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Implementation of Health and Safety Standards in Sugar Industries of Bidar District

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ABSTRACT

Workplace health and safety measures play a vital role in protecting employees from occupational hazards and promoting their overall well-being. The present study examines employees' perceptions of workplace health and safety measures in the sugar industry. The study is based on primary data collected from 100 employees through a structured questionnaire. Descriptive statistics, correlation analysis and regression analysis were used to analyze the data. The findings reveal that employees generally hold favorable opinions regarding the availability of clean drinking water, sanitation facilities, waste disposal arrangements, ventilation standards, fire-fighting equipment, first aid facilities, and machinery safeguards. The correlation analysis indicates a strong positive relationship between workplace health and safety measures, while the regression analysis confirms that these measures significantly influence employees' perceptions of workplace safety. The study concludes that effective implementation of health and safety measures contributes significantly to employee well-being, workplace safety, and organizational productivity. Appropriate recommendations are suggested to further strengthen occupational health and safety practices in the sugar industry.

Keywords: *Workplace Health, Occupational Safety, Employee Well-being, Implementation, Safety Measures.*

Introduction

The sugar industry is the second largest industry in India after the textile industry and plays an important role in the growth of the Indian economy. India is considered the original home of sugarcane cultivation. In recent years, sugar production and consumption have increased significantly, creating direct and indirect employment opportunities for a large number of people through this sector. One of the unique features of the sugar industry is the close relationship between sugar factories and sugarcane cultivators, as both are mutually dependent on each other.

The sugar industry is a labour-intensive industry that provides employment to a large section of the population in both organized and unorganized sectors. Like other industries, it employs workers with different skills at various levels of management. Therefore, it becomes essential for the management to make effective and efficient use of employees' skills and abilities.

Human resource practices are mainly concerned with the people working in organizations, whether in private, public or co-operative sectors. These practices focus on developing employees according to their aspirations as well as organizational requirements. Human resources serve as an

important means for the proper utilization and development of other resources. Hence, human resource practices greatly influence the overall performance of an organization, and in the sugar industry, human resources play a crucial role.

The sugar industry also contributes significantly to the development of rural areas. It is broadly classified into two sectors, namely private and cooperative sugar factories. Both sectors require skilled and trained human resources for their successful operations. Therefore, a detailed study of selected cooperative sugar factories would be highly beneficial for improving and strengthening human resource practices in sugar factories.

HRM Practices Related to Health and Safety Measures

At the outset, it may be stated that existing theories support the view that the satisfaction level of employees is closely associated with performance at both the organizational and business-unit levels. Employee satisfaction has either a positive or negative influence on productivity, profitability, efficiency, employee turnover, loyalty, work commitment and morale. This relationship has been widely accepted not only in theory but has also been confirmed through several research studies conducted across the world. In the Indian context, the Ministry of Labour and Employment has introduced a National Policy Statement on Safety, Health and Environment at the workplace. Though a detailed discussion of this policy is not necessary here, it is important to note that even at the administrative level in India, proper recognition has been given to this principle.

It is important to mention that the provisions related to the health of workers under the Factories Act are covered in Sections 11 to 20, which regulate and protect the health conditions of employees working in factories. Similarly, the provisions relating to the safety of workers are included in Sections 21 to 41 of the Factories Act. These provisions are mandatory and binding in nature, and every factory management is legally required to comply with them.

All these provisions concerning the health and safety of workers are intended to regulate, supervise and ensure proper working conditions in factories covered under the Factories Act. The implementation of these provisions is subject to inspection and monitoring by the Government authorities. In addition, trade unions functioning within these factories closely observe the level of implementation and frequently raise issues with the management whenever statutory provisions are not properly followed. Further, organizations covered under the Factories Act are required to provide accurate and relevant information to interested parties seeking verification regarding compliance with the standards and requirements, wherever such verification is demanded by contract.

Review of Literature

Review of literature forms the foundation of any research study. It enables the researcher to gain a clear and detailed understanding of the research problem. It also helