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EFFECTIVENESS OF STRUCTURED TEACHING PROGRAMME ON KNOWLEDGE AND PRACTICE REGARDING RESPIRATORY HEALTH HAZARDS AMONG AGRICULTURE WORKERS IN SELECTED RURAL AREAS AT INDORE, MADHYA PRADESH

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ABSTRACT

Background: Agriculture workers are constantly exposed to respiratory hazards such as dust, pesticides, fertilizers, and other agrochemicals. Prolonged exposure to these agents increases the risk of respiratory disorders including asthma, chronic bronchitis, and chronic obstructive pulmonary disease (COPD). Awareness and adoption of protective practices can significantly reduce these risks.

Objective: To assess the effectiveness of a structured teaching programme (STP) on knowledge and practice regarding respiratory health hazards among agriculture workers in selected rural areas of Indore, Madhya Pradesh.

Methods: A pre-experimental one-group pretest–posttest design was adopted. A total of 150 agricultural workers were selected using simple random sampling. A structured knowledge and practice questionnaire was used to collect data before and after the intervention. The STP included information on respiratory hazards, prevention strategies, and the use of personal protective equipment (PPE). Data were analyzed using descriptive and inferential statistics.

Results: The mean pre-test knowledge score was **10.62 ± 3.24**, which increased to **18.47 ± 2.85** after the intervention. The mean difference of **7.85** was found statistically significant ($t = 19.42$, $p < 0.001$). Similarly, the mean pre-test practice score was **8.14 ± 2.52**, which improved to **15.36 ± 2.91** in the post-test with a mean difference of **7.22** ($t = 17.83$, $p < 0.001$). A positive correlation ($r = 0.69$, $p < 0.01$) was observed between knowledge and practice scores, indicating that improved knowledge led to better practice.

Conclusion: The structured teaching programme was highly effective in improving knowledge and practice regarding respiratory health hazards among agricultural workers. Health education interventions should be regularly implemented to promote awareness and preventive behavior in rural agricultural communities.

Keywords: Structured teaching programme, Respiratory health hazards, Agriculture workers, Knowledge, Practice, Indore, Madhya Pradesh

INTRODUCTION

Agriculture is the backbone of India's economy, providing livelihoods to nearly half of the population and contributing significantly to the nation's GDP. However, agricultural workers are often exposed to multiple occupational hazards, particularly respiratory health risks arising from dust, fertilizers, pesticides, organic matter, and smoke. These exposures occur during plowing, harvesting, pesticide spraying, and grain processing activities, where the inhalation of airborne particles and chemicals can lead to serious respiratory ailments.

Exposure to agricultural dust and pesticide residues has been associated with a higher prevalence of chronic respiratory conditions such as **asthma, chronic bronchitis, allergic rhinitis, and chronic obstructive pulmonary disease (COPD)**. Organic dusts, containing endotoxins and fungal spores, trigger inflammation of the respiratory tract, while exposure to chemical pesticides and fertilizers can cause airway irritation, reduced lung capacity, and long-term pulmonary complications (Gupta & Nair, 2019).

According to the **World Health Organization (WHO, 2022)**, approximately **30% of agricultural workers globally** are exposed to occupational respiratory hazards, and nearly **20% of these exposures result in respiratory-related morbidities**. In India, where the majority of farming activities still rely on traditional, manual methods, the situation is particularly concerning. Studies indicate that **40–50% of Indian agricultural workers** experience at least one respiratory symptom, such as coughing, wheezing, or breathlessness, due to prolonged exposure to dust and chemical pollutants (Kumar et al., 2021).

The problem is aggravated by **low awareness levels** regarding occupational safety measures and limited access to preventive equipment such as masks, gloves, and proper ventilation facilities. Moreover, the informal nature of agricultural employment often excludes workers from occupational health programs and routine medical checkups. Consequently, many respiratory problems remain undiagnosed and untreated until they progress to chronic conditions.

Health education plays a crucial role in bridging this knowledge gap. Structured teaching programmes (STPs) have been shown to significantly enhance understanding and improve preventive practices among agricultural workers. These educational interventions promote awareness of hazards, teach safe handling of chemicals, encourage the use of personal protective equipment (PPE), and reduce exposure risks (Reddy & Thomas, 2020). Community health nurses can effectively implement these programmes through group sessions, demonstrations, and counseling.

Recognizing the need for preventive strategies in rural agricultural communities, the present study was undertaken to **evaluate the effectiveness of a structured teaching programme on knowledge and practice regarding respiratory health hazards among agricultural workers in selected rural areas of Indore, Madhya Pradesh.** The findings of this study are expected to provide valuable insights into the importance of health education in preventing respiratory diseases among rural agricultural populations and to support the implementation of regular occupational health awareness programs at the community level.

