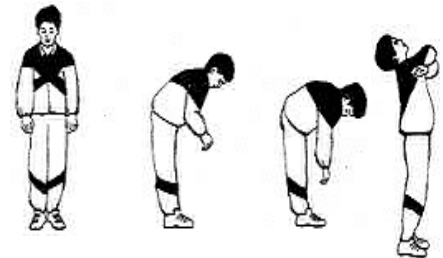
#### (5) Hug the shoulders

Stand straight with hands up on the level of your shoulders and bent so that they make together a square. Move strongly both hands towards each other until they make together a triangle - at the end of the movement sniff. At the moment of movement head can swing slightly backwards.



#### (6) Hug and push

Stand straight with feet a bit wider than shoulders. Lean slightly forwards as you hands push down as if pressing a ball on the floor. Palms reach about the level of knees. Sniff at the end of the movement (imitating the air coming out of the ball you are pushing). So far it is same as exercise (3). Now straighten up and make "Hugging" also with the sniff when hands reach "triangle" position. Repeat while counting sniffs in 4 portions.



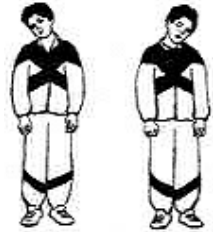
### (7) Head turns

Stand straight, feet on shoulder width. Turn head left - sniff at the end of movement, then right - sniff and the end of movement. Don't stop in the middle, only at the right and left end of the turn. Only head turns, body is not moving.



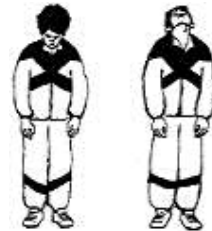
### (8) Touch shoulders with ears (I call it "surprised dog")

Stand straight, feet slightly narrower than shoulder width. Lean the head right so that ear almost touches the shoulder. Sniff at the end of movement. Repeat to the left.



### (9) Up and downs

Stand straight, feet slightly narrower than shoulder width. Lean head forwards (facing floor) - sniff. Lean head backwards (facing ceiling) - sniff. Note that in all exercises sniff does not come after the movement, but simultaneously with last phase of the movement and finishing together with the movement as if caused by the movement.



### (10) Rolling

Stand so that left foot is forwards and straight, right foot is backwards and bent. Place the weight on left foot.

Now slightly sit down on left foot, bending it as if dancing. Simultaneously with end of the movement make sniff. Now move weight on the right foot (which is placed backwards) and slightly sit on it, bending it more and making sniff at the end of movement. Repeat both movements while counting sniffs.



### (11) Up-kicks

Stand straight, feet slightly narrower than shoulder width. Pull up left foot, bend in the knee, so that knee reaches the level of the abdomen. (see left image)



From the knee down the foot is straight, pull the toe forward as in ballet. In the same time slightly sit down on the right foot and make strong short audible sniff. Get both feet completely straight for a moment. Repeat same with right foot up so that knee reaches abdomen, while sitting down slightly on left knee and sniffing. Upper body remains straight.

**(12)Back-kicks** (see right image above)

Stand straight, feet slightly narrower than shoulder width. Move left foot; bend in the knee, backwards as if kicking you on the bottom with the sole. Simultaneously slightly sit-down on the right foot and make a short strong sniff. Get both feet completely straight for a moment, then repeat same with opposite foot.

## ஸ்டிரிமின்கோவா மூச்சுப் பயிற்சி பற்றிய தகவல் கையேடு

பன்னிரெண்டு மூச்சு பயிற்சிக்கும் பொதுவான விதிமுறைகள்

மூக்கினால் காற்றை உறிஞ்ச வேண்டும்இ அப்படி உறிஞ்சும் போது குறுகிய நேரத்தில் விரைவாக எடுக்க வேண்டும். ஆனால் அதிக நேரமோஇ ஆழமாகவோ இழுத்தல் கூடாது. அதை அறையில் இருக்கும் மற்றவர் கேட்க கூடியதாக இருக்க வேண்டும். உள்ளிழுக்கும் மூச்சுகாற்று இயற்கையாகவே வெளியே வந்துவிடும்.

ஒரு மூச்சுபயிற்சி தொடங்கும் போது முதலில் 4 முறை மூக்கினால் காற்றை உள்ளுக்குத் திரும்ப திரும்ப இழுக்க வேண்டும். பிறகு சிறிது இடைவெளி (3-4 நொடிகள்) விட்டு மூச்சை உள்ளிழுக்க வேண்டும். இது போன்று இடைவெளி இல்லாமல் 8 மற்றும் 16 முறை மூச்சை உள்ளிழுக்க பயிற்சி செய்ய வேண்டும். ஒவ்வொரு மூச்சு பயிற்சியையும் 3 முறை பண்ணலாம்.

