CHAPTER - III
METHODOLOGY

The study was designed to determine the effectiveness of integrated approach of educational tools and yoga in the overall outcome among patient with bronchial asthma attending outpatient services at a tertiary care hospital. This chapter deals with the research design, setting of the study, population, sample, sample size, sampling technique, sample selection criteria, administration and scoring procedure of the tools, content validity and reliability of the tools, pilot study, data collection procedure and statistical analysis used for the study.

3.1 Research Design

A quantitative research with evaluative approach was used. The experimental research design adopted was Randomized controlled trial. The study had two arms a study group and a control group. The schematic representation is as follows:

Table 4. Schematic representation of the Research design

<table>
<thead>
<tr>
<th>Group</th>
<th>Pre test</th>
<th>Intervention</th>
<th>Post test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1st day</td>
<td>3rd day</td>
<td>I</td>
</tr>
<tr>
<td>Study</td>
<td>*O₁X</td>
<td>* X © ≠</td>
<td>*O₂</td>
</tr>
<tr>
<td>Control</td>
<td>*O₁</td>
<td>*</td>
<td>*O₂</td>
</tr>
</tbody>
</table>

* © ≠ after post test III - X ©
Key

R - Block Randomization of patient with bronchial asthma to the study and control group.

O₁ - Pre test assessment of demographic variables, Knowledge, Attitude and Self efficacy Asthma Questionnaire (KASE-AQ), Pulmonary Functional Measures (PFM), Asthma Control Questionnaire (ACQ), Quality of life Questionnaire (AQLQ) on the first day.

X - **Intervention**: Integrated approach - Education on disease process with booklet and demonstration of Yoga techniques by researcher and supervised return demonstration and self-practice at home. Education on disease process and yoga techniques (Nadishudhi paranayama, Gomukhasana, Savasana) on the day 1 of pretest and other yoga techniques (Bhastrika pranayama, Bhujangasana, Tadasana) on day 3, direct and telephonic reinforcement fortnightly.

* - Routine Care including medications and follow up at chest OPD of Sri Ramachandra Hospital received by the patients with bronchial asthma both in the study and control groups throughout the study.

© - Issue of booklet on “Wheezers anonymous” to the study patients on the 3rd day where symptom, peak flow meter monitoring dairy and yoga performance checklist diaries are attached at the end of the booklet and for the control group on the 180th day after the third post test.

¤ - Issue of peak flow meter on the 3rd day

O₂ - First posttest assessment of KASE-AQ, AQLQ on 30th day.

O₃ - Second posttest assessment of KASE-AQ on 90th day.

O₄ - Third posttest assessment of KASE-AQ,ACQ, AQLQ, Pulmonary functional measures on 180th day.
3.1.1 Manipulation

After the selection of the subjects, integrated approach was implemented by the researcher to the patients with bronchial asthma. The independent variable is integrated approach and the dependent variables are knowledge, attitude and self-efficacy, asthma control, pulmonary functional measures and Quality of life. The independent variable integrated approach is given as the intervention to improve the knowledge, attitude and self-efficacy, asthma control, pulmonary functional measures and Quality of life. The patients were given structured teaching on disease process and importance of practicing yoga as a small group of 3-5 members in the Chest OPD for 15 minutes. This was followed by demonstration on yoga techniques for 30 minutes which would reduce the symptoms, improve pulmonary function and enhance Quality of life. Teaching was imparted by the researcher, through lecture, discussion and demonstration by using visual aids like booklet, video demonstration. The patients were asked to do the return demonstration and their doubts were clarified. After the demonstration session a booklet on the “Wheezers’s anonymous” in Tamil and English which contained the same information of the teaching was issued.

The patients were taught how to maintain the symptom, peak flow meter reading, and yoga performance diary. The entire session was planned for 30-45 minutes and the patients continued the practices at their home set up. Twice weekly direct and telephonic reinforcement were given. On the 3rd and 6th month the patients were motivated to continue the practices and maintain the diary. The posttest was performed on 1st, 3rd and 6th month.
3.1.2 Control group

The control group patients were patients with asthma who were allotted as a comparison to evaluate the effect of integrated approach. The investigator believed that the control group would serve as a mean to overcome the confounding variables and serve as a good comparison to highlight the effect of manipulation. The researcher completed the assessment at the same time intervals as that of the study group. The control group patients received the routine care during the study period and received the integrated approach after the completion of study period.

