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Research Article

**INCIDENCE OF CHRONIC OBSTRUCTIVE PULMONARY  
DISEASE AS OCCUPATIONAL LUNG DISEASE AMONGST  
BRICK KILN WORKER**Dr Muhammad Jahanzaib Sabeeh<sup>1</sup>, Dr Kainat Liaqat<sup>2</sup>, Dr Hafiz Ahmad Sami<sup>3</sup><sup>1</sup> University College of Medicine and Dentistry, The University of Lahore<sup>2,3</sup> Akhtar Saeed Medical and Dental College, Lahore

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**Abstract:**

**Aim:** To determine the frequency of chronic obstructive pulmonary disease as occupational lung disease among brick kiln workers and to compare the frequency of chronic obstructive pulmonary disease among brickyard workers and the surrounding population.

**Study design:** Comparative study - cross-sectional (analytical).

**Place and duration of the study:** Jinnah Hospital, Lahore from March 2019 to March 2020.

**Methods:** This was a Comparative - cross sectional (analytical) study conducted on 407 kiln workers and 407 non kiln workers.

**Results:** The average age of participants was 35 years. The main symptoms in the study group (57% v / s 6%) were cough, (33% v / s 3%) sputum and (14% v / s 1%) dyspnea. Spirometric results showed that chronic obstructive pulmonary disease (18, 9% v / s 2.6%,  $p < 0.01$ ) in brick kiln workers compared to controls living within five kms away from kiln.

**Conclusion:** Brick kilns workers have a higher risk of developing chronic obstructive pulmonary disease (18.9% v / s 2.6%) than controls living outside the brick industry.

**Key words:** occupational risk, chronic obstructive pulmonary disease, lung function test.

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**INTRODUCTION:**

Over 1,800 employees are involved in brick kilns in Pakistan. Brick workers are scattered in four Pakistani provinces, mainly because the informal construction sector employs many workers at risk because they are illiterate. Occupational Health and Safety. These employees do not even have protection for other industrial workers, because most labor laws do not apply to this industry. As a result, the rate of accidents, diseases and injuries is much higher. Brick powder mainly causes lung infections, eye allergies, back pain, depression and skin problems. Some estimates are based on occupational injuries and diseases reported in official statistics. However, many injuries and illnesses caused by occupational hazards have not been reported. The ILO and WHO estimate that there may be 250 million accidents at work each year, leading to the deaths of 330,000. Occupational lung disease is the number one work-related disease in the United States in terms of frequency, severity and prevention of this disease. These diseases are often caused by prolonged exposure to irritants or toxic substances that can cause acute or chronic respiratory diseases, but serious individual exposure can also cause chronic lung disease. A total of 2.5 out of 10,000 full-time employees experienced occupational respiratory disease. Occupational lung diseases are often incurable but this can always be prevented. Improving ventilation, wearing protective clothing, changing work procedures and training employees are key prevention factors. Many acute and chronic lung diseases are directly related to the inhalation of harmful substances in the workplace, such as pneumoconiosis, hypersensitive pneumonia, obstructive airway disorders, toxic lung damage, and various lung cancer. diseases However, chronic obstructive pulmonary disease is not properly treated by the health community and government officials. The restriction of airflow is usually progressive and is associated with an abnormal pulmonary inflammatory response to harmful particles or gases. Many hazardous substances in the workplace get into the body through breathing, inhaled materials can directly affect the lungs or they can be absorbed directly from the lungs and affect other parts of the body. The accumulation of particles along the airways depends on many factors, such as particle size, ventilation rate and the presence of the disease. Occupational chronic obstructive pulmonary disease is more common than previously thought, but in many cases specific causes cannot be identified. Adopting safer business practices, improving security systems, and changing behavioral and management practices can reduce the accident rate by 50% or more in a relatively short time, even in high risk industries. short. This was also found in a study on brickyard workers in Luknow, India, which found brickmakers have a high risk of dust-related

diseases. Brick is the main material used in construction. Although the construction, shape and weight of the bricks have undergone numerous historical passages, the production technology has undergone very limited changes. Population growth and economic growth in developing countries around the world are causing greater demand for construction sites and, consequently, cheap building materials. A study of the impact of rural brick factory operations on environmental pollution and workers' health in China reveals that a large amount of fuel is consumed during the firing process, causing severe air pollution and adversely affecting it. in human health. People living near brick kilns are always exposed to pollution, and employees working and living in this area are the riskiest people. Children under 5 years old are most affected. Epidemiological studies in various parts of the world have shown an increase associated with bronchitis, asthma, reduced lung function, pharyngitis, cough, eye irritation, pulmonary fibrosis, emphysema, allergic rhinitis, and low birth weight. atmospheric air degradation. quality. According to various scientific studies, informal companies appear to be more polluting than large companies in the same industry because they do not have pollution control devices. Because the traditional informal brick industry is an important source of employment and is often found in poor residential areas, its emissions directly affect a large population.

