CHAPTER I

INTRODUCTION

1.1 Background of the study

Breath is a dynamic bridge between the body and mind. Every tissue within the body requires oxygen to function. The respiratory system, which includes air passages, pulmonary vessels, the lungs, and breathing muscles, provides oxygenated blood to the body tissues and removes waste gases. The breath influences the activities of each and every cell. And most importantly, it is intimately linked with the performance of the brain. Breathing is an essential part of life bringing oxygen in to the body and releasing carbon dioxide out for the normal functioning of the brain and other bodily systems. In the Science of Pranayama, Swami Sivananda writes, “There is an intimate connection between the breath, nerve currents, and control of the inner prana or vital forces”.

Non-communicable diseases (NCD)

Non-communicable diseases (NCD) chiefly cardiovascular diseases, cancers, chronic respiratory diseases and diabetes impose a large burden on human health worldwide. It is distributed widely among the world’s population from high to low income countries and from young to old below the age of 60, amounting approximately 9 million deaths per year and 48 % of the disability adjusted life years lost (DALYs). NCDs have been established as a clear threat not only to human health, but also to development and economic growth. Claiming 63 % of all deaths, these diseases are currently the world’s main killer (The Global economic burden of NCD, 2011).
World Health Organization (WHO) has identified the term “Best Buys” which means the numerous options available to prevent and control NCDs. (Masoli M, Fabian D, Holt S, Beasley R, 2004).

India, along with other developing nations, is facing a well – documented epidemiological health transition and a “double burden” that sees the arrival of Non-communicable diseases with their shared risk factors on top of the persisting heavy load of infectious and communicable diseases (Yusuf et al., 2001; Reddy., 2003; Perel et al., 2006; To., 2012), a situation that has been described as ‘a race against time’ (Adeyi et al., 2007).

Asthma

Ever wondered what asthma means? When people talk about asthma, they are really talking about asthma, a chronic inflammatory disease of the airways that causes periodic "attacks" of cough, wheezing, shortness of breath, and chest tightness.

Asthma is a serious public health problem and a major cause of disability. (Bateman et al., 2008; Eisner et al., 2012). Asthma is a chronic inflammatory disorder of the lungs that can lead to structural and functional changes, resulting in bronchial hyper responsiveness and airflow obstruction. (Taylor 2008; Holgate 2009; Zhang 2010; Allen 2012; Brightling 2012). Symptoms of asthma include recurrent episodes of wheeze, cough, breathlessness and chest tightness, together
with episodes of marked worsening of symptoms, known as exacerbations. (Bateman 2008; Zhang 2010; Brightling 2012).

Asthma usually arises from an interaction between host and environmental factors. A rapid increase in asthma in recent years cannot be ascribed to changes in genetic factors, but rather, to changes in environmental factors (Trupin et al., 2010).

There is no cure for asthma, but the good news is, it can be managed and controlled to lead a normal, healthy life.

Asthma is a common long-term respiratory condition, and people can have episodes of exacerbations of symptoms which are also known as asthma attacks. (GINA, 2014). The most common reasons are non-adherence to treatment, poor knowledge and skills in disease management (GINA guidelines, 2007). Uncontrolled asthma and ineffective management remains a public health challenge in the developing countries like India.


Prabhakaran et al., (2006) reported that well-structured asthma education with reinforcement by the health care professionals is the key to achieve effective self-care management of asthma.
Ignacio-Garcia JM et al., (GINA 1995; 2005) stated that when patients understand the risks of non-compliance and benefits of compliance and believe the treatment is safe, it will increase their motivation and confidence to improve their self-management practices.

According to the CDC (2009), more than 22 million Americans, including 6.5 million children under 18, suffer from asthma today.

Bronchial asthma is a condition which results in restriction of the physical, emotional and social aspects of a patient’s life. The most important goal in the management of bronchial asthma is the maintenance of a normal Quality of Life (QOL) for the patient.

**Mechanism of the disease**

Asthma was first recognized and named by Hippocrates circa 450 BC. During the 1930s–50s, asthma was considered as being one of the 'holy seven' psychosomatic illnesses. Its aetiology was considered to be psychological, with treatment often based on psychoanalysis and other 'talking cures'. As these psychoanalysts interpreted the asthmatic wheeze as the suppressed cry of the child for its mother, so they considered that the treatment of depression was especially important for individuals with asthma.

