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## DESCRIPTIVE STUDY TO ASSESS THE SKILL REGARDING MANAGEMENT OF BRONCHIAL ASTHMA AMONG WORKERS IN JK CEMENT FACTORY OF KHREW KASHMIR.

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### Abstract

Substantial epidemiologic and clinical evidence indicates that agents inhaled at work can induce asthma. Deep breathing exercise helps to relieve shortness of breath by preventing air from getting trapped in the lungs and helps inhalation of more fresh air into base of lungs. It may help the client to feel more relaxed and centered. Breathing exercises may reduce the amount of medication the client need to keep asthma symptoms under control. However there are different types of non-pharmacological therapies and alternatives which, includes acupuncture, breathing exercises, chiropractic manipulation, diet, vitamins and supplements, herbal remedies, massage and relaxation techniques. Based on the problem selected and objectives of the study, a descriptive research design was selected to assess the skill (deep breathing exercise) regarding management of bronchial asthma among workers in JK cement factory of Khrew Kashmir. Fifty workers were selected in JK cement factory of Khrew Kashmir by total enumerative sampling technique for this study. Observational checklist and interview schedule was used for data collection and was analysed by descriptive and inferential statistics using chi-square and t-test. The findings revealed that pre-test mean score was 1.34, median 1.17 SD .358 at  $p \leq 0.05$ . The findings also revealed that no association of pretest skill score was found with age, Educational status and duration of exposure at ( $p \leq 0.05$ ). The findings of the study concluded that the pretest assessment was not satisfied in terms of skill and practice which emphasis that there is need to educate workers of cement factories regarding deep breathing exercise which can help them to become more aware and can increase level of skill about the management of bronchial asthma.

**Key words**

Assess skill, deep breathing exercise, Bronchial asthma, management and workers of cement factory.

## 1. INTRODUCTION

The lungs within their combined alveolar surface area of around 140 m are directly open to the external environment. Thus structural, functional or microbiological changes within the lungs can be closely related to epidemiological, environmental, occupational, personnel and social factors. Primary respiratory diseases are responsible for a major burden of morbidity and untimely deaths. In addition the lungs are often affected in multisystem diseases.<sup>1</sup>

The main role of the respiratory system is to extract oxygen from the external environment and dispose of waste gases, principally carbon dioxide. This requires the lungs to function as efficient bellows, bringing in fresh air and delivering it to the alveoli, and expelling used air at an appropriate rate. Gas exchange is achieved by exposing thin-walled capillaries to the alveolar gas and matching ventilation to blood flow through the pulmonary capillary bed. In doing this, the lungs expose a large area of tissue, which can be damaged by dusts, gases and infective agents. Host defense is therefore a key priority for the lung and is achieved by a combination of structural and immunological defenses.<sup>2</sup>

Asthma occurs in more than 10% of British adults, and bronchial carcinoma is the most common fatal malignancy in the developed world. The lung is the major site of opportunistic infection in those immune compromised by the acquired immunodeficiency syndrome (AIDS) or by anti-allograft and anti-cancer chemotherapeutic regimes; and tuberculosis (including multiple drug resistant strains) continues to increase, infecting one-third of the world's population.<sup>1</sup>

A number of important research advances have occurred in recent years. Greater understanding of the genetics and cell biology of the lung has opened the way to noble therapies, including treatments targeting inflammatory mechanisms and the possibility of airway delivered gene therapy for cystic fibrosis. Finally recent advances in our understanding of the cellular and molecular mechanisms underlying diseases such as asthma and the acute respiratory distress syndrome (ARDS) are likely to lead to rational mechanism based therapy within the foreseeable future.<sup>1</sup>

Bronchial asthma and chronic obstructive pulmonary disease (COPD) are common conditions and are the dominating obstructive airway diseases in the general population.<sup>3</sup>

Asthma is a common long term inflammatory disease of the airways of the lungs.<sup>4</sup> Occupational asthma is a chronic inflammatory disorder in which there is generalized obstruction of the airways usually reversible caused by a particular occupational environment especially by inhalation of a substance or a material that a worker manufactures or uses directly or is incidentally present at worksite.<sup>(5, 6, 7, 8)</sup>

Classically asthma has three characteristics: (1) Airflow limitation which is usually reversible spontaneously or with treatment. (2) Airway hyper responsiveness to a wide range of stimuli. (3) Bronchial inflammation with T lymphocytes, mast cells, eosinophils with associated plasma exudation, edema, smooth muscle hypertrophy, matrix deposition, mucus plugging and epithelial damage.<sup>2</sup>