### மூச்சு பயிற்சிகள் பின்வருமாறு

#### 1. உள்ளங்கை நிலை

நேராக நின்று கை மூட்டு கீழே வரும்படி கைகளை மடக்க வேண்டும். மூச்சை உள்ளிழுக்கும் போது உள்ளங்கை விரல்களை இறுத்தி பிடிக்க வேண்டும். இந்த நிலையில் இருந்து மூச்சு பயிற்சி எடுக்க வேண்டும்.



#### 2. கைகளை அசைக்கும் நிலை

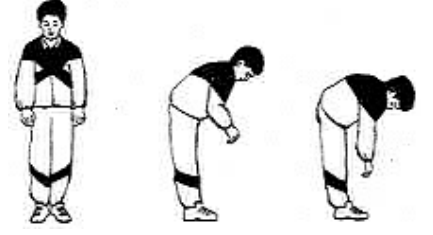
நேராக நின்று கைகளை இடுப்பு அளவில் வைக்கவும். விரல்களை உள்ளங்கையில் அழுத்தி பிடிக்க வேண்டும். மூச்சை உள்ளிழுக்கும் போது மடக்கிய கைகளை கீழே மற்றும் பின்னாக கொண்டு வரவும். மறுபடியும் கைகளை ஆரம்ப நிலைக்கு கொண்டு போய் மீண்டும் இதே போல் பயிற்சிக்கவும்.





### 3. காற்றடிக்கும் நிலை

நேராக நின்று காலை அகலப்படுத்தி நிற்கவும். தோல்பட்டைகளையும் விரித்து வைக்கவும். முன்னோக்கி குனிந்துஇ தரையை நோக்கி ஒரு பந்தை அழுக்குவது போல கைகளை வைக்கவும். உள்ளங்கைகளை கால் மூட்டுகளுக்கு நேராக வைக்கவும். இந்நிலையில் மூச்சுப் பயிற்சி செய்யவும்.



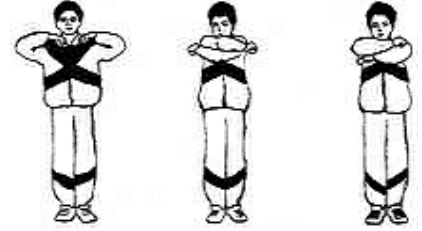
### 4. பூனை நிலை

நேராக நின்று பாதங்களையும் தோல்பட்டைகளையும் சீராக வைக்கவும். நடனம் ஆடுவது போல் சற்று உட்கர்ந்து மேல்பக்க உடம்பை மட்டும் வலது பக்கமாக திரும்பி ஏதோ ஒன்றை பிடிப்பது போல் பாவனை செய்யவும். இதன் இறுதியில் முச்சு மூச்சுப் பயிற்சி செய்யவும். இதை இடது பக்கமும் செய்யவும்.



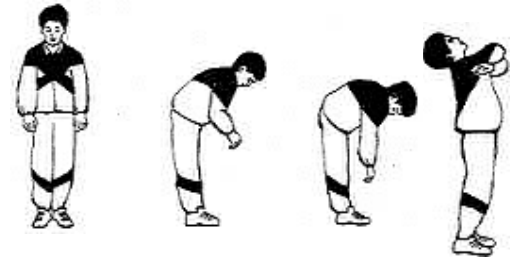
### 5. தோல்பட்டையை பிடித்த நிலை

நேராக நின்று கைகளை தோல்பட்டைக்கு நேராக வைத்து பின் சதுரம் வரும் வண்ணம் கைகளை பிடிக்கவும். அதன் பின் முக்கோண வடிவம் வரும் வண்ணம் அழுத்தி பிடிக்கவும். இதன் இறுதியில் மூச்சுப் பயிற்சி செய்யவும். இதை பயிற்சி செய்யும் போது தலையை சற்று கீழே கவிழ்க்கவும்.



### 6. காற்றடிக்கும் நிலை மற்றும் தோல்பட்டையை பிடித்த நிலை

மூன்றாம் மூச்சு பயிற்சியையும் மற்றும் ஐந்தாம் மூச்சுபயிற்சியையும் சேர்த்து செய்யவும்.



