

“A Study to Assess the Attitude Towards the Sugarcane Workers on Preventive Measures Against the Bagassosis (Occupational Disorder) At Selective Community Area, Pondicherry”.

MRS. S. SAKTHYPRIYA¹, DR.G.MUTHAMILSELVI² & NITHYA.V³.

¹Assistant Professor, Department of Community Health Nursing, SMVNC, Puducherry.

²Principal, OBG Department, SMVNC, Puducherry-605 107.

³B.Sc. Nursing IV-Year, Sri Manakula Vinayagar Nursing College, Puducherry-605 107.

Corresponding Author: Mrs. S. Sakthypriya.

ABSTRACT

Bagassosis is a rare but significant occupational respiratory disorder caused by inhalation of bagasse dust contaminated with thermophilic actinomycetes, particularly *Thermo actinomyces sacchari*. Bagasse is the fibrous residue left after the extraction of juice from sugarcane and is widely used in sugar industries as fuel and raw material for paper and board manufacturing. Prolonged exposure to moldy bagasse dust can lead to hypersensitivity pneumonitis, an inflammatory condition affecting the alveoli and interstitial tissues of the lungs. Common symptoms of bagassosis include cough, fever, chills, chest tightness, breathlessness, and progressive respiratory impairment. Attitude towards preventive measures plays a vital role in reducing occupational exposure and preventing bagassosis among sugarcane workers. Workers who possess a favourable attitude are more likely to use protective masks, maintain workplace hygiene, reduce direct exposure to bagasse dust, and undergo regular health check-ups. Conversely, an unfavourable attitude may lead to negligence in adopting safety precautions, thereby increasing the risk of developing occupational respiratory disorders.

Key Words: Bagassosis, Sugarcane Workers, Occupational Health, Preventive Measures, Attitude, Respiratory Occupational Disease & Community Health.

I. INTRODUCTION

Bagassosis is a chronic occupational respiratory disease caused by inhalation of dust from bagasse, the fibrous residue that remains after extraction of juice from sugarcane.

Bagasse contains fine organic particles and thermophilic microorganisms, particularly *Thermo actinomyces sacchari*, which can provoke hypersensitivity reactions in the lungs when inhaled repeatedly over a prolonged period. The disease primarily affects sugarcane workers and employees in sugar mills who are regularly exposed to bagasse dust during harvesting, transportation, processing, and storage of sugarcane. Sugarcane cultivation and sugar production are major agricultural and industrial activities in India, providing employment to thousands of workers. These workers often perform physically demanding tasks in dusty environments without adequate protective measures.

II. NEED FOR THE STUDY

In worldwide, Bagassosis is a well-recognized occupational respiratory disease among workers exposed to bagasse dust in sugarcane-processing industries. It is a type of hypersensitivity pneumonitis caused by inhalation of mold-contaminated bagasse, particularly containing *Thermoactinomyces sacchari*. Although exact global prevalence data are limited because the disease is often underdiagnosed, studies conducted in sugar-producing countries have reported that 5% to 30% of exposed workers develop respiratory symptoms suggestive of bagassosis or other occupational lung disorders. The World Health Organization estimates that nearly 2.4 million deaths occur annually due to occupational diseases, and respiratory disorders account for a substantial proportion of this burden. In countries such as Brazil, Thailand, Pakistan, and India, where sugarcane cultivation and sugar production are major industries, workers are routinely exposed to organic dust and fungal spores. Epidemiological investigations have shown that 20%–40% of sugar factory workers report chronic cough, wheezing, and breathlessness, emphasizing the occupational health significance of bagasse dust exposure. These findings highlight the importance of positive worker attitudes toward preventive measures such as mask use, proper ventilation, and periodic medical examinations.

STATEMENT OF THE PROBLEM:

“A study to assess the attitude towards the sugarcane workers on preventive measures against the bagassosis (occupational disorder) at selective community area, Pondicherry,”

OBJECTIVES :

1. To assess the attitude of sugarcane workers towards preventive measures against bagassosis.
2. To associate the attitude of sugarcane workers towards preventive measures against bagassosis with their selected demographic variables.

III. RESEARCH METHODOLOGY:

RESEARCH APPROACH:

A quantitative research approach was adopted for the present study.

RESEARCH DESIGN:

A descriptive research design was adopted for the present study.

SETTING OF THE STUDY:

The present study was conducted at Sanyasikuppam area near Thirubhuvanai, Puducherry.

POPULATION:

The study population consisted of all the sugarcane field harvesting workers in Sanyasikuppam community area.

SAMPLE:

The study sample consists of sugarcane workers who fulfilled the inclusion criteria.

SAMPLE SIZE:

The sample size consists of 50 sugarcane workers residing in the selected community area of Puducherry.

SAMPLE TECHNIQUE:

A convenience sampling technique was used for the present study.

DESCRIPTION OF THE TOOL

SECTION A: DEMOGRAPHIC VARIABLES

The demographic variables of the sugarcane workers in this study included age, gender, religion, educational status, occupation, marital status, monthly family income, years of work experience in sugarcane-related activities, previous history of respiratory problems, awareness about bagassosis, and source of information regarding bagassosis.

SECTION B: QUESTIONNAIRES

A modified and validated 5-point Likert attitude scale was used to assess the attitude of sugarcane workers towards occupational respiratory diseases and preventive measures against bagassosis. The tool was developed by the investigator based on an extensive review of literature and previously published occupational health and safety questionnaires.

SCORING INTERPRETATION:

S.NO	Level of Attitude	Percentage Range	Score Range
1	Unfavourable Attitude	0% – 50%	0 – 6
2	Moderately Favourable Attitude	51% – 75%	7 – 9
3	Favourable Attitude	Above 75%	10 – 13

Section A:	Description of the demographic variables of the sugarcane workers.
Section B:	Assessment the level of attitude towards the sugarcane workers on preventive measures against the bagassosis.
Section C:	Association of the level of attitude towards the sugarcane workers on preventive measures against the bagassosis among sugarcane workers with their selected demographic variables.

Section A: Description of the demographic variables of the sugarcane workers.

Table 1.1: Frequency and percentage wise distribution of the demographic variables of the sugarcane workers.

S. No	Demographic Variable	Categories	Frequency (n)	Percentage (%)
1	Age (in years)	20–30 years	12	24.0

		31–40 years	15	30.0
		41–50 years	14	28.0
		Above 50 years	9	18.0
2	Gender	Male	32	64.0
		Female	18	36.0
3	Religion	Hindu	42	84.0
		Christian	5	10.0
		Muslim	3	6.0

Among the 50 sugarcane workers included in the study, 15 (30%) were in the age group of 31–40 years, 14 (28%) were in the age group of 41–50 years, 12 (24%) were aged 20–30 years, and 9 (18%) were above 50 years of age. With regard to gender, the majority of the participants, 32 (64%), were male, while 18 (36%) were female. In terms of religion, 42 (84%) of the sugarcane workers were Hindus, 5 (10%) were Christians, and 3 (6%) were Muslims.

Figure 1: Percentage wise distribution of the sugarcane workers according to the educational status

Regarding educational status, 17 (34%) had primary education, 14 (28%) had secondary education, 11 (22%) had no formal education, and 8 (16%) had higher secondary education and above.