Diagnosis is usually based on the pattern of symptoms, response to therapy over time, and spirometry.<sup>9</sup> Asthma is classified according to the frequency of symptoms, forced expiratory volume in one second (FEV1), and peak expiratory flow rate.<sup>10</sup> It may also be classified as atopic or non-atopic where atopy refers to a predisposition toward developing a type 1 hypersensitivity reaction.<sup>11,12</sup>

Occupational asthma is a lung disorder in which substances found in the workplace cause the airways of the lungs to swell and narrow. This leads to attacks of wheezing, shortness of breath, chest tightness, and coughing. Asthma is caused by inflammation (swelling) in the airways of the lungs. When an asthma attack occurs, the lining of the air passages swells and the muscles surrounding the airways become tight. This reduces the amount of air that can pass through. In persons who have sensitive airways, asthma symptoms can be triggered by breathing in substances called triggers. Many substances in the workplace can trigger

asthma symptoms, leading to occupational asthma. The most common triggers are wood dust, grain dust, animal dander, fungi, or chemicals.<sup>13</sup>

Global Initiative for Chronic Obstructive Lung Disease demonstrated the need for more studies in 2014 using the randomised control trial design, especially on breathing control exercises but also on the different techniques of respiratory muscle training, before conclusive high-quality systematic reviews can be performed. According to the AMSTAR criteria, three were of high quality (two on respiratory muscle training and one on pursed-lip breathing, diaphragmatic breathing, yoga breathing), three were of moderate quality (respiratory muscle training), and one was of low quality (pursed-lip breathing). In the high-quality systematic reviews, positive effects of performing inspiratory muscle training on breathlessness and quality of living as well as on fatigue were found in one systematic review. Also one high-quality systematic review reported a positive effect on breathlessness of performing pursed-lip breathing.<sup>14</sup>

Saxena T, Saxena M conducted a comparative research design in 2009 studied the effect of breathing exercises (pranayama) in patients with bronchial asthma of mild to moderate severity. Fifty cases of bronchial asthma (Forced Expiratory Volume in one second (FEV1) > 70%) were studied for 12 weeks. Patients were allocated to two groups: group A and group B (control group). Patients in group A were treated with breathing exercises (deep breathing, Brahmari, and Omkara, etc.) for 20 minutes twice daily for a period of 12 weeks. Patients were trained to perform Omkara at high pitch (forceful) with prolonged exhalation as compared to normal Omkara. Group B was treated with meditation for 20 minutes twice daily for a period of 12 weeks. Subjective assessment, FEV1%, and Peak Expiratory Flow Rate (PEFR) were done in each case initially and after 12 weeks. Breathing exercises (pranayama), mainly expiratory exercises, improved lung function subjectively and objectively and should be regular part of therapy.<sup>15</sup>

Marjolein L, Bruurs J, Lianne J, Giessen V, Moed H conducted a systematic Cochrane review in 2013 on breathing exercises (BE), inspiratory muscle training (IMT), physical training (PT) and airway clearance in patients with asthma. The search resulted in 237 potentially relevant articles, after exclusion 23 articles remained. BE (n = 9) may improve disease specific quality of life, reduce symptoms, hyperventilation, anxiety and depression, lower respiratory rate and medication use. IMT (n = 3) can improve inspiratory pressure and may reduce medication use and symptoms. Physical training PT (n = 12) can reduce symptoms, improve quality of life (QOL) and improve cardiopulmonary endurance and fitness. In conclusion, physiotherapy may improve quality of life, cardiopulmonary fitness and inspiratory pressure and reduce symptoms and medication use. Further studies, investigating combinations of techniques, are needed to confirm these findings.<sup>16</sup>

Global Initiative for Chronic Obstructive Lung Disease developed a census report 2014 on breathing control exercises and different techniques of respiratory muscle training, before conclusive high-quality systematic reviews can be performed. According to the assessment of multiple systematic reviews criteria, three were of high quality (two on respiratory muscle training and one on pursed-lip breathing, diaphragmatic breathing, yoga breathing), three were of moderate quality (respiratory muscle training), and one was of low quality (pursed-lip breathing). In the high-quality systematic reviews, positive effects of performing inspiratory muscle training on breathlessness and quality of quality as well as on fatigue were found in one systematic review. Also one high-quality systematic review reported a positive effect on breathlessness of performing pursed-lip breathing. According to the authors of the systematic reviews, the single randomized control trials included were of variable quality, indicating that more studies are needed. In the low-quality systematic review and the moderate-quality systematic reviews, it has been difficult to fulfill the assessment of multiple systematic review criteria, due partly, for instance, to the small number of randomized control trial based studies, not including all languages, and not performing publication-biased analysis. Recommended guidelines for writing a systematic review should be followed in order to provide high-quality reviews.<sup>17</sup>