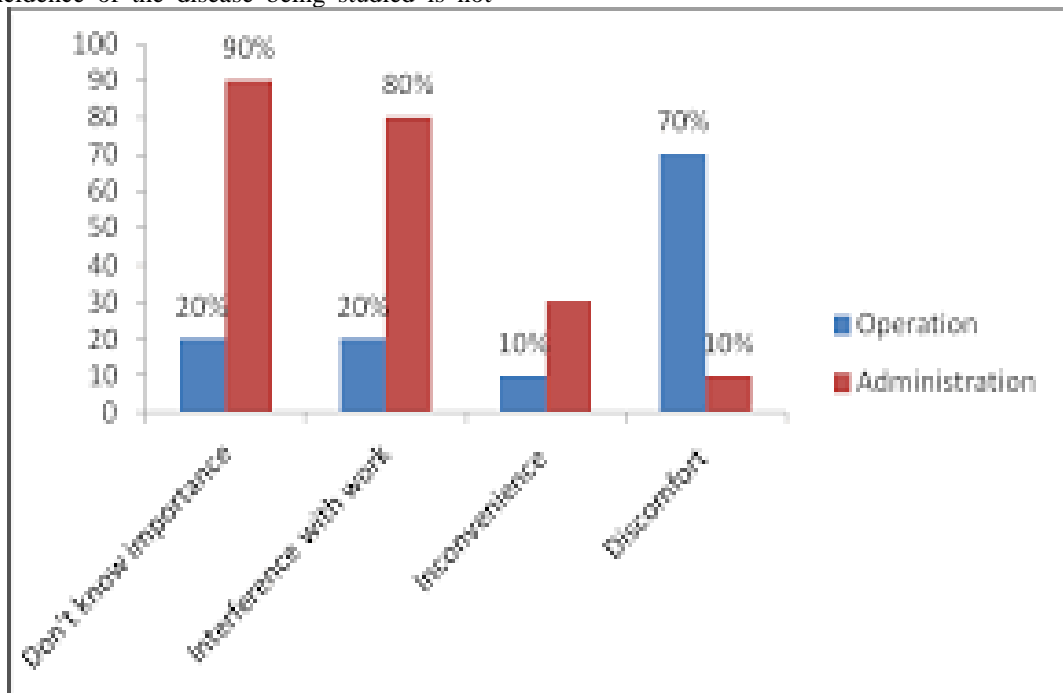
The consequences of exposure to environmental pollution can be very dangerous to human health, because they can cause various respiratory effects and other health problems leading to high death and morbidity. Studies on the environmental impact of brick kilns are scarce, but data on emissions from brick kilns are not available. This irregular industry in Pakistan poses a threat to public health from its emissions, especially to brick oven workers and those living nearby, with the risk of respiratory and other diseases. This study proposes to reduce the morbidity of brickworks workers due to breathing problems in brick kilns. The results will help define furnace emissions as a potential risk for people's breathing problems, and help formulate recommendations for policy makers to help this industry regulate public health emissions. and the environment.

**METHOD:**

This was a Comparative - cross sectional (analytical) study conducted on 407 kiln workers and 407 non kiln workers in patients of OPD Jinnah Hospital Lahore from March 2019 to March 2020 to determine the frequency of chronic obstructive pulmonary disease as occupational lung disease among brick kiln workers and compare the frequency of chronic obstructive pulmonary disease among brick kiln workers and the surrounding

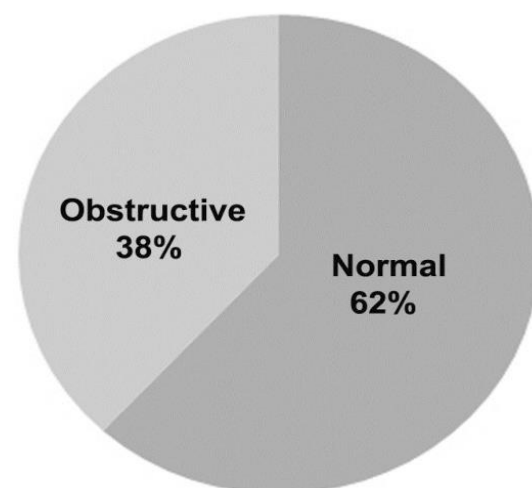
population. Brick kilns include brick kiln workers aged 25 to 65 who have at least 5 years' professional experience, as well as employees with a history of chronic diseases such as tuberculosis, asthma, and mental disability. Criteria for controlling smoking and smokers' work are excluded as follows: Checks on the production of ceramics or other types of furnaces (i.e. History of iron and ceramics production) were also excluded. The sampling technique is classified as simple random sampling. The sample size was calculated using Epi-Info 3.2.2 software. The use of statcalc software for comparative cross-sectional studies, assuming that the incidence of the disease being studied is not

known in the exposed population, i.e. in a brick oven worker, and can be taken as 50%. Using a 10% difference between the exposed population and the control group, the sample size for each group reaches 407, with a 95% confidence interval and 80% power, and 80% in total 814. The best values were used for the analysis. All spirometry measurements were made according to the American Thoracic Society criteria. Normal value: forced expiratory volume in one second, expressed as a percentage of forced vital capacity, is an excellent measure of airflow limitation. It is about 75% in normal people.