Among the first papers in modern medicine, is one that was published in 1873 and this paper tried to explain the pathophysiology of the disease. And one of the first papers discussing treatment of asthma was released in 1872, the author
concluded in his paper that asthma can be cured by rubbing the chest with chloroform liniment. Among the first time researchers referred to medical treatment was in the year 1880, where Dr. J. B. Berkart used IV method to administer doses of drug called Pilocarpin. In the year 1886, F.H. Bosworth FH suspected a connection between asthma and hay fever. Epinephrine was first referred to in the treatment of asthma in 1905, and for acute asthma in 1910.

The term “Allergic March” (also called “Atopic March”) refers to the natural history of atopic manifestations, which is characterized by a typical sequence of immunoglobulin E (IgE) antibody responses and clinical symptoms which may appear early in life, persist over years or decades and often remit spontaneously with age. It is frequently misunderstood as the development from minor symptoms over a mild disease expression towards more severe chronic manifestations. It also has been misinterpreted as the exclusive development from atopic dermatitis in infancy to airway disease, particularly asthma in school-age. These interpretations have been shown to underestimate the variations and heterogeneity of atopy development during the first decade of life. (WAO, 2007)

![The Allergic March](Allergy Cosmos, 2013)

Figure 1. The Allergic March (Allergy Cosmos, 2013)
Evolution of Asthma: More than Just a Lung Disease

Asthma Foundation Victoria (2010)

The word asthma was first used by the ancient Greeks, as "asthme," which means short, gasping breaths.

Basically, even into the early 20th century, all that caused shortness of breath was referred to as asthma, including bronchitis, emphysema, pneumonia and heart failure. Yet eventually those diseases earned their own categories, and the definition of asthma evolved into what we know it, as today.

By 1959 asthma was defined as a disease where the air passages (bronchioles) of lungs become narrow (bronchospasm) and this is reversible either spontaneously or with medicine.

By 1962 asthma was defined as a disease whereby the bronchioles become hyper responsiveness and narrow as a result of exposure to various stimuli (asthma triggers).

By 1987 the key component was defined as airway obstruction caused when the lungs are exposed to asthma triggers. This obstruction consists of airway narrowing caused by bronchial muscle spasms (bronchospasm), increased mucus production, and swelling of the cells surrounding the lungs (inflammation).

By 2000, the term evolved to include two key components.
Acute Bronchospasm: Exposure to asthma triggers can make this inflammation worse, thus causing airway narrowing. This can be reversed with time or with medicine. Likewise, in many cases, this can be prevented with medicines, control of inflammation, and avoidance of asthma triggers.

Chronic inflammation: Swelling of the airways that is always there. The severity of asthma is determined by the degree of swelling. Likewise, this swelling can be controlled with asthma controller medicines.

That's where we stand today, although with studies ongoing, and scientists now studying the newly found asthma genes, it's possible this definition will continue its evolution.

Figure 2. Evolution of Concept of Asthma
Asthma is defined by the Global Initiative for Asthma (2014) as "a chronic inflammatory disorder of the airways in which many cells and cellular elements play a role. The chronic inflammation is associated with airway hyper responsiveness that leads to recurrent episodes of wheezing, breathlessness, chest tightness and coughing particularly at night or in the early morning. These episodes are usually associated with widespread, but variable airflow obstruction within the lung that is often reversible either spontaneously or with treatment."

Asthma is a disease of diffuse airway inflammation caused by a variety of triggering stimuli resulting in partially or completely reversible bronchoconstriction. The diagnosis is based on history, physical examination, and pulmonary function tests. Treatment involves controlling triggering factors and drug therapy, most commonly with inhaled $\beta_2$-agonists and inhaled corticosteroids. Prognosis is good with treatment.

Previously asthma was classified by disease severity based on symptoms, airflow limitation and lung function. The use of severity in classifying asthma patients has certain limitations such as a poor value in predicting what treatment was most appropriate and the sort of response to expect. Chen H, Gould MK, Blanc PD, Miller DP, Kamath TV, Lee JH, et al., (2007) Disease severity is not a constant feature of an individual patient’s asthma but varies over time. Therefore, periodic assessment of asthma control is more relevant to asthma management. Asthma classification was revised from the previous system, which utilized disease severity to the use of control of asthma. Asthma control may be defined in several ways: Generally, diseases control may indicate disease prevention, or
even cure. However, in asthma, where neither of these is currently possible, it refers to control of the clinical manifestations of disease Global Strategy for Asthma Management and Prevention (2010).