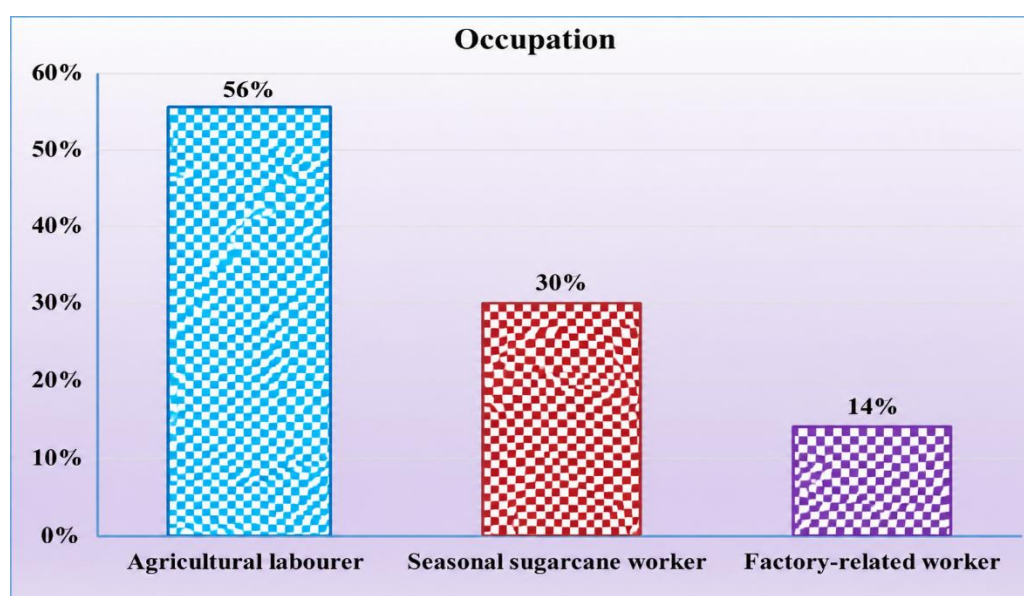
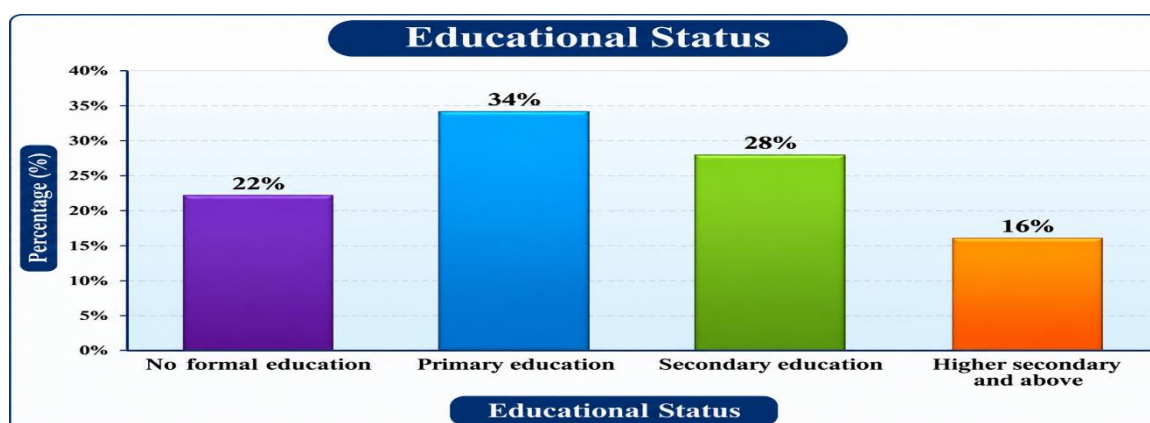


Figure 2: Percentage wise distribution of the sugarcane workers according to the occupation

With respect to occupation, 28 (56%) were agricultural labourers, 15 (30%) were seasonal sugarcane workers, and 7 (14%) were involved in factory-related work.

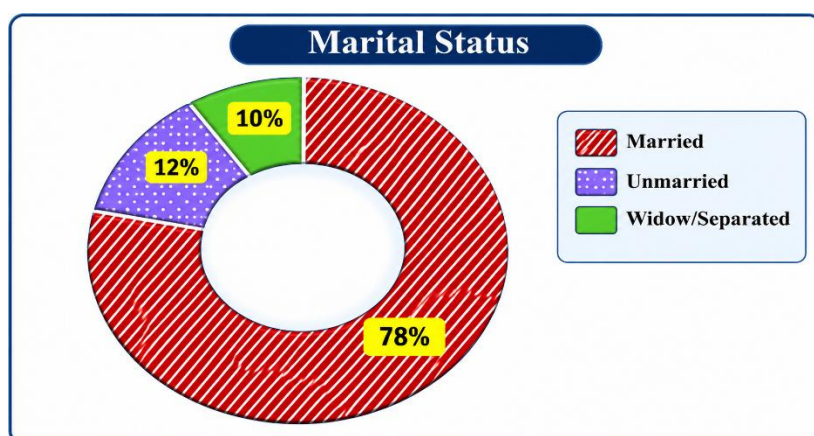


Figure 3: Percentage wise distribution of the sugarcane workers according to the marital status

Regarding marital status, the majority of the participants, 39 (78%), were married, 6 (12%) were unmarried, and 5 (10%) were widowed or separated.

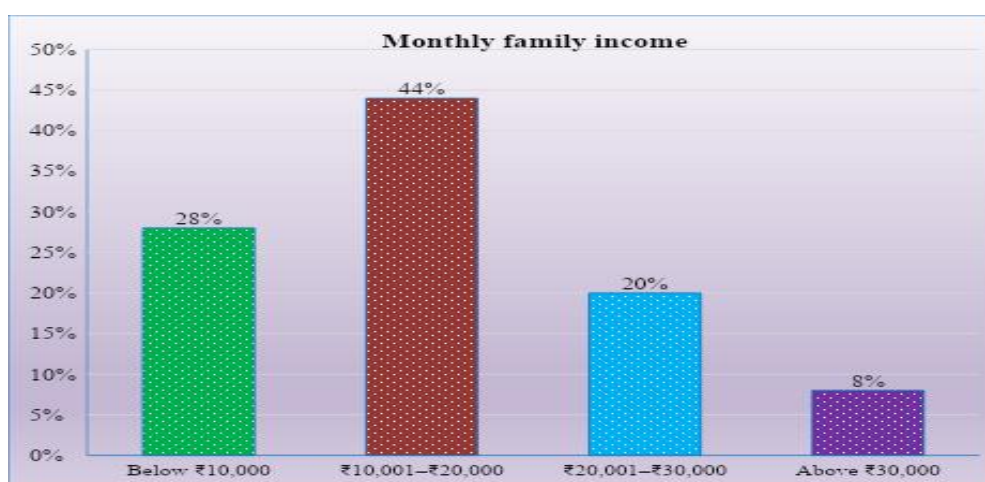


Figure 4: Percentage wise distribution of the sugarcane workers according to the monthly family income

In relation to monthly family income, 22 (44%) had an income of ₹10,001–₹20,000, 14 (28%) had an income below ₹10,000, 10 (20%) had an income of ₹20,001–₹30,000, and 4 (8%) had an income above ₹30,000.

Table 1.2: Frequency and percentage wise distribution of the demographic variables of the sugarcane workers.

S. No	Demographic Variable	Categories	Frequency (n)	Percentage (%)
1	Years of Work Experience in Sugarcane Work	Less than 5 years	10	20.0
		5–10 years	16	32.0
		11–15 years	13	26.0
		More than 15 years	11	22.0
2	Previous History of Respiratory Problems	Yes	18	36.0
		No	32	64.0
3	Awareness About Bagassosis	Yes	12	24.0
		No	38	76.0
4	Source of Information Regarding	Health personnel	8	16.0

	Bagassosis	Mass media	6	12.0
		Friends/Relatives	10	20.0
		No prior information	26	52.0

Concerning years of work experience in sugarcane-related activities, 16 (32%) had 5–10 years of experience, 13 (26%) had 11–15 years of experience, 11 (22%) had more than 15 years of experience, and 10 (20%) had less than 5 years of experience.

Regarding previous history of respiratory problems, 32 (64%) reported no history of respiratory illness, whereas 18 (36%) reported a previous history of respiratory problems.