**RESULTS:**

The average age of participants is 35 years. The main symptoms in the study group were (57% v / s 6%) cough, (33% v / s 3%) sputum and (14% v / s 1%) shortness of breath. Spirometric results showed that the occurrence of chronic obstructive pulmonary disease (18.9% v / s 2.6%,  $p < 0.01$ ) in brick kiln workers compared to controls living within five kilometers). Chi Square; A significance test was applied to the results. In addition to brick kiln workers, there is a risk of developing chronic obstructive pulmonary disease compared to controls living outside the brick kiln industry. In blast furnace workers, cases of chronic obstructive pulmonary disease were higher than in the population living far away from blast furnaces. Brickyard workers and people living outside the kiln industry come from similar socioeconomic backgrounds. There were not many socio-economic and cultural differences because the control distance was about 5 kilometers within the radius of each furnace.



**DISCUSSION:**

The results of this study increased the significant decrease in mean FVC, FEV1 values and the relationship between FVC / FEV1 and this deterioration, with exposure time to brick kilns. This

group of workers working in a brick oven had work-related lung dysfunction. To determine the prevalence of COPD, brick kiln workers and people living outside the kiln industry were examined and diversified. COPD cases were higher in bakery employees compared to the population living far away from ovens (18.9% v / s 2.6%,  $p < 0.01$ ). The main aim of the study was to determine the incidence of chronic obstructive pulmonary disease among brickyard workers and to compare the incidence of chronic obstructive pulmonary disease among furnaces living in the furnace industry. The aim of the study was to provide evidence of the environmental impact of brick kilns on brick kiln workers and inspections of non-brick kilns, because such tests were terrible and less attention was paid in our country. Therefore, there may be poor regulations regarding the risk of environmental pollution from these furnaces. Chronic obstructive pulmonary disease among brickyard workers has led far less attention to humanitarian policies and programs in Pakistan, although it has led to disability-adjusted and leading-age lives. global mortality. In a study in Croatia, we examined 233 male workers and 149 matched control workers working in two brick factories. The average age of bricklayers is 35 years, and this sector employs an average of 16 years. Chronic respiratory symptoms and the incidence of acute symptoms have been reported in the work shift. Lung function was measured during the work shift, recording mandatory vital capacity curves (FVC), second forced expiratory volume (FEV1) and maximum expiratory volume curves (MEFV), which recorded flow rates of 50%. and the last 75% (FEF50, FEF75) FVC was measured. Chronic cough (31.8%), chronic sputum (26.2%) and chest tightness (24%) were significantly higher than controls (20.1%; 18.1%; 0%). ( $P < 0.05$ ). This increase in the incidence of symptoms shows that among non-smokers who are examined according to age and duration of employment, there is a work-related effect. Among the symptoms associated with changes in work, a high incidence of upper respiratory tract symptoms (e.g. dry throat, eye irritation, throat irritation) was observed. The measured values of FVC and FEV1 were much lower than predicted for brickmakers and suggested a restrictive model. The average FVC (in percentages predicted) was 78.1%, and FEV1 88.1%. FEF50 and FEF25 did not decrease significantly. These findings establish a restrictive model of lung function in the wall. In addition, there may be a bronchial component, as respiratory symptoms suggest. A similar study in China compared 526 exposed workers with 164 non-exposed control workers to pneumoconiosis and defects in respiratory function of silica brickyards. The lung function test showed that the incidence of pneumoconiosis increases over time and that the

exposed group experienced significantly more wheezing than the control group. It has also been shown that pneumoconiosis and respiratory disorders often occur in workers involved in brick-burning processes that cause high levels of silica dust exposure and exposure to silica dust in employees. damages pneumoconiosis and lung function in brickyards.

### CONCLUSION:

Brick kilns are known to be the main cause of environmental pollution. TSP and PM10 levels are important problems in the area around the bakery industry because these levels generally exceed WHO guidelines and can cause health problems, especially in the respiratory system. The main reason for air pollution and health hazards is the use of low-quality fuel. The consequences of exposure to air pollution from the environment are very dangerous to human health, because they can cause a number of breaths and other effects leading to high death and morbidity.

The results of this study can be useful as a basis for future work and for formulating policy recommendations on the safety of children living near the bakery industry. We must focus on appropriate strategies to achieve our goal of minimizing chronic obstructive pulmonary disease. We should establish strategies for preventing chronic obstructive pulmonary disease in the workplace; Chronic obstructive pulmonary disease can never be solved if the task of running the appropriate programs fails or is delayed.

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