The control of asthma symptoms is a realistic goal and studies have shown that this can be achieved in most asthma patients leading to a higher quality of life. Bateman ED, Boushey HA, Bousquet J, Busse WW, Clark TJ, Pauwels RA, et al. (2004) In spite of this, the control of asthma is generally poor. The Asthma Insights and Reality in Europe study reported persistence of day time symptoms of up to 46% among asthmatics under treatment. Rabe KF, Vermeire PA, Soriano JB, Maier WC (1999) Surveys from other parts of the world reveal a similar picture of suboptimal control. Local studies are in agreement with the world-wide picture with more than two-thirds of patients having sub-optimal control in some surveys. Ozoh OB, Bandele OE, Chukwu C, Okubadejo N (2010).

The Global burden of asthma

As of 2011, approximately 235 million people worldwide were affected by asthma (Moores G et al, 2012), and approximately 250,000 people die per year from the disease (World Health Organization, 2004). Over 80% of asthma deaths are reported from low and lower-middle income countries (Braman et al., 2006), 8.6% of young adults (aged 18 to 45) experience asthma symptoms.

Asthma is the 14th most important disorder in the world in terms of the extent and duration of disability. Low and middle income countries make up more than 80% of the mortality (GINA, 2015). Rates vary between countries with
prevalence between 1% and 18%. It is more common in developed than developing countries. One thus sees lower rates in Asia, Eastern Europe and Africa.

Prevalence increases globally by 50% every decade. Low prevalence rate of 2%–4% in Asian countries. High prevalence rates of 15% to 20% in the Western countries. Prevalence is rising sharply with increasing Urbanisation and Westernisation (Masoli et al. 2004).

Asthma is a serious global health problem affecting all age groups, with global prevalence ranging from 1% to 21% in adults, the global burden for patients from exacerbations and day-to-day symptoms has increased by almost 30% in the past 20 years.

There is increasing recognition of its impact upon working-age adults, the importance of adult-onset asthma, and the contribution of undiagnosed asthma to respiratory symptoms and activity limitation in the elderly (GBD, 2010).

With the projected increase in the proportion of the world’s population that is urban from 45% to 59% in 2025, there is likely to be a marked increase in the number of asthmatics worldwide over the next two decades. It is estimated that there may be an additional 100 million persons with asthma by 2025 (Masoli et al, 2004).
Country specific data

Asthma affects approximately 7% of the population of the United States and causes approximately 4,210 deaths per year. From 2000 through 2010, the rate of hospital visits for adults remained about 119 per 100,000 population. Asthma affects approximately 5% of the United Kingdom’s population. In England, an estimated 2,61,400 people were newly diagnosed with asthma in 2005. The highest prevalence was observed in Australia, Northern and Western Europe and Brazil (South Asia Network for Chronic Disease, 2009).

Prevalence

Bronchial asthma is a disease with increasing global significance. It is estimated that by the year 2025, the prevalence would have risen from the current 300 million to 400 million worldwide. Asthma creates a substantial burden on individuals and families as it is more often under-diagnosed and under-treated (Rabe et al, 2000, Adachi et al, 2002, Lai et al, 2003).

World Health Organization (WHO) statistics show that about 235 million people worldwide have asthma and the burden of this disease to government, health care systems, families, and patients is increasing worldwide.

There are only a few studies from India on epidemiology of asthma. In a study conducted more than 30 years ago, prevalence of asthma was reported to be 2.78% in an urban population aged 30-49 years. The prevalence was found to vary from 4.3% to 6.9% in the Indian population (Aggarwal et al., 2006). Clinically diagnosed asthma in adults has been reported to be 2.7% to 4.0% in
most of the European countries, while in England and U.S, it accounts to 12% and 7.1% respectively. In Australia, the prevalence is comparatively high as 9.5% to 17.9% (Ortega A N et al 2002).

Thirty percent of the world's population suffers from asthma or related breathing disorders. In India, the figure hovers around 18 per cent, according to World Health Organization.

Asthma is a lifestyle disease and can be managed if people follow the instructions of treating physician. Yet, most people still think that asthma is a condition where a person needs to struggle for breath.

Frazier et al (2012), found that the prevalence of self-reported current asthma among adults is similar in metropolitan and nonmetropolitan countries in Montana of the USA, although other socio-demographic differences existed.

The worldwide high prevalence of asthma has become a public health problem because of the high healthcare costs resulting from hospitalization and medication. (Giavina – Bianchi, 2010).