Thomas M, Mcklinley RK, Freeman E, Foy C, Prodger P, Price D conducted a pre experimental study in 2003 to determine the effectiveness of physiotherapy based breathing retraining for patient with asthma on 33 adult patients with diagnosed and currently treated with asthma. The result concluded that the patient who have symptoms of dysfunctional breathing shows a clinically relevant improvement in quality of life following with physiotherapy based breathing intervention.<sup>18</sup>

Copper S, Osborne J, Newton S, Harrison B conducted a pre experimental study in 2003 the find the effect of two type breathing exercise 90 patient with asthma taking inhaled corticosteroid were randomized after one two week run in period to buteyko and pranayama exercise. The result showed that breathing exercise technique improves respiratory function and reduce the use of bronchodilator.<sup>19</sup>

Mancuso AC, Choi NT, Westermann H, Wenderoth S, Wells TM, Charlson EM Conducted a cross sectional study in 2013 to assess longitudinal asthma status in 256 primary care patients in New York City enrolled in a trial to increase lifestyle physical activity. Patients were randomized to two protocols to increase physical activity during a period of 12 months. At enrollment, patients completed the Asthma Quality of Life Questionnaire and the Asthma Control Questionnaire and received asthma self-management instruction through an evaluative test and workbook. Exercise and self-management were reinforced every 2 months. The asthma quality of life questionnaire asthma was repeated every 4 months and the asthma quality of life asthma control questionnaire ACQ was repeated at 12 months. The study revealed that mean age was 43 years and 75% were women. At 12 months there were clinically important increases in physical activity with no differences between groups; thus, data were pooled for asthma analyses. The enrollment asthma quality of life questionnaire score was  $5.0 \pm 1.3$  and increased to  $5.9 \pm 1.1$  corresponding to a clinically important difference. Correlations between asthma quality of life questionnaire and physical activity were approximately 0.35 ( $p < .0001$ ) at each time point. In a mixed effects model, the variables associated with improvement in asthma quality of life questionnaire asthma quality of life questionnaire scores over time were male sex, less severe asthma, not taking asthma maintenance medications, fewer depressive symptoms, and increased physical activity (all variables,  $p < .03$ ). According to the asthma control questionnaire asthma was well controlled in 38% at enrollment and in 60% at 12 months ( $p < .0001$ ).<sup>20</sup>

Jeebhay MF, Quirce S conducted a cross sectional study in 2007 on Occupational asthma among lung disease after pneumoconiosis in developing countries. The median proportion of adult cases of asthma attributable to occupational exposure is between 10% and 15%. The population attributable fraction appears to be similar in industrialised and developing countries characterized by rapid industrialization (13-15%), but lower in less industrialized developing countries (6%). The reported mean annual incidence of occupational asthma in developing countries is less than 2 per 100 000 population, compared to very high rates of up to 18/100 000 in Scandinavian countries. While occupational asthma remains under-recognized, especially in developing countries, it remains poorly diagnosed and managed and inadequately compensated worldwide. Appropriate treatment remains early removal from exposure to ensure that the worker has no further exposure to the causal agent, with preservation of income. However, up to one third of workers with occupational asthma continue to remain exposed to the causative agent or suffer prolonged work disruption, discrimination and risk of unemployment.<sup>21</sup>

Manjula R, Praveena R, Rashmi R, Clevin, Ghattargi CH, Dorte AS et al conducted a retrospective cohort study in 2013 to find the morbidity profile of the cement factory workers in North Karnataka on chronic exposure to Portland cement dust that lead to greater prevalence of various clinical conditions (includes both respiratory and non-respiratory). These conditions are consistently associated with the degree and duration of exposure. Regular use of appropriate personal protective equipment at the work site could protect the cement factory workers from adverse health effects. Data was collected using predesigned questionnaire by personal interview method and clinical examination. 64 male workers were randomly selected who were working in various departments like crushing, raw/cement mill, rotary kiln and packing department. Equal number of unexposed controls was selected from the area at least 5 kms from the factory and those who are not exposed to cement dust in the past, were matched for age, Socio economic status and smoking with the exposed population. The findings revealed that among exposed workers 36% were employed in Crushing department, 25% each in Packing and cement/raw mill. Systolic and Diastolic blood pressure was found to be higher among the exposed, which was statistically high significant ( $p < 0.001$ ). There was significant increase in weight among exposed ( $p < 0.001$ ). Maximum 29(45.3%) of the workers had stuffy nose and epistaxis when compared to unexposed with Relative risks of 2.6, followed by Dermatological complaints and lower respiratory complaints with Relative risk of 2.18 and 2.3 respectively.<sup>22</sup>