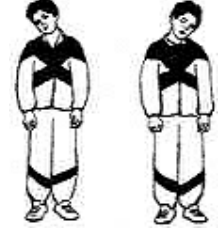
### 7. தலையை திருப்பிய நிலை

நேராக நின்று பாதங்களை தோல்பட்டை அளவுக்கு அகலப்படுத்தவும். தலையை இடது பக்கமாக திருப்பி மூச்சுப் பயிற்சி செய்யவும். இதே போல் வலதுபுறமும் மூச்சுப் பயிற்சி செய்யவும். தலையை மட்டும் திருப்ப வேண்டும் உடம்பு அசைய கூடாது.



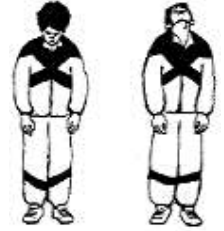
### 8. தோல்பட்டைகளை காதால் தொடுதல்

நேராக நின்று கால்களை சுருக்கி தோல்பட்டைகளை அகல படுத்த வேண்டும். தலையை வலதுபுறமாக சாய்த்து காதுகள் தோல்பட்டைகளை தொடும்படி செய்ய வேண்டும். இதன் இறுதியில் மூச்சுப் பயிற்சி செய்யவும்.



### 9. தலையை மேலும் கீழும் அசைத்த நிலை

நேராக நின்று பாதங்களை குறுக்கி தோல்பட்டைகளை அகலப்படுத்தவும். தலை தரையை பார்த்து குனிந்த நிலையில் மூச்சுப் பயிற்சி செய்யவும். இதனை தொடர்ந்து தலையை மேலே பார்த்த நிலையில் மூச்சுப் பயிற்சி செய்யவும்.



### 10. குத்துசண்டை நிலை

நின்ற நிலையில் இடதுகாலை முன்னோக்கி நேராக வைத்து வலது காலை மடக்கி பின்புறமாக வைக்கவும். உடம்பின் எடை இடது பாதத்தில் படும்படி நிற்கவும். இதன் இறுதியில் மூச்சுப் பயிற்சி செய்யவும். இதே போல் உடம்பின் எடை வலது பாதத்தில் படும்படி செய்து மூச்சுப் பயிற்சி செய்யவும்.



### 11. காலால் மேல் நோக்கி உதைத்த நிலை

நேராக நின்று பாதங்களை சுருக்கி தோல்பட்டைகளை அகலப்படுத்தவும். இடது காலை தூக்கி மூட்டு பகுதி வயிற்றுப்பகுதியை தொடும்படி செய்யவும். அதன் பின் காலை மூட்டு பகுதிக்கு நேராக வைக்கவும். கால்விரல்கள் தரையை நோக்கிய நிலையில் வைக்கவும். இதே நேரத்தில்



வலதுகால் பக்கம் சற்று உட்கார்ந்த நிலையில் மூச்சுப் பயிற்சி செய்யவும். இந்த மூச்சு பயிற்சி செய்யும் போது இடுப்புக்கு மேல் உள்ள பாகம் நேர் நிலையில் இருக்க வேண்டும். இதே போல் வலது காலை தூக்கி மூட்டு பகுதி வயிற்றுப்பகுதியை தொடும்படி செய்யவும். அதன் பின் காலை மூட்டு பகுதிக்கு நேராக வைக்கவும். கால்விரல்கள் தரையை நோக்கிய நிலையில் வைக்கவும். இதே நேரத்தில் இடதுகால் பக்கம் சற்று உட்கார்ந்த நிலையில் மூச்சுப் பயிற்சி செய்யவும்.

## 12. காலால் பின்னோக்கி உதைத்த நிலை

நேராக நின்று பாதங்களை சுருக்கி தோல்பட்டைகளை அகலபடுத்தவும். இடது காலை பின்னோக்கி திருப்பி மூட்டுகளை மடக்க வேண்டும். மெதுவாக கீழே வலதுகால் பக்கமாக உட்கார்ந்து மூச்சுப் பயிற்சி செய்யவும். இதே போல் வலது காலை பின்னோக்கி திருப்பி மூட்டுகளை மடக்க வேண்டும். மெதுவாக கீழே இடதுகால் பக்கமாக உட்கார்ந்து மூச்சுப் பயிற்சி செய்யவும்.

**APPENDIX - I**  
**ASSESSING RESPIRATORY SIGNS**



**ASSESSING PEAK FLOW RATE**



## ASSESSING PEAK FLOW RATE



## ASSESSING OXYGEN SATURATION LEVEL





**CAT EXERCISE**



**ROLLING EXERCISES**



## HUG THE SHOULDERS EXERCISES



## PALMS EXERCISES



## **PUMP EXERCISES**



## **TOUCH SHOULDERS WITH EARS EXERCISES**





DISTRIBUTING INSTRUCTIONAL MODULE