BACKGROUND OF THE STUDY

Agriculture is one of the most significant occupations in India, employing a large portion of the rural population. According to the **Ministry of Agriculture and Farmers' Welfare (2023)**, nearly **45% of India's workforce** is engaged in agricultural and allied sectors. While agriculture sustains livelihoods, it also exposes workers to a range of occupational health hazards, particularly those affecting the respiratory system. Agricultural workers frequently encounter dust, pesticides, fertilizers, smoke from burning crop residues, and organic particles such as pollen and mold spores. Continuous exposure to these agents can result in both acute and chronic respiratory conditions, including **asthma, chronic bronchitis, allergic rhinitis, hypersensitivity pneumonitis, and chronic obstructive pulmonary disease (COPD)**.

Globally, respiratory health problems among agricultural workers have become a growing concern. The **World Health Organization (WHO, 2022)** reports that nearly **30% of agricultural workers** are exposed to occupational respiratory risks, leading to substantial disease burden and reduced productivity. In

developing nations like India, these hazards are often intensified due to traditional farming methods, limited mechanization, poor awareness, and lack of protective measures.

Several studies have highlighted the magnitude of respiratory health hazards among farmers in India. For example, **Kumar et al. (2021)** observed that about **42% of farmworkers in northern India** exhibited symptoms of respiratory distress, with a significant association between exposure duration and lung function decline. **Gupta and Nair (2019)** emphasized that pesticide applicators experienced higher prevalence of coughing, wheezing, and chest tightness due to inadequate respiratory protection. These findings underscore the urgent need for health education and preventive interventions in the agricultural community.

Despite the availability of protective equipment and safety guidelines, their use among agricultural workers remains minimal. The reasons include lack of awareness, poor risk perception, low literacy levels, and economic constraints. Many farmers fail to recognize the link between occupational exposure and respiratory illnesses until symptoms become severe. Moreover, most rural areas lack formal occupational health services, routine screening, and awareness campaigns.

Health education serves as a vital tool in empowering agricultural workers to protect themselves from occupational hazards. **Structured teaching programmes (STPs)**—designed to deliver systematic, evidence-based education—have proven effective in improving knowledge and promoting behavioral changes in various health domains. Such interventions can help workers understand the risks, adopt protective measures like masks and gloves, and follow safe practices while handling pesticides or working in dusty environments (Reddy & Thomas, 2020).

Given the high burden of respiratory diseases among agricultural workers and the limited awareness in rural areas, it becomes essential to implement targeted educational interventions. Therefore, the present study was designed to **evaluate the effectiveness of a structured teaching programme on knowledge and practice regarding respiratory health hazards among agricultural workers in selected rural areas of Indore, Madhya Pradesh.** This study aims to contribute to preventive occupational health strategies by enhancing awareness and promoting safe agricultural practices, ultimately improving the respiratory health and well-being of rural farming communities.

OBJECTIVES

1. To assess the pre-test and post-test knowledge scores regarding respiratory health hazards among agricultural workers.
2. To assess the pre-test and post-test practice scores regarding respiratory health hazards among agricultural workers.
3. To evaluate the effectiveness of the structured teaching programme on knowledge and practice.
4. To find the correlation between knowledge and practice scores.
5. To find the association between post-test knowledge and practice scores with selected demographic variables.

METHODOLOGY

Research Approach

The present study adopted a **quantitative evaluative research approach**, which aims to measure the effectiveness of a structured teaching programme (STP) in improving knowledge and practice regarding respiratory health hazards among agricultural workers. This approach was chosen because it enables the collection of numerical data and statistical evaluation of the impact of the intervention on participants' knowledge and practice levels.

Research Design

A **pre-experimental one-group pretest–posttest design** was used for the study. This design is suitable for evaluating the effectiveness of an intervention within the same group of participants, where data are collected before (pre-test) and after (post-test) the implementation of the structured teaching programme.

The design is represented diagrammatically as follows:

O_1 — X — O_2

Where:

- **O_1** = Pre-test observation (assessment of knowledge and practice)
- **X** = Intervention (Structured Teaching Programme)
- **O_2** = Post-test observation (re-assessment of knowledge and practice)

Setting of the Study

The study was conducted in **selected rural areas of Indore district, Madhya Pradesh.** These areas were chosen due to the high prevalence of agricultural activities and frequent exposure of workers to dust, fertilizers, and pesticides, which contribute to respiratory health risks. The rural setting provided an appropriate environment to assess the impact of the teaching programme in a real-life agricultural community.