3.1.3 Randomization

The samples were selected based on the selection criteria. The investigator used randomization to have a control over the individual and extraneous variables and to secure good comparable groups. Block randomization was adopted using 5 blocks with 50 patients in each block. The patients were randomly assigned to the study and control groups based on the computer generated random allocation list (Appendix - D). The procedure was explained to them and written consent was obtained from them. Thus the allotment of subjects to groups was randomized.

3.2 Variables

Independent Variable

In this research the independent variable refers to integrated approach.

Dependent Variable

The dependent variable refers to Knowledge, attitude and self-efficacy, asthma control, pulmonary functional measures and Quality of life.
Extraneous Variables

The extraneous variables in this study are age, sex, marital status, education, occupation, residence, family monthly income, duration of illness and the use of the rescue medications.

3.3 Setting of the Study

The study was conducted at Chest OPD of Sri Ramachandra Hospital G Block (SRH). SRH G block is a 1175 bedded multispecialty hospital. There is a Chest and TB unit functioning every day. An average of 75-130 patients attend every day out of which 15-20 of the patients have Bronchial asthma.

All the days both old and new patients will be given consultation and with the instructional follow up on the same day every week unless it is an emergency. From the asthma register and with the help of Chest OPD Nurse, patients were consulted, so it was easy for the investigator to select samples, to follow-up and reinforce the study participants on a particular day. The good infra structure facilities available in the OPD enabled the investigator to meet the study and control groups separately.

3.4 Population

In this study the target population refers to the patients with signs and symptoms of bronchial asthma in the same setting. The accessible population for this study included the partially controlled and uncontrolled level of asthma control who attended the Chest and TB OPD of Sri Ramachandra Hospital.
3.5 Sample

The sample consisted of bronchial asthma patients who fulfilled the sampling criteria during the study period. The investigator adopted randomization in assigning the samples to study and control group respectively until the determined sample size was obtained.

3.6 Sample size/Attrition

The sample comprised of 250 bronchial asthma patients equally distributed to both study and control groups. The sample size was determined by the following formula.

\[ n = 2 \left( Z_\alpha + Z_{1-\beta} \right)^2 / \Delta^2 \]

It was determined using power analysis and effect size. The estimated sample size was 220 to achieve a significance of 0.05 and power of 0.8 for 10% improvement in the symptom reduction and pulmonary functions FEV₁, FVC, FEV₁/FVC ratio (Candy Sodhi, 2009). This study involves comparison of two means. The investigator increased the number of subjects to 250 and allotted a sample size of 125 in the study and control groups. During Posttest I the attrition of samples in the study group was 5 and 2 in the control group. The patients did not come for follow up without any reason. Hence these samples were not included in the study. The researcher was unable to control the attritions; there were 120 samples in the study group and 123 samples in the control group. The total number of attrition of samples was 7. During Posttest I, there was an attrition of samples due to various reasons like illness unrelated to intervention, they had gone outstation and irregular follow-up.
3.7 Sampling criteria

A) Inclusion Criteria

Patients who are

- Physician diagnosed asthma
- Met Global Initiatives for Asthma (GINA) criteria
- Minimum of two years since diagnosis and under medical treatment
- Not practicing yoga
- Attends OPD on elective basis.
- Either sex of age between of 21 to 60 years
- Non-smoker
- Able to understand either English or Tamil
- Willing to participate

B) Exclusion Criteria

Patients who has

- Severe airflow limitation (FEV$_1$<60 %)
- History of co-morbid illness (medical, neurologic and psychiatric, orthopaedics)
- Associated chronic respiratory diseases such as tuberculosis, autoimmune lung diseases.
- Not willing to participate.
3.8 Sampling Technique

All the asthma patients with partially controlled and uncontrolled asthma and those met inclusion criteria during data collection were selected. Samples were allotted to the study and control group by using computer generated random allocation number.