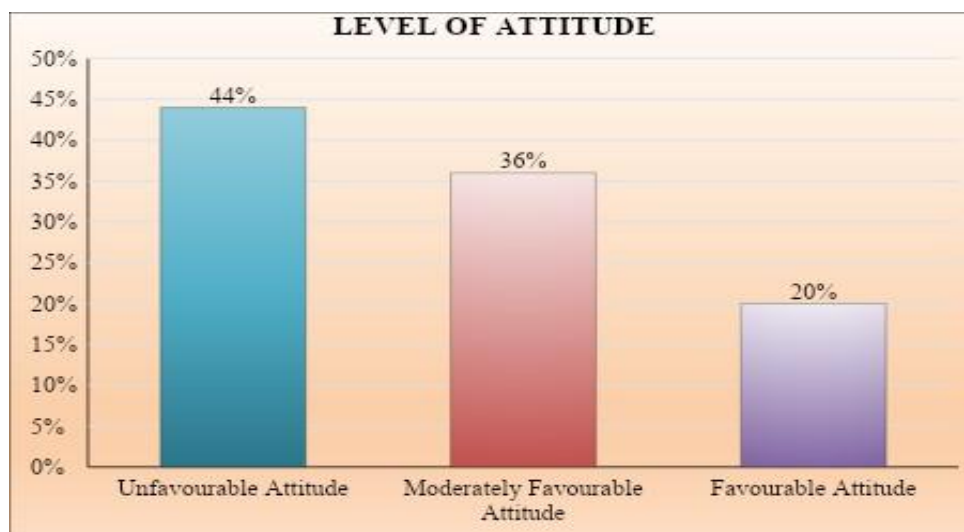


Figure 5: Percentage wise distribution of the level of attitude towards the sugarcane workers on preventive measures against the bagassosis.

Table 2: Frequency and percentage wise distribution of the level of attitude towards the sugarcane workers on preventive measures against the bagassosis.

S. No	Level of Attitude	Frequency (n)	Percentage (%)
1	Unfavorable Attitude	22	44
2	Moderately Favorable Attitude	18	36
3	Favorable Attitude	10	20
Total		50	100

Table 2 reveals that among the 50 sugarcane workers included in the study, the majority, 22 (44%), had an unfavourable attitude towards preventive measures against bagassosis (occupational disorder). This was followed by 18 (36%) workers who had a moderately favourable attitude, while only 10 (20%) workers demonstrated a favourable attitude.

Section C: Association of the level of attitude towards the sugarcane workers on preventive measures against the bagassosis among sugarcane workers with their selected demographic variables.

Table: 3 Association of the level of attitude towards the sugarcane workers on preventive measures against the bagassosis among sugarcane workers with their selected demographic variables.