Population

The **target population** consisted of agricultural workers who were actively engaged in farming activities for a minimum of **two years** and were residents of the selected rural areas of Indore district. These participants were chosen as they are more likely to be exposed to occupational respiratory hazards and could benefit directly from the educational intervention.

Sample Size

The total **sample size** of the study was **150 agricultural workers**. This number was determined considering feasibility, accessibility, and statistical adequacy to assess the effectiveness of the intervention.

Sampling Technique

A **simple random sampling technique** was used to select participants. A list of agricultural workers was obtained from local community records, and participants were randomly chosen to ensure unbiased representation of the rural farming population.

Criteria for Sample Selection

Inclusion Criteria:

- Agricultural workers aged between 20–60 years.
- Individuals engaged in farming activities for more than two years.
- Those willing to participate and available during the data collection period.

Exclusion Criteria:

- Workers with diagnosed chronic respiratory diseases under treatment.
- Individuals who had previously attended any health education session related to respiratory hazards.

Description of the Tool

A **structured questionnaire** was developed by the investigator based on literature review and expert opinion. It consisted of three sections:

- **Section I:** Demographic variables (age, gender, education, years of experience, smoking habit, type of farming, and use of protective devices).

- **Section II:** Knowledge questionnaire (25 multiple-choice questions) related to respiratory health hazards, causes, symptoms, preventive measures, and protective equipment.
- **Section III:** Practice checklist (15 items) assessing the use of safety measures, handling of pesticides, and hygiene practices.

The tool was validated by subject experts in community health nursing and public health, and reliability was tested using the **split-half method**, yielding a reliability coefficient (r = 0.82), indicating high internal consistency.

Intervention (Structured Teaching Programme)

The **structured teaching programme (STP)** was developed to educate agricultural workers on respiratory health hazards and preventive measures. The 45-minute session included information on:

- Common respiratory hazards in agriculture
- Symptoms and early signs of respiratory illness
- Importance and correct use of personal protective equipment (PPE)
- Safe pesticide handling and proper ventilation during spraying
- Basic first aid and health-seeking behavior

Teaching aids included **charts, posters, leaflets, demonstrations, and PowerPoint slides.** The teaching session was followed by an interactive discussion to clarify doubts and reinforce learning.

Data Collection Procedure

1. **Pre-test:** Participants' baseline knowledge and practice were assessed using the structured questionnaire.
2. **Intervention:** The structured teaching programme was administered to the group in an interactive format.
3. **Post-test:** After seven days, the same tool was administered to evaluate changes in knowledge and practice.

The entire data collection period lasted for two weeks.

Data Analysis

The collected data were analyzed using **descriptive and inferential statistics**:

- **Descriptive statistics:** Mean, standard deviation, frequency, and percentage were used to describe demographic data and scores.
- **Inferential statistics:**
  - **Paired t-test** was used to compare pre-test and post-test scores of knowledge and practice.
  - **Pearson's correlation coefficient (r)** was used to find the relationship between knowledge and practice.
  - **Chi-square test** was used to determine the association between post-test scores and selected demographic variables.

All tests were performed at a **0.05 level of significance ($p < 0.05$).**

Tool: Structured questionnaire consisting of:

- **Section I:** Demographic variables (age, gender, education, occupation, years of farming, exposure duration, use of PPE, etc.)
- **Section II:** Knowledge questionnaire (25 multiple-choice questions)
- **Section III:** Practice checklist (15 items)

Intervention: A 45-minute structured teaching programme on respiratory health hazards, preventive measures, and use of personal protective equipment (mask, gloves, and proper ventilation). Teaching aids included charts, posters, leaflets, and demonstrations.

Data Collection Procedure:

1. Pre-test data were collected using the structured questionnaire.
2. STP was administered to the group.
3. Post-test was conducted after seven days using the same tool.

Data Analysis:

Descriptive statistics (mean, SD, frequency, percentage) and inferential statistics (paired t-test and Pearson's correlation) were applied.

RESULTS

Table 1: Comparison of Knowledge Scores (n = 150)

Test	Mean ± SD	Mean Difference	t-value	p-value
Pre-test	10.62 ± 3.24	7.85	19.42	<0.001
Post-test	18.47 ± 2.85			

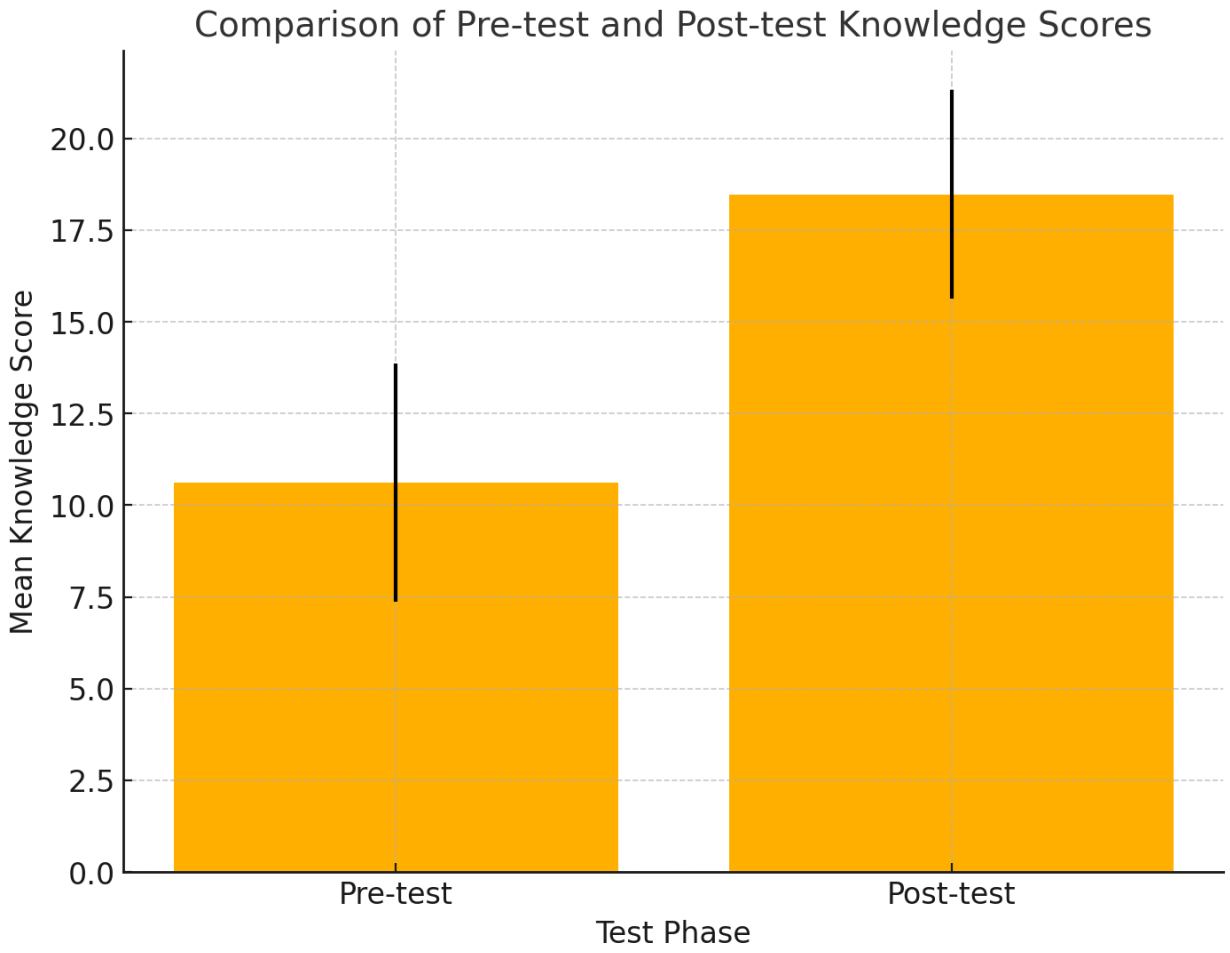

Table 2: Comparison of Practice Scores (n = 150)

Test	Mean ± SD	Mean Difference	t-value	p-value
Pre-test	8.14 ± 2.52	7.22	17.83	<0.001
Post-test	15.36 ± 2.91			