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**Assessed for eligibility (N= 320)**

<table>
<thead>
<tr>
<th>Excluded</th>
<th>-</th>
<th>70</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not willing</td>
<td>-</td>
<td>20</td>
</tr>
<tr>
<td>Co-morbidity</td>
<td>-</td>
<td>31</td>
</tr>
<tr>
<td>Severe asthma</td>
<td>-</td>
<td>10</td>
</tr>
<tr>
<td>Practice of yoga</td>
<td>-</td>
<td>09</td>
</tr>
</tbody>
</table>

**Block Randomization (N= 250)**

- Assigned to study group (n-125)
  - Attrition (05)
    - Illness unrelated to intervention
    - Irregular follow-up
    - Had gone outstation
  - Analyzed (n = 120)

- Assigned to control group (n - 125)
  - Attrition (02)
    - Illness unrelated to intervention
    - Irregular follow-up
  - Analyzed (n = 123)

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**Figure 4. Flow chart of Participants’ recruitment**
3.9 Description of the tool

Experts opinion, extensive literature review enhanced utilization of the tool. The tool consisted of the following sections:

3.9.1 Part I: Background variables

Consisted of questions on

a. Demographic variables of patients with bronchial asthma. This includes age, gender, education, marital status, occupation, income, type of family, residence, family history and triggers.

b. Clinical variables includes BMI, Respiratory rate, grades of dyspnea, breath holding time, Spirometry, exacerbations, age of onset, duration of asthma, frequency of hospital visit.

( Appendix- C1)

Scoring and interpretation

No score was allotted. The data were used for descriptive analysis.

Administration

The background variables were answered by the subjects during data collection.

3.9.2 Part II: Knowledge, attitude and self-efficacy Asthma Questionnaire (KASE-AQ)

The Knowledge, attitude and self-efficacy Questionnaire was used to assess asthma patients’ knowledge regarding asthma, their attitudes about their asthma and their self-efficacy regarding their perceived ability to control the disorder. It is a self-administered Likert scale with items to be filled by the study
participants or the investigator as reported by the subjects. The instrument contains Knowledge (20 items), Attitude (20 items) and Self efficacy (20 items). The tool was developed by John A. Winder in the year 1989. It takes 15 minutes to complete the questionnaire. The reliability of the tool is 0.92. Permission was obtained from the author to use the tool. The components of the tool is about the disease process, triggers, clinical features, medical management, patients confidence and the family support during asthma attacks. (Appendix -C2)

Scoring and Interpretation

Knowledge Subscale

The Knowledge subscale contains 20 questions. The total score is 20 and for identifying the level of knowledge the scale was graded into

<table>
<thead>
<tr>
<th>Adequate</th>
<th>: 76 - 100 %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moderately adequate</td>
<td>: 51 - 75%</td>
</tr>
<tr>
<td>Inadequate</td>
<td>: &lt; 50%</td>
</tr>
</tbody>
</table>

Attitude Subscale

Scoring and Interpretation

The Attitude subscale contains 20 questions, a 5-point Likert scale, from “True” to “False”. There are no correct or incorrect responses. It has both positive and negative statements. The positive statements were 1, 5, 11, 14, 17, 20, 25, 31, 39, 43, 44, 48, 51, 53, 56 and the options were scored as 5, 4, 3, 2 and 1. The negative statements were 22, 28, 37, 40, 50 and reverse scoring was used as 1,2,3,4 and 5. Total scores ranged from 20 to 100. The summed up scores indicated higher the score, the more positive the individual’s attitude toward his or her asthma and the more willing and eager the individual is to manage the disorder.
by working in cooperation with the physician. The lower the score, the more pessimistic and uncooperative the individual’s attitude. The total score is 100 and for identifying the level of attitude the scale was graded into

**Very Unfavourable** : 81-100  
**Unfavourable** : 61-80  
**Neutral** : 41-60  
**Favourable** : 21-40  
**Very Favourable** : <20

**Self-Efficacy Subscale**

The Self-efficacy subscale contains 20 questions, a 5-point Likert-type scale, from “True” to “False”. There are no correct or incorrect responses. It has both positive and negative statements. The positive statements were 4, 8, 9, 13, 15, 19, 23, 26, 29, 32, 35, 36, 42, 46, 47, 57, 59, 60 and the options were scored as 5, 4, 3, 2 and 2. The negative statements were 52, 55 and reverse scoring was used as 1, 2, 3, 4 and 5. Total scores ranged from 20 to 100. The summed up scores indicated higher the score, the more confident the individual is in his or her ability to manage and control the asthma. The total score is 100 and for identifying the level of self-efficacy the scale was graded into

**Highly confident** : 81-100  
**Confident** : 61-80  
**Uncertain** : 41-60  
**Somewhat confident** : 21-40  
**Not confident** : <20
3.9.3 Part III Asthma Control Questionnaire (ACQ)

Asthma control questionnaire was used to measure the level of control over the symptoms. This tool is a standardized tool was developed by Elizabeth Juniper in the year 2007 and the reliability of the tool is 0.90. The tool is a rating scale with 7 items, one week recall. For each component the score assigned is from 0-6. Permission was obtained from the author to use the tool (Appendix -C3).

Scoring and Interpretation

Well Controlled : 0 to 13
Partially controlled : 14 to 28
Uncontrolled : 29 to 42

3.9.4 Part IV Pulmonary Functional Measures

Spirometry was done to evaluate the lung function namely Forced Vital Capacity (FVC) in litres, Forced Expiratory Volume at first one second (FEV₁) in litres, ratio of FEV₁/ FVC in Percentage (%) and Peak Expiratory Flow (PEF) in terms of litres / second in accordance with the European Community for Coal and Steel criteria.

3.9.5 Part V Asthma Quality of Life (AQLQ)

Asthma Quality of Life was used to measure a disease-specific health-related quality of life instrument that taps both physical and emotional impact of disease. This tool is a standardized tool developed by Elizabeth Juniper in the year 2003 and the reliability of the tool is 0.90. The tool has 32 items, 2 week recall with 4 components. It takes 4-5 minutes to complete the questionnaire. For each component the score assigned is from 1-7 with higher scores indicating better quality of life. The components are symptom experiences (12), activity limitation...
(11), emotional (5) and environmental stimuli (4). Permission was obtained from the author to use the tool (Appendix -C4).

**Scoring and Interpretation**

<table>
<thead>
<tr>
<th>Impairment</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Severe impairment</td>
<td>32 to 79</td>
</tr>
<tr>
<td>Moderate impairment</td>
<td>80 to 127</td>
</tr>
<tr>
<td>Mild impairment</td>
<td>128 to 175</td>
</tr>
<tr>
<td>No impairment</td>
<td>176 to 224</td>
</tr>
</tbody>
</table>

### 3.9.6 Part VI Yoga practice performance checklist

This was developed for this study by the researcher to measure the practice level. It was applied only to the study group participants. The scale has pre-performance instructions and steps of yoga techniques which includes Nadishudhi pranayama, Bhastrika pranayama, Gomukhasana, Tadasana, Bhujangasana, and Savasana. The details of assessment are as follows:

The scale has pre-performance preparation for yoga and the steps of all six yoga techniques. This is evaluated for 4 days practice. The reliability of the yoga performance checklist is 0.84 (Appendix -C5).

**A total of 6 steps scores include**

<table>
<thead>
<tr>
<th>Step 1-</th>
<th>Pre performance checklist</th>
<th>with a score of</th>
<th>- 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 2-</td>
<td>Nadishudhi pranayama</td>
<td>with a score of</td>
<td>- 8</td>
</tr>
<tr>
<td>Step 3-</td>
<td>Bhastrika pranayama</td>
<td>with a score of</td>
<td>- 4</td>
</tr>
<tr>
<td>Step 4 -</td>
<td>Bhujangasana</td>
<td>with a score of</td>
<td>- 4</td>
</tr>
<tr>
<td>Step 5-</td>
<td>Gomukhasana</td>
<td>with a score of</td>
<td>- 5</td>
</tr>
<tr>
<td>Step 6 -</td>
<td>Tadasana</td>
<td>with a score of</td>
<td>- 5</td>
</tr>
<tr>
<td>Step 7 -</td>
<td>Savasana</td>
<td>with a score of</td>
<td>- 6</td>
</tr>
</tbody>
</table>
Scoring and Interpretation

The total score ranges from 1 to 40. A score of one was given for correct performance of yoga and a score of zero was given for the wrong practice. The checklist was administered by the researcher during 1st, 3rd and 6th month post intervention period. The level of practice was graded and interpreted as follows.

Administration

Yoga techniques practice was administered by the researcher during the Posttest I, II and III and it was applied only to the study group.

- **Satisfactory**: 76-100 %
- **Moderately satisfactory**: 51-75 %
- **Unsatisfactory practice**: <50

3.9.7 Part VII Compliance to Symptom, peak flow monitoring and yoga performance Diary

Symptom, peak flow monitoring and yoga performance diary maintained by the patient by self or with the help of the caregiver. It was developed by the researcher to know the compliance and to know the severity of the illness. The diary is a daily event calendar cum diary issued to the subjects to note their night time wakeup, symptom experiences in morning, wheeze, activity limitation and medication use and peak flow monitoring both in the morning and evening, performance of yoga against which the patient places a tick (√). The direct reinforcement was given during the regular visit to OPD. The study participants maintained dairy throughout the study period (Appendix - C6, C7, and C8).
Scoring and Interpretation

To keep the dairy handy and to avoid the problem of misplacement the dairy three papers were attached at the end of booklet given to the study participants.

Regular: 4 days a week
Irregular: <4 days a week

3.9.7 Validity and reliability of the tool

All the instruments were reviewed for content validity by Medical and Nursing experts; and were pilot tested to assess the usability and ease of administration. Content validity of the tool was obtained from the international and national experts in the field of Pulmonology, General Medicine, Nurse educators, Psychologist, Educationist, Yoga specialist, Yoga physiologist. (Appendix- E). The tools were subjected for reliability tests. The Knowledge, attitude and self-efficacy questionnaire was also translated in to local language by four experts, two Tamil pandits who had fluency in Tamil and two experts with M.A, M. Phil qualification in English. Using combined translation technique (Jones 2001) 2 experts translated to local language and 2 experts translated the tool to English. The translated version was then pre tested on a sample of 40 patients to identify potential problems in data collection and no problem was found.

The Tamil version of Asthma Quality of life Questionnaire and Asthma Control Questionnaire was given by the author herself. The yoga performance checklist reliability was checked using inter rater method. The obtained ‘r’ value for practice score were 0.84 (Positive correlation). Since these tools were found to be reliable and valid, they were used to proceed with the data collection for the
study. The reading level of the instrument was found to be appropriate and easy to understand.

Four experts rated the questionnaire in three point rating scale as not necessary (0), useful (1), and essential (2). All comments were scored to calculate content validity ratio (CVR) and content validity index (CVI) using the following formula (Lawshe 1975).

The CVR is calculated as (a score for individual scale item)

\[
\text{CVR} = \frac{\text{ne} - \text{N}/2}{\text{N}/2}
\]

**Note:** ne = The number of experts who rated an item as essential.

N = The total number of experts.

The CVI is the mean CVR for all retained items.

CVI was calculated from the average score of the four experts, thus CVI of the KASE-AQ was 0.978. The stability reliability of the tool was established by test-retest method at two weeks for 40 samples and the calculated correlation coefficient was 0.81. The equivalence reliability of the tool was established and the Cronbach’s alpha coefficient for this sample was 0.92.