S. No	Demographic Variable	Category	Unfavorable Attitude (F/%)	Moderately Favorable Attitude (F/%)	Favorable Attitude (F/%)	χ^2 , df, p-value
1	Age (in years)	20–30 years	4 (33.3%)	5 (41.7%)	3 (25.0%)	$\chi^2 = 2.184$, df = 6, p = 0.902 (NS)
		31–40 years	6 (40.0%)	6 (40.0%)	3 (20.0%)	
		41–50 years	7 (50.0%)	4 (28.6%)	3 (21.4%)	
		Above 50 years	5 (55.6%)	3 (33.3%)	1 (11.1%)	
2	Gender	Male	14 (43.8%)	12 (37.5%)	6 (18.7%)	$\chi^2 = 0.128$, df = 2, p = 0.938 (NS)
		Female	8 (44.4%)	6 (33.3%)	4 (22.3%)	
3	Religion	Hindu	18 (42.9%)	15 (35.7%)	9 (21.4%)	$\chi^2 = 0.842$, df = 4, p = 0.933 (NS)
		Christian	2 (40.0%)	2 (40.0%)	1 (20.0%)	
		Muslim	2 (66.7%)	1 (33.3%)	0 (0.0%)	
4	Educational Status	No formal education	7 (63.6%)	3 (27.3%)	1 (9.1%)	$\chi^2 = 9.864$, df = 6, p = 0.130 (NS)
		Primary education	8 (47.1%)	6 (35.3%)	3 (17.6%)	
		Secondary education	5 (35.7%)	6 (42.9%)	3 (21.4%)	
		Higher secondary and above	2 (25.0%)	3 (37.5%)	3 (37.5%)	
5	Occupation	Agricultural labourer	14 (50.0%)	10 (35.7%)	4 (14.3%)	$\chi^2 = 4.276$, df = 4, p = 0.370 (NS)
		Seasonal sugarcane worker	5 (33.3%)	5 (33.3%)	5 (33.3%)	
		Factory-related worker	3 (42.9%)	3 (42.9%)	1 (14.2%)	
6	Marital Status	Married	18 (46.2%)	14 (35.9%)	7 (17.9%)	$\chi^2 = 1.968$, df = 4, p = 0.742 (NS)
		Unmarried	2 (33.3%)	2 (33.3%)	2 (33.3%)	
		Widowed/ Separated	2 (40.0%)	2 (40.0%)	1 (20.0%)	
7	Monthly Family Income	Below ₹10,000	8 (57.1%)	4 (28.6%)	2 (14.3%)	$\chi^2 = 7.426$, df = 6, p = 0.283 (NS)
		₹10,001–₹20,000	9 (40.9%)	8 (36.4%)	5 (22.7%)	
		₹20,001–₹30,000	3 (30.0%)	5 (50.0%)	2 (20.0%)	
		Above ₹30,000	2 (50.0%)	1 (25.0%)	1 (25.0%)	
8	Years of Work Experience	Less than 5 years	3 (30.0%)	4 (40.0%)	3 (30.0%)	$\chi^2 = 11.284$, df = 6, p = 0.080 (NS)
		5–10 years	6 (37.5%)	7 (43.8%)	3 (18.7%)	
		11–15 years	7 (53.8%)	4 (30.8%)	2 (15.4%)	
		More than 15 years	6 (54.5%)	3 (27.3%)	2 (18.2%)	
9	Previous History of Respiratory Problems	Yes	10 (55.6%)	6 (33.3%)	2 (11.1%)	$\chi^2 = 2.918$, df = 2, p = 0.232 (NS)
		No	12 (37.5%)	12 (37.5%)	8 (25.0%)	
10	Awareness About Bagassosis	Yes	2 (16.7%)	4 (33.3%)	6 (50.0%)	$\chi^2 = 12.556$, df = 2, p = 0.002 (S)
		No	20 (52.6%)	14 (36.8%)	4 (10.6%)	

11	Source of Information	Health personnel	1 (12.5%)	3 (37.5%)	4 (50.0%)	$\chi^2 = 14.832$, df = 6, p = 0.022 (S)
		Mass media	1 (16.7%)	3 (50.0%)	2 (33.3%)	
		Friends/Relatives	4 (40.0%)	4 (40.0%)	2 (20.0%)	
		No prior information	16 (61.5%)	8 (30.8%)	2 (7.7%)	

S- Significant at $p < 0.05$; NS- Non-Significant

The table shows the association between the level of attitude towards preventive measures against bagassosis and selected demographic variables among sugarcane workers. Awareness about bagassosis and source of information regarding bagassosis showed a statistically significant association with the level of attitude ($p < 0.05$). There was no statistically significant association between the level of attitude and age, gender, religion, educational status, occupation, marital status, monthly family income, years of work experience in sugarcane-related activities, and previous history of respiratory problems ($p > 0.05$). Overall, awareness about bagassosis and source of information regarding bagassosis had a significant influence on the level of attitude.

IV. SUMMARY

The present study was conducted among sugarcane workers in a selected community area of Pondicherry to assess their attitude towards preventive measures against bagassosis (occupational disorder). Formal permission was obtained from the concerned authorities before data collection. The purpose and objectives of the study were explained to all participants, and informed consent was obtained. A total of 50 sugarcane workers who fulfilled the inclusion criteria were selected using a convenience sampling technique. A self-structured attitude scale developed by the investigator was used to assess the attitude of sugarcane workers towards preventive measures against bagassosis. The collected data were recorded systematically, and confidentiality of responses was maintained throughout the study.