Based on the Global Burden of Disease (GBD 2010), the majority of DALYs due to asthma arise from years of healthy life lost due to disability (YLD). Out of the 164 conditions included in the comparison, the world ranking of burden of disease for asthma was:
- 14th highest when measured by YLD
- 28th highest when measured by DALY. (Institute for Health Metrics and Evaluation 2013).
- Exposure or sensitization to indoor pollutants, including cigarette smoke (Hersoung et al., 2010), air pollution (Trupin et al., 2010), and allergens (Dottorini et al., 2007).
- The prevalence of asthma morbidity between urban and rural area may result from increasing urbanization, or from socioeconomic and cultural factors, as well as individual societal factors (Smith et al., 2009).

<table>
<thead>
<tr>
<th>Non–communicable conditions</th>
<th>Estimate of cases / lakhs</th>
<th>Projected number by 2015 cases / lakhs</th>
</tr>
</thead>
<tbody>
<tr>
<td>COPD and asthma</td>
<td>405.20 (2001)</td>
<td>596.36</td>
</tr>
<tr>
<td>Diabetes</td>
<td>310</td>
<td>460</td>
</tr>
<tr>
<td>Mental Health</td>
<td>650</td>
<td>800</td>
</tr>
<tr>
<td>Blindness</td>
<td>141.07</td>
<td>129.96</td>
</tr>
<tr>
<td>CVD’s</td>
<td>290 (2001)</td>
<td>640</td>
</tr>
</tbody>
</table>

According to Global Burden of Disease estimation, 2005 it was estimated that 405.20 cases per one lakhs population affected with COPD and asthma; projected to increase by 596.36 cases per one lakhs by 2015.
Most of the Asian countries including India and China, although relatively lower prevalence rates are found than those in the west, they account for a huge burden in terms of absolute numbers of patients (Jindal., 2007; Aggarwal et al., 2006; Wong and Chan-Yeung., 2005).

**Economic burden of asthma**

Globally, the economic costs associated with asthma exceeds than those of communicable diseases such as tuberculosis and HIV/AIDS, both in terms of direct costs (hospital admissions and cost of pharmaceuticals) and indirect medical costs (time lost from work and premature death).

**Asthma burden in India**

There is limited data on Asthma epidemiology from the developing world, including India (Subbarao et al 2009). The total estimated burden of asthma is an overall prevalence of 3% (30 million patients), and among adults over the age of 15, a median prevalence of 2.4% (Aggarwal et al., 2006).

**The scale of the problem in India (WHO, 2004)**

Asthma is not just a public health problem for developed countries. In developing countries, however, the incidence of the disease varies greatly. India has an estimated 15 to 20 million asthmatics. The rough estimates indicate a prevalence of between 10% and 15%, 57,500 estimated total deaths / year, 5.1 estimated deaths / 1,00,000 population, 277 DALYs (disability adjusted life-year) / 100,000 population, constitutes 0.2% of all deaths and 0.5% of National Burden of Diseases. Overall prevalence in India was estimated to be 3% (Aggarwal et al., 2006).
Table 2. Summary of the important population studies from India on Prevalence of Asthma (Indian Study on Epidemiology of Asthma, Respiratory symptoms and Chronic bronchitis-INSEARCH, 2010)

<table>
<thead>
<tr>
<th>Author</th>
<th>Region</th>
<th>Group</th>
<th>No.</th>
<th>Age (years)</th>
<th>Prevalence (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Viswanathan (1996)</td>
<td>North</td>
<td>Urban</td>
<td>15805</td>
<td>All ages</td>
<td>1.8</td>
</tr>
<tr>
<td>Aggarwal (2006)</td>
<td>Multicentric</td>
<td>Rural</td>
<td>73605</td>
<td>&gt;15</td>
<td>2.4</td>
</tr>
</tbody>
</table>

Table 3. According to the National Health Interview Survey (NHIS), 2013

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Number with Current Asthma (in thousands)</th>
<th>Percent with Current Asthma</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult (Age 18+)</td>
<td>16,540</td>
<td>7.0%</td>
</tr>
</tbody>
</table>

Economic burden of asthma

Asthma cost the US about $3,300 per person with asthma each year from 2002 to 2007 in medical expenses, missed work days, and early deaths. Asthma costs in the US grew from about $53 billion in 2002 to about $56 billion in 2007, about a 6% increase. One-third (33%) of adults who had an asthma attack missed work because of asthma in 2008. On average, in 2008 adults missed 5 days of work because of asthma (National commission on Macroeconomics and Health, 2005).
Asthma prevalence according to National family Health Survey-3, 2005-2006

The overall prevalence of asthma among adult men and women in India is 1,696 and 1,627 per 1,00,000 respectively. Prevalence of asthma is higher in rural areas (1,719 per 1,00,000 for women and 1,799 per 1,00,000 for men) than for urban areas and that it is more common among women than men.

States differentials in asthma prevalence

The prevalence ranges from 384 per 100,000 in Himachal Pradesh to 5,924 per 1,00,000 in Tripura among women and from 407 in JharKhand to 5,086 per 1,00,000 in Tripura among men. The number of women with asthma exceeds 1,000 per 1,00,000 in 23 states and is exceptionally high (above 3,000 per 100,000) in five states: West Bengal (3,304), Mizoram (3,563), Kerala (4,037), Sikkim (5,150) and Tripura with the highest prevalence whereas this is true for men in only 2 states; West Bengal and Tripura.

1.2 Need for the study

Asthma has been associated with symptomatic hyperventilation, which decreases carbon dioxide levels, causing hypocapnia. (Thomas 2001; Lafey 2002; Bruton 2005). In addition, psychological symptoms may interfere with the severity of the respiratory symptoms and may influence patients’ quality of life. Thus, an important component of asthma management is identifying individual issues that impair health-related quality of life and treating them. (Rimington 2001; Juniper 2004).
Asthma is a world-wide problem, with an estimated 300 million affected individuals. The global prevalence of asthma is estimated in the range of 1% to 18% of the population in different countries Masoli M, Fabian D, Holt S, Beasley R., (2004). In Nigeria, the prevalence of asthma is not known for certain but several surveys using asthma symptoms as surrogates for asthma have come up with estimates of between 7% and 14% while the prevalence of physician diagnosed asthma ranges between 1.8% and 6% Desalu OO, Salami AK, Oluboyo PO (2009).

In an attempt to tackle the problem of asthma, the United States National Heart, Lung and Blood institute (NHLBI) and the world Health Organization (WHO) in 1997 convened a workshop on asthma. The workshop report presented a comprehensive plan on the management and prevention of asthma; the global initiative for asthma (GINA). Global Strategy for Asthma Management and Prevention (2010). This initiative has come up with guidelines, which are regularly updated and the information widely disseminated to health workers and patients, in which asthma management was divided into six inter-related parts, of which patient education is clearly an essential component.

Patient education is becoming an essential area of service provision, with our increasing population of people with chronic disease and conditions requiring long term management in the community (Prabhakaran et al, 2006).
Asthma patients should be made aware that a positive attitude towards treatment is a pre-requisite for good disease management. The lack of understanding about asthma may be crucial if the patient is not able to judge the severity of his/ her disease or symptoms or does not know the right treatment.

The primary focus of patient education and asthma management strategies should be to identify negative behaviours and work towards positive behavioral changes.

Asthma needs to be managed by the individual, or by their carer, and it is important that people understand how to manage asthma (gained through education, personal experience or professional guidance) to help them manage exacerbations/ attacks. (BTS, 2014).

Although no cure for asthma is known; its symptoms are controllable in most patients. (Taylor, 2008). Asthma treatment can be pharmacological or non-pharmacological or a combination of the two associated with strategies of symptom control (environmental triggers and asthma education) (Wolf 2008; Burgess 2011; GINA 2011; Welsh 2011).

Asthma is associated with poorer quality of life, with disease severity and the level of control both having an impact. Asthma may have varying degrees of impact on the physical, psychological and social wellbeing of people living with the condition.
Number of misconceptions about asthma are prevailing among Indian patients. The diagnosis of asthma is not acceptable to vast majority of patients due to the stigma. There is a prevalence of inadequate awareness about various aspects of asthma among patients. (Singh et al, 2002)

Non–pharmacological interventions have gained attention in the treatment of asthma. Complementary and Alternative Medicine (CAM) includes breathing exercises and yoga, reflexology, massage, inspiratory muscle training and the Alexander technique. (Blanc 2001; Ram 2009; Dennis 2012; McCarney 2012).

As a result, treatment plans can be developed including the integration of yogic practices into the asthmatics lifestyle to manage their chronic conditions (Kumar and Clarke, 2007)

WHO recognizes Asthma as a disease of major public health importance and needs international efforts against the disease (WHO Fact Sheet No. 206, 2000). It argues that international action is needed to:

- Increase public awareness of the disease to make sure patients and health professionals recognize the disease and are aware of the severity of associated problems;
- Develop and implement an optimal strategy for its management and prevention
- Stimulate research into the cause of Asthma to develop new control strategies and treatment techniques.
The success of a medical regimen prescribed for a particular patient often depends, in large part, on three variables: the patient’s attitude toward the illness, including his or her willingness to work with the physician to manage the disorder; the patient’s confidence in his or her ability to contribute to the management of the illness; and the patient’s knowledge regarding the illness, which enables the patient to perform appropriate procedures to control particular symptoms. (Joan K. Wigal, 1993).