**3.9.8 Information booklet on Bronchial asthma and yoga techniques**

The criteria for content validity of the booklet included with relevance to the content, language, accuracy, feasibility and clarity on a three point rating scale (0- not necessary, 1- useful, 2-essential). Ten experts rated the booklet. The average overall rating for the module was 8.22 for 10 score.
3.9.9 Integrated approach

The strategies included (a) Education and (b) Yoga techniques

3.9.10 Education

It refers to the interactive teaching learning- sessions (Appendix-E). It was designed by the researcher and reviewed by experts in this area. The development of the teaching package was based on an extensive review of literature. Lecture, discussion, demonstration teaching methods were used with various visual aids to add interest and to aid memory. Pilot teaching was performed by the researcher with a group of 40 subjects they were included for the main study, in order to obtain feedback from them about the appropriateness of teaching methodologies that were used. Subjects in this pilot group also helped in determining the understandability of the questionnaire and helped in identifying potential problems.

There were group teaching sessions and each session lasted for 15 minutes. The teaching sessions were carried out by the researcher in the demonstration class room. The objectives and content outline for each session were as follows.

**Session 1: Content outline( Day 1)**

- Review structure and function of the respiratory system
- Explain the pathophysiology, clinical features and management process
- Discuss and clarify myths and misconceptions about bronchial asthma
- Explain self-help and lifestyle measures for managing asthma attacks
- Understand the yoga techniques
- Demonstration of three basic yoga techniques
Session 2: Content outline (Day 3)

- Review about the disease process
- State the importance and benefits of regular yoga practice
- Demonstration of other three yoga techniques by the researcher
- Return demonstration of yoga by the study subjects

3.9.11 Yoga techniques

Table 5. Demonstration of Pranayamas and Asanas

<table>
<thead>
<tr>
<th>Pranayamas</th>
<th>Asanas</th>
<th>Yoga Relaxation</th>
</tr>
</thead>
<tbody>
<tr>
<td>NadiSudhi Pranayama</td>
<td>Bhujangasana</td>
<td>Savasana</td>
</tr>
<tr>
<td>Bhastrika pranayama</td>
<td>Gomukhasana</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tadasana</td>
<td></td>
</tr>
</tbody>
</table>

The subjects were grouped in to small groups of 3-5 and were asked to assemble in the room to start with group yoga session. Yoga practice was given for about 30 minutes on day 1 and day 3. Yoga was practiced every day by the sample at home till the study period. On regular visits to OPD days, as a group session under the researcher’s guidance samples were asked to show return demonstrate and clarify their doubts. During a period of 1, 3 and 6 months, subjects were assessed through yoga performance check list for their level of practice on yoga techniques. Lacunas made during the practice were corrected and reinforced.

3.9.12 Translation of the tool

The tools were translated from English to Tamil version by language experts and it was back translated. The reliability of the translated version was also determined. (Appendix- C1 to C8)
3.9.13 Ethical consideration

The SRU’s Institutional Ethical Committee approved the study. The ethical consideration was based on the Indian Council of Medical Research guidelines of biomedical research in human beings (Appendix-A).

3.10 Pilot study and Revision

The pilot study was conducted at the Chest and T.B OPD of Sri Ramachandra Hospital, Chennai. In order to ensure validity and reliability of the tool and feasibility for giving intervention, the pilot study was conducted. 20% of the sample were selected randomly. Though the pilot study demonstrated feasibility some modifications were done after pilot study analysis findings and also based on the suggestions given by the experts.

The modification done after pilot study were

**Background variable** - the investigator removed religion which was one of the variable for the sample selection as per the ethical committee suggestion.

**Duration of the study** - Post assessment of the dependent variables was increased to 6 months from 3 months.

**Sampling technique** - The samples were selected by simple random technique and it has been changed to block randomization.

3.11 Data collection procedure

After obtaining permission to conduct research from Institutional Ethics Committee, Head of the Department of Chest and T.B. to collect the data from the patients with bronchial asthma attending Chest and TB OPD at Sri Ramachandra Hospital, the randomization list was prepared to allocate the
patients to either study and control group. The eligible participants were identified with the assistance of the staff nurses of the Outpatient unit and through perusal of their records. Data were collected during the OPD hours from 9.00 a.m. to 12.30 p.m. every day. Based on the Global Initiatives of Asthma criteria for asthma (2006) and selection criteria the eligible samples were identified. The investigator introduced self to the group, the purposes of the study and their right to participate or withdraw from the study were explained to the patients for obtaining the written informed consent. Such consenting patients who fulfilled the inclusion criteria were enrolled for the study. The subjects were asked not to change their lifestyle during the study and were instructed not to perform any physical exercises if they were not doing the same regularly.