## 2. OBJECTIVES OF THE STUDY

- To assess the pre-test skill score regarding deep breathing exercise among workers in JKcement factory of Khrew Kashmir.
- To find the association between pre-test skill score regarding deep breathing exercise among workers in JK cement factory of Kashmir with demographic variables {age, educational status and duration of exposure}.

## 3. MATERIALS AND METHODS

A descriptive research design was conducted to assess the skill regarding management of bronchial asthma among workers in JK cement factory of Khrew Kashmir. Only fifty subjects were selected by total enumerative sampling technique. The tool consisted of demographic variables, Observational checklist and self-structured interview schedule for data collection. Prior to data collection informed consent was obtained from the participants. The data was analysed by using descriptive and inferential statistics.

## 4. RESULTS

**Table No. 1: Frequency and percentage distribution of Study subjects according to their age.**

N=50

Age in years	Study Subjects	
	Frequency	Percentage
0-20	27	54
21-40	17	34
41-60	6	12

The data presented in table 1 revealed that out of 50 study subjects most of the subjects were 27 (54%) in the age group of 0-20 years, 17 (34%) in the age group of 21-40 years and 6 (12%) in the age group of 41-60 years.

**Table No. 2: Frequency and percentage distribution of Study subjects according to their education.**  
N=50

Educational Status	Study Subjects	
	Frequency	Percentage
Illiterate	28	56
Primary	16	32
Middle & above	6	12

The data presented in table 2 revealed that out of 50 study subjects 28(56%) were illiterate, 16 (32%) were primary and 6 (12%) were middle pass and above.

**Table No 3: Frequency and percentage distribution of Study subjects according to their duration of exposure.**  
N=50

Duration of exposure	Study Subjects	
	Frequency	Percentage
0-10	14	28
11-20	21	42
21-30	15	30

The data presented in table 3 revealed that out of 50 study subjects 14(28%) had 0-10 years duration of exposure, 21 (42%) had 11-20 years duration of exposure and 15 (30%) had 21-30 years duration of exposure.

**Table No. 4: Mean, Median, Standard Deviation and Range of skill Score (deep breathing exercise) of subjects regarding management of bronchial asthma.**

N=50						
Skill Score	Mean	Median	Standard Deviation	Minimum Score	Maximum Score	Range
Pre-test	1.34	1.17	.358	0	2	1

The data presented 4 revealed that pre-test mean skill score of study subjects was 1.34, median was 1.17, standard deviation was .358 and minimum score was 0, maximum score was 2 and range was 1 at  $p \leq 0.05$ .

**Table No. 5: Association between pre-test skill score regarding management of bronchial asthma with demographic variables (age, educational status and duration of exposure).**

Parameter	Category	N	Poor	Average	Good	Chi-square	df	p-value	Result
Age	0-20	27	17	10	-	2.93	2	.23	NS
	21-40	17	7	10	-				
	41-60	6	2	4	-				
Educational status	Illiterate	28	16	12	-	2.16	2	.33	NS
	Primary	16	6	10	-				
	Middle & above	6	4	2	-				
Duration of work	0-10	14	8	6	-	1.23	2	.53	NS
	11-20	21	12	9	-				
	21-30	15	6	9	-				

The data presented in the table 5 revealed that no significant association was found between age, educational status and duration of exposure of study subjects with their pre-test skill score ( $p \geq 0.05$ ). Hence the investigator fully accepted the null hypothesis ( $H_0$ : There is no significant association between pre-test skill score of subjects with these variables e.g. age, educational status and duration of exposure).

## 5. DISCUSSION

The major findings of the study were compared with the similar studies conducted by other researchers. The findings of the study were discussed as per the objectives and hypotheses. The findings of the study showed that in pre-test out of 50 study subjects majority of the subjects were 27 (54%) in the age group of 0-20 years, 17 (34%) in the age group of 21-40 years and 6 (12%) in the age group of 41-60 years.