Asthma education including avoidance of asthma triggers, self-monitoring of asthma symptoms, use of asthma action plans, and adherence to prescribed asthma medications are beneficial in reducing asthma morbidity. (NAEPP, 1997; 2003).

Cost-effectiveness of asthma education programs

There is increasing evidence that comprehensive patient education programs are cost-effective (Trautner et al., 1993; Greineder et al., 1995; Fireman et al., 1981; Lewis et al., 1984; Clark et al., 1986). The resulting increase in patient drug use, observed in some studies (Mitchell et al., 1986; Evans et al., 1997), especially in low income populations, and in the number of physician visits per patient (Evans et al., 1983) are outweighed by the reduction in emergency department visits and hospitalizations (Clark et al., 1986).

An educational program conducted by a specially trained nurse in the emergency department led to a savings of $87,000 through a 79% decrease in emergency department visits and an 86% decrease in hospitalizations.
(Greineder et al., 1995). In Germany an education program yielded savings of 5.8 million marks per year, by a decrease per patient of 3.8 visits to the emergency department, 5.2 hospitalization days, 8.2 working days, and 20 visits to the primary physician (Trautner et al., 1993). Educational programs are usually more effective when offered to asthmatic patients with high morbidity (Boulet, 1998). Intensive programs were found to improve forced expiratory volume in one second (FEV1), and Peak expiratory flow (PEF), nonspecific bronchial hyperresponsiveness, and health-related quality of life (Kauppinen et al., 1999).

The objective of the ideal asthma education program is to improve self-management skills for both the prevention and treatment of asthma and to help families in decision making while encouraging them to work closely with the physician to resolve management problems (Feldman, 1987). Studies have shown that simple information programs are ineffective in improving self-management or reducing asthma morbidity (Van Asperen et al., 1986; Hilton et al., 1986).

In the absence of a patient education process, individuals are often unaware that they have asthma and that it is possible to overcome the disease and conduct a normal life. (Rubinfeldet al., 1988; Buston and Wood, 2000). They remain unprotected from exposure to known allergens, ignore warning signs of asthma attack, incorrectly evaluate the severity of the disease, and either fail to take prescribed medications (Cramer et al., 1991; Rubinfeld et al., 1988; Horn et al., 1990), or do so incorrectly (Rubinfeld et al., 1988).
Importance of yoga

The word “yoga” comes from a Sanskrit root “yuj” which means union, to join and to direct and concentrate one’s attention (Lasater, 1997 and Raub, 2002). Regular practice of yoga promotes strength, endurance, flexibility and facilitates characteristics of self-control, sense of well-being (Collins, 1998). Sustained practice also leads to important outcomes such as changes in life perspective, self-awareness and an improved sense of energy to live life fully with genuine enjoyment (Atkinson and Permuth-Levine, 2009). Yoga has been considered the best complementary and alternative medicine by the National Institute of Health (NIH).

Breathing exercises have been used routinely by physiotherapists and other professionals to control hyperventilation symptoms of asthma. (Bruton, 2005) and can be performed as the Papworth method, Buteyko breathing technique, yoga or any other similar intervention that manipulates the breathing pattern. (Ram, 2003).

Yoga is an ancient Indian way of life; an alarming awareness was observed in health and natural remedies among people, which has also been proven as an effective method for improving health and change in mental attitude. The practice of specific techniques such as yoga asanas (postures), breathing practices (pranayamas), and meditation helps to attain the highest level of consciousness.
Yoga is a set of principles and practices designed to promote health and well-being through the interaction of body, breath and mind (Hayes M, 2013). It enhances positive affect and reduce negative affect to increase lung functions and reduce usage of bronchodilator in asthmatics.

Yoga is a psycho-somatic-spiritual discipline for achieving union and harmony between our mind, body, and soul and the ultimate union of our individual consciousness with the universal consciousness. Pranayama is derived from two Sanskrit words, namely, pranas, which means vital force or life energy, ayama means to prolong. Yoga is a set of principles and practices designed to promote health and well-being through the integration of body, breath and mind. (Hayes, 2013)

Yoga practices might be interacting with various, somato-neuroendocrine mechanisms and it can be used as psychophysiologic stimuli to increase endogenous secretion of melatonin, which improves the sense of well-being. By reducing perceived stress and anxiety, yoga easing respiration and it can be beneficial in the prevention and cure of diseases.