V. CONCLUSION

The study concluded that the majority of the sugarcane workers had an unfavourable attitude towards preventive measures against bagassosis (occupational disorder), indicating a substantial gap in their perception and acceptance of occupational safety practices. Only a small proportion of the participants demonstrated a favourable attitude towards preventive measures such as wearing protective masks, minimizing exposure to bagasse dust, maintaining personal hygiene, and undergoing regular health check-ups. The findings also showed a statistically significant association between the level of attitude and selected demographic variables, with awareness about bagassosis and source of information regarding bagassosis emerging as the only factors significantly influencing the attitude of sugarcane workers.

NURSING IMPLICATIONS

The findings of this study have important implications for nursing practice, education, administration, and research in promoting positive attitudes towards preventive measures against bagassosis and protecting the respiratory health of sugarcane workers.

NURSING EDUCATION

- Nurse educators should incorporate comprehensive content related to occupational health hazards, including bagassosis, into undergraduate and postgraduate nursing curricula.
- Educational programmes should emphasize the role of nurses in creating awareness among sugarcane workers regarding the causes, symptoms, complications, and preventive measures of bagassosis.
- Community health nursing training should include strategies for planning and implementing effective occupational health education programmes for agricultural and industrial workers.
- Continuing nursing education programmes should update nurses regarding occupational respiratory disorders, personal protective equipment, and preventive strategies for dust-related lung diseases.

NURSING PRACTICE

- Community health nurses should conduct regular awareness programmes in villages and work communities regarding bagassosis and its preventive measures.
- Nurses should assess the attitudes and practices of sugarcane workers during home visits, health camps, and occupational health outreach programmes.
- Health education materials such as pamphlets, posters, flashcards, and audiovisual aids should be used to reinforce awareness regarding bagassosis prevention.

- Nurses should encourage sugarcane workers to use protective masks, maintain personal hygiene, and undergo periodic medical examinations.
- Nurses should provide counseling regarding early recognition of respiratory symptoms such as chronic cough, wheezing, chest tightness, and breathlessness, and facilitate timely referral for medical evaluation.

NURSING ADMINISTRATION

- Nursing administrators should organize in-service education programmes and workshops on occupational health and prevention of bagassosis.
- Policies should be developed to integrate occupational health education into routine community and workplace health services.
- Collaboration with primary health centres, agricultural departments, sugar industries, local organizations, and community leaders should be encouraged to implement structured occupational health awareness campaigns.
- Periodic monitoring and evaluation of educational programmes should be conducted to assess their effectiveness and identify areas for improvement.

NURSING RESEARCH

- Further studies can be conducted to assess the effectiveness of structured teaching programmes in improving attitudes towards preventive measures against bagassosis.
- Research can explore barriers that prevent sugarcane workers from adopting occupational safety measures.
- Studies may evaluate the long-term impact of occupational health education programmes on preventive practices and respiratory health outcomes.
- Comparative studies between different geographical settings and worker populations can provide broader insights into attitudes toward occupational health hazards.

VI. RECOMMENDATIONS

- A similar study may be conducted with a larger sample size to enhance the generalizability of the findings.
- Interventional studies can be undertaken to evaluate the effectiveness of structured educational programmes in improving attitudes towards preventive measures against bagassosis.
- Future research may examine the relationship between educational status and adoption of occupational safety practices.
- Studies can explore the effectiveness of mass media, digital tools, and community-based campaigns in strengthening awareness regarding bagassosis.
- Comparative studies can be conducted in different geographical settings to assess variations in attitudes toward preventive measures against bagassosis.
- Longitudinal studies may be carried out to evaluate the sustainability of attitude changes following occupational health education interventions.