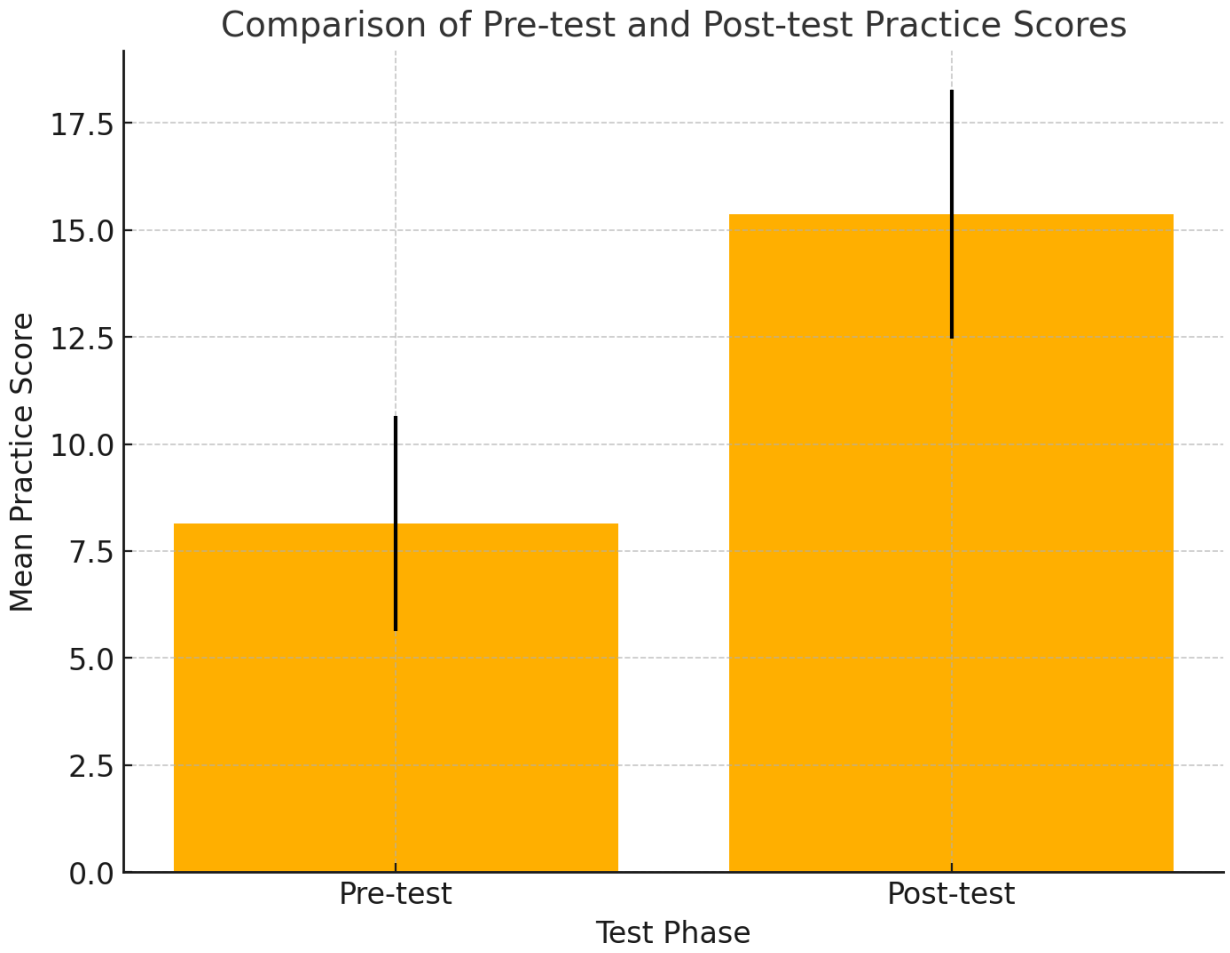

Table 3: Correlation Between Knowledge and Practice Scores

Variable	r-value	p-value
Knowledge vs. Practice	0.69	<0.01

Interpretation: The structured teaching programme was effective in improving both knowledge and practice levels among agricultural workers. A strong positive correlation between knowledge and practice indicated that increased awareness directly influenced safer work behavior.

DISCUSSION

The findings of this study demonstrated a significant improvement in the knowledge and practice of agricultural workers after the structured teaching programme. Similar findings were reported by **Reddy et al. (2020)** who observed a significant increase in awareness regarding pesticide exposure among farmers after health education. **Patel & Joshi (2021)** also found that structured educational interventions effectively improved the use of respiratory protective equipment in rural Gujarat.

The post-test improvement suggests that continuous education and community-based awareness campaigns can substantially reduce the prevalence of respiratory illnesses in agricultural populations.

CONCLUSION

The study concluded that the structured teaching programme was highly effective in enhancing the knowledge and practice regarding respiratory health hazards among agricultural workers in Indore district. Regular training and community health education should be integrated into rural health services to promote preventive behavior and reduce occupational respiratory diseases.

RECOMMENDATIONS

1. Periodic health education sessions should be organized for agricultural workers.
2. The use of personal protective equipment must be promoted and subsidized.
3. Longitudinal studies should be conducted to assess the sustained impact of such interventions.
4. Community health nurses should actively participate in rural occupational health promotion.

LIMITATIONS

- The study was limited to a small sample size (150 participants) in selected rural areas.
- Only short-term effectiveness was assessed; long-term retention was not evaluated.

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