The findings also revealed that majority of the study subjects 28(56%) were illiterate, 16 (32%) were primary and 6 (12%) were middle pass and above.

The findings also portrayed that out of 50 study subjects 14(28%) had 0-10 years duration of exposure 21 (42%) had 11-20 years duration of exposure and 15 (30%) had 21-30 years duration of exposure.

The findings revealed that in pre-test out of 50 study subjects 50 (100%) had poor skill, and none of them had neither average nor good skill regarding deep breathing exercise for management of bronchial asthma among workers in JK cement factory of Khrew Kashmir in control group.

The present study findings are consistent with the findings of experimental research design conducted by Prasanna KB, Sowmiya KR, Dhileeban CM<sup>23</sup> in 2015 to assess the effectiveness of deep breathing exercise

among asthmatic patients in medical college Chennai Tamil Nadu India. The findings of study revealed that none the subjects had good knowledge, 12 (24%) had average knowledge and 38 (76%) had poor knowledge regarding deep breathing exercise.

The findings also revealed that pre-test mean skill score of study subjects was 1.34, median was 1.17, standard deviation was .358 and minimum score was 0, maximum score was 2 and range was 1 at  $p \leq 0.05$ . The present study findings are consistent with the findings of quantitative research design conducted by Chithra RA, Raju J<sup>24</sup> in 2017 to assess the effect of structured teaching program on knowledge regarding respiratory therapy among the patients with respiratory disorders Rajasthan India. The findings of the study revealed that the mean post-test skill score  $23.52 \pm 2.65$  at  $P < 0.0001$  of STP was apparently higher than the mean pre- test skill score  $5.88 \pm 1.54$  at  $P < 0.0001$  respectively with mean difference 17.64. Therefore it could be concluded that structured teaching programme is effective in gaining skill score regarding management of bronchial asthma.

The findings of the present study are in conformity with the findings of an experimental research design conducted by Prasanna KB, Sowmiya KR, Dhileeban CM<sup>23</sup> in 2015 to assess the effectiveness of deep breathing exercise among asthma patients in Chennai, Tamil Nadu, India. The findings of the study revealed that the mean post-test skill score  $291.8 \pm 73.309$  at  $P < 0.0001$  of STP was apparently higher than the mean pre- test skill score  $209.4 \pm 66.59$  at  $P < 0.0001$  respectively with mean difference 82.4. Therefore it could be concluded that structured teaching programme is effective in gaining skill score regarding management of bronchial asthma.

The association of demographic variables with pretest knowledge scores by using Chi – square test revealed that there is no statistically significant association between pretest knowledge score with selected demographic variable as age, educational status and duration of exposure.

The present study findings are consistent with the findings of a quantitative research design conducted by Chithra RA, Raju J<sup>24</sup> in 2017 to assess the effect of structured teaching program on knowledge regarding respiratory therapy among the patients with respiratory disorders (asthma) Rajasthan India by using chi square test revealed that there was statistically no significant association between pretest knowledge score with selected demographic variable as age and education.

The findings of the present study are in conformity with the findings of an experimental research design conducted by Prasanna KB, Sowmiya KR, Dhileeban CM<sup>23</sup> in 2015 to assess the effectiveness of deep breathing exercise among asthma patients in Chennai, Tamil Nadu India by using chi square test revealed that there was statistically no significant association between pretest knowledge score with selected demographic variable as age.

## 6. CONCLUSION

This study was conducted with the objective to assess the skill regarding management of bronchial asthma among workers in JK cement factory of Khrew Kashmir. The findings concluded that majority of the study subjects were not having good practice and skill regarding deep breathing exercise. The findings also revealed that there was no significant association between pretest knowledge score with these demographic variables (age, educational status and duration of exposure). So it indicates that there is need to enhance the skill regarding deep breathing exercise among occupational workers.

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## 8. CONFLICT OF INTEREST AND FUNDING

As such there was a bit conflict and compromise between the workers and investigator because the workers were not ready to cooperate while doing pre-assessment on deep breathing exercise regarding management of bronchial asthma. Moreover, the investigator first motivated the cement workers regarding the benefits of this skill and study. In addition of this, the fact is that workers remain very busy in factories and are getting very less time to achieve such type of opportunities during their life. The investigator also felt that there should be planned teaching programmes, awareness programmes, demonstrations in order to enhance the level of skill for occupational workers. The investigator also done this work very ethically without getting any fund or any support from any organization.

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