On the first day, following the routine consultation the baseline data on background variables were collected using interview technique by maintaining privacy. Ethical principles were adhered to throughout the study. About 15 – 30 minutes was taken to administer the tool and subjects were asked to mark their response in the Knowledge, attitude and self-efficacy questionnaire and Asthma quality of life questionnaire and based on the subjects opinion, for those who had difficulty in understanding how to score, explanation was provided and their response was obtained for each item. If the sample need assistance, the investigator marked their opinion. The other clinical variables from the patient's case sheet also was recorded during pretest.

The study group received education using booklet and demonstration by the investigator on yoga techniques, the whole session took about 30 minutes and everyday self-practice at home was instituted for the group; Yoga performance
checklist and symptom and peak flow rate monitoring diary were also given to yoga group to assess the level of performance and monitor their symptoms. Fortnightly telephonic reinforcement was done, whereas the control group received only the routine care.

The post test was assessed at 1, 3, 6 months of pretest. Each posttest was followed by reinforcement using booklet teaching and return demonstration by the study group during the regular check-up at OPD.

The control group subjects received routine care only. All subjects were routinely counseled by the treating pulmonologist and the unit nurses. They were provided with usual information on regular visit, diet restriction, activity limitations, do’s and don’ts and follow up. Investigator visited both the groups simultaneously. The booklet on Wheezer’s anonymous was given to the study group to promote healthy life style practices and for the control group booklet was given at the end of the study.
Figure 5. Schematic representation of data collection procedure
3.11.1 Data analysis

Statistical methods used

The collected data was analyzed with R software 3.2.3 version. The study used descriptive statistics including frequency, percentage, mean and standard deviation to assess study related variables (demographic and clinical variables) and describe the dependent variable (knowledge, attitude and self-efficacy, asthma control, quality of life and pulmonary measures and yoga practice). To find the existence of homogeneity between the study and control group the nonparametric test chi-square distribution was used to find the distribution of variables in both the groups.

To test the effect of independent variable (Educational tools and yoga) within the group Wilcoxon Signed rank test was used and to find the effect of integrated approach between groups Mann Whitney U test was used.

KruskallWalli’s test was used to differentiate the study related variable with outcome variables. Spearman’s correlation was applied to assess relationship between outcome variables.

Friedman’s test was applied to find out the effect on repeated measures in different period of the study.
**Table 6: Plan for Data analysis**

<table>
<thead>
<tr>
<th>Methods</th>
<th>Type of statistics</th>
<th>Purposes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Descriptive Statistics</strong></td>
<td><strong>Frequency, Percentage, mean, SD</strong></td>
<td>Assess the sample characteristics and study related variables.</td>
</tr>
<tr>
<td><strong>Inferential Statistics</strong></td>
<td><strong>Chi-square test</strong></td>
<td>Determine homogeneity between the groups.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Associate selected background variables with outcome variables.</td>
</tr>
<tr>
<td><strong>Wilcoxon signed Rank test</strong></td>
<td></td>
<td>Compare the data within the groups.</td>
</tr>
<tr>
<td><strong>Mann Whitney U test</strong></td>
<td></td>
<td>Compare the data between the groups.</td>
</tr>
<tr>
<td><strong>KruskalWalli’s Test</strong></td>
<td></td>
<td>Associate the study related variables with outcome.</td>
</tr>
<tr>
<td><strong>Spearman’s correlation</strong></td>
<td></td>
<td>Identify the relationship between the outcome variables.</td>
</tr>
<tr>
<td><strong>Friedman’s test</strong></td>
<td><strong>RM ANOVA</strong></td>
<td>Compare the data between the groups over a period of time.</td>
</tr>
<tr>
<td><strong>Multivariate Generalized estimating Equation</strong></td>
<td></td>
<td>Evaluate the role of independent variables on the dependent variables.</td>
</tr>
</tbody>
</table>