Prana is the energy, when the self-energizing force embraces the body with extension and expansion and control, it is pranayama. It may affect the milieu at the bronchioles and the alveoli particularly at the alveolo-capillary membrane to facilitate diffusion and transport of gases. It may also increase oxygenation at tissue level.
Pranayama practices, stretches the lung tissue producing inhibitory signals from action of slowly adapting receptors and hyperpolarising currents. These inhibitory signals coming from cardiorespiratory region are believed to synchronize neural elements in the brain leading to changes in the autonomic nervous system; and a resultant condition characterized by reduced metabolism and parasympathetic dominance.

Pranayama modifies various inflatory and deflatory lung reflexes and interact with central neural element to bring new homeostasis in the body. Yoga is taught in eight steps, out of which pranayama deals with control of breathing.

Pranayama has four objectives.: a stepwise reduction in breathing frequency, attainment of a 1:2 ratio for the duration of inspiration and expiration, a breath holding period at the end of inspiration that lasts twice the length of expiration, and mental concentration on breathing. (Antoni Virendra Singh, 1990).

Dr. John Harvey, from the British Thoracic Society, said:” The Benefits of yoga, or any other relaxation techniques, are additional to the benefits of conventional drug treatment, and it is vital that patients continue to take their prescribed medication”.

Davendra Kumar Taneja et al (2014) Individual studies report the beneficial effect of yoga in these conditions, indicating that it can be used as non pharmaceutical measure or complement to drug therapy for the treatment of these
conditions. An analytical look at the rungs and the goal of yoga shows that it is a holistic way of life leading to a state of complete physical, social, mental, and spiritual well-being and harmony with nature. Yoga improved the quality of life (QOL), reduced rescue medication use in bronchial asthma, and achieved the reduction of medicines earlier than conventional treatment alone (British wheel of yoga, 2013). Yoga encompasses such a broad range of routines, individuals suffering from asthma are thus offered a range of alternatives with which to incorporate into their lifestyles- depending on their personal preferences.

The goals defined by the global Initiative of Asthma (GINA 2004) includes:

- Minimal symptoms during day and night
- Minimal symptoms during exercise
- Minimal need for reliever medications
- No exacerbations
- No limitations of physical activity
- Maintaining pulmonary function as close to normal as possible
- Minimal side effects of asthma medications
- Prevent development of irreversible airflow obstruction
- Prevent asthma related mortality

“A calm mind produces regular breathing and a relaxed body” (Sheng, 2007). In the case of asthma, therapeutic yoga can increase lung capacity and reduce stress and maximizing the activities of daily living and reduces mortality. (Parker-Pope, 2002)
Motivation for the study

As mentioned earlier, there is a limited data available from the Indian sub-continent on quality of life, disability and impairment of patients with asthma. This limitation is more pronounced in South-India. This underlines the need for this study setting to be based in Sri Ramachandra Hospital in Chennai.

In a survey conducted by the investigator of patients attending the Chest and TB OPD in Sri Ramachandra Hospital, 75 % of patients were found to suffer from the Intermittent to moderate persistent type of asthma and falls into partially controlled and uncontrolled levels of asthma control.

Based on the available literature and background research this investigator decided to look into the quality of life of patients with asthma using the Asthma Quality of life questionnaire. It is not just aimed to investigate the quality of life but the effect of education and yoga on their severity, asthma control and pulmonary functional measures. This investigator also postulated that based on the available literature that poor symptom management could possibly worsening symptoms and affect the quality of life among patients with asthma.

Learning is the addition of new knowledge and experience interpreted in the light of past knowledge and experience. Teaching and learning is an integral part of Nursing. Nurses have the responsibility to educate patients related to various aspects and keep themselves updated. Various teaching strategies are used to increase knowledge, such as lecturing, demonstration, discussion and self-education. These methods of self-education has an advantage over the others as
the learner can educate himself at his own pace and it also stresses on reading (J Assoc Physicians India, 2009).

Activity is not only a perfect way to be in good shape and enjoy health but also to keep good mental health. Hence Yoga it is important to develop a positive attitude towards physical activity in a patient with bronchial asthma.