Journal References

- [1]. Abbas M, Rehman M, Emaan I, Shaukat U, Farooq SUR, Rehman M. Comparative effect of Buerger-Allen exercise and intraneural facilitation on lower extremity perfusion and peripheral neuropathy symptoms among patients with Type II Diabetes Mellitus. *Journal of Health and Rehabilitation Research*. 2024;4(2):1511-1517.
- [2]. Saleh MA, Ahmed SS, Bakr ZH. Effect of Buerger Allen exercise on lower limb perfusion and peripheral neuropathy among patients with peripheral vascular diseases. *Egyptian Journal of Health Care*. 2024;15(1):1248-1261. doi:10.21608/ejhc.2024.344814.
- [3]. Suresh S, Kumar R, Prakash M, Devi P. Respiratory symptoms among sugar industry workers exposed to occupational hazards. *Journal of Advanced Medical and Pharmaceutical Sciences*. 2024;6(6):286-291.
- [4]. G. Muthamilselvi, A Study to evaluate the effectiveness of comprehensive oral care on knowledge and practice regarding oral health among school children at , *Indian journal of natural sciences* 13 (72), 43463-43469.
- [5]. Ergonomic Evaluation of Occupational Health Hazards of Farmers Involved in Sugarcane Cultivation. *Peer Reviewed Occupational Health Study*. 2025.
- [6]. Sakthipriya. S et al (2024). A study to assess the effectiveness of structured teaching programme on knowledge regarding bagassosis among the sugar cane workers in selected community area, Puducherry. *Journal of Emerging Technologies and Innovative Research*, 11(6), A287–A293. *JETIR Journal*
- [7]. Ramadoss, S., Kumar, R., & Prakash, V. (2022). Pulmonary function changes among sugar industry workers exposed to bagasse dust in South India. *Indian Journal of Occupational and Environmental Medicine*, 26(3), 145–150.
- [8]. Dr. G. Muthamilselvi, Soyabeen-“Yellow Jewel” *TNNMC Journal of Obstetrics and Gynaecological Nursing* 4 (2), 31-34.
- [9]. Kulkarni, R. S., Patil, M. R., & Joshi, S. P. (2020). Occupational respiratory morbidity among sugar factory workers exposed to bagasse dust in Karnataka. *International Journal of Community Medicine and Public Health*, 7(8), 3012–3017.
- [10]. Nandi, S. S., Ghosh, A., & Dutta, P. (2018). Respiratory morbidity among industrial workers exposed to organic dust. *Journal of Occupational Health*, 60(4), 312–318.

- [11]. G. Sathyavathy, Evaluate the effectiveness of STP on knowledge and attitudes about safety measures regarding handling of chemotherapy drugs with cancer clients among the nurses in GOVT general hospital at Anantapur, *International Journal of renewable energy exchange- JJTU*, ISSN:2321-1067/Volume 10, Issue 12, Impact Factor : 7.52, PP 110-117.
- [12]. G. Sathyavathy, **Marburg Virus Disease (MVD)**, *International Journal of Nursing and Health Science (IOSR-JNHS)* e-ISSN: 2320–1959.p- ISSN: 2320–1940 Volume 12, Issue 3 Ser.3 (May. – June. 2023), impact factor: 4.59, Ser.3 (May. – June. 2023), PP 24-31.
- [13]. Yerpude, P. N., Jogdand, K. S., & Zodpey, S. P. (2013). Respiratory morbidity among sugar factory workers in Maharashtra. *International Journal of Health Sciences and Research*, 3(9), 34–39.
- [14]. Sakthypriya.S (2024).A study to assess the level of knowledge on bagassosis among sugarcane workers at selected community area, puducherry, *Journal of emerging technology and innovative research*, issue 6,june 2024 ISSN.2349-5162.
- [15]. Sakthypriya.S(2024).A study to assess the effectiveness of STP on bagassosis among the sugarcane workers selected community area,puducherry, *Journal of emerging technology and innovative research*, issue 6 june ISSN: 2349-5162.
- [16]. Sharma, M. K., Singh, R., & Verma, P. (2010). Respiratory health status among sugar mill workers in Uttar Pradesh. *Indian Journal of Preventive and Social Medicine*, 41(3–4), 215–220.