Not many studies have been conducted by combining educational tools, yoga and self-monitoring using peak flow meter at home. So, the study proposed to explore the added benefit of educational tools, yoga and self-monitoring as impact factors in the management of asthma. Hence, the investigator attempted this study to implement the measures to improve the quality of life of asthmatic patients in this parts of the world. The uniqueness of the study is combining patient education material and yoga along with regular medications in the study group which also self-monitored itself by a peak flow meter every day.

According to ACAAII, prevention is always the best strategy in controlling asthma symptoms (Arlington et al., 2014). WHO(2005) recognizes asthma as a disease of major public health importance and plays a unique role in the co-ordination of international efforts against the disease. Hence the investigator has taken a small effort to increase public awareness of the disease to make sure patients recognize the disease and are aware of the severity of associated problems.
Thus in a nutshell, education and yoga can be incorporated as part of lifestyle measures in promoting health and thereby maximising the quality of life.

1.3 Statement of the Problem

A study to determine the effectiveness of Integrated Approach of educational tools and yoga in the overall outcome among patients with Bronchial asthma attending outpatient services at a Tertiary care hospital.

1.4 Objectives of the Study

1. Determine the effect of Integrated Approach on knowledge, attitude and self-efficacy, asthma control, pulmonary functional measures and Quality of Life among patients with bronchial asthma of both study and control group.

2. Correlate knowledge, attitude and self-efficacy, asthma control, pulmonary functional measures, and Quality of life among patients with bronchial asthma of both study and control group.

3. Associate the level of knowledge, attitude and self- efficacy, asthma control, pulmonary functional measures and quality of life with selected demographic variables of both study and control group.
1.5 Operational Definitions

Effectiveness

Expected result after the implementation of Integrated Approach on knowledge, attitude and self-efficacy, asthma control, pulmonary functional measures and Quality of life.

Integrated Approach

A combination of education on disease process for 15 minutes to a study group of 3-5 participants and demonstration by the investigator cum return demonstration by the study participants on yogic techniques namely Nadishudi Pranayama, Gomukhasana, Savasana on day 1 and Bhastrika pranayama, Bhunjangasana and Tadasana on day 3 for 30 minutes to a study group, and issuing booklet on Wheezer’s anonymous along with that diary on symptom monitoring, peak flow monitoring and yoga practice checklist prepared by the investigator to practice by the participants every day. The teaching was on asthma, triggers, pathophysiological, signs and symptoms, management and life style modification measures, regular follow-up and seeking assistance in emergencies. The participants were reinforced during first and subsequent visits.

Knowledge

The awareness of disease process of bronchial asthma which includes definition, causes, clinical features, management process as determined by the response given by them for the Knowledge, Attitude and Self-efficacy Asthma Questionnaire (KASE- AQ).
**Attitude**

The approach towards practice of yogic techniques and the willingness to cooperate with the investigator in managing asthma as determined by the response given by them for the Knowledge, Attitude and Self-efficacy Asthma Questionnaire (KASE-AQ).

**Self-Efficacy**

The perceived ability to control the symptoms of asthma as measured by Knowledge, Attitude and Self-efficacy Asthma Questionnaire (KASE-AQ).

**Pulmonary functional measures**

A summary of findings on the Pulmonary Function Test (PFT) parameters representing characteristics of the lung function namely FVC, FEV1 etc., as an objective observation by performing spirometry in accordance with the equation by European Community for Coal and Steel (ECCS).

**Asthma control**

The ability to control their symptoms, decrease the medication use as responded by the patient in Asthma Control Questionnaire (ACQ).

**Quality of Life (QOL)**

The overall well-being in relation to the health in different aspects symptoms, activity limitations, emotional function and environmental stimuli as measured using Asthma Quality of Life Questionnaire (AQOL).
1.6 Hypotheses

**H1:** There will be a significant difference in knowledge among subjects who attend the integrated approach than those who do not.

**H2:** There will be a significant difference in attitude among subjects who attend the integrated approach than those who do not.

**H3:** There will be a significant difference in self-efficacy among subjects who attend the integrated approach than those who do not.

**H4:** There will be a significant difference in asthma control among subjects who attend the integrated approach than those who do not.

**H5:** There will be a significant difference in pulmonary functional measures among subjects who attend the integrated approach than those who do not.

**H6:** There will be a significant difference in quality of life among subjects who attend the integrated approach than those who do not.

1.7 Assumptions

- Bronchial asthma symptoms and the medications profoundly affects health related quality of life.
- Knowledge influences health promoting behaviour.
- Education improves better coping and quality of life.
- Yoga helps to reduce the severity of symptoms.
- Reinforcement brings change in their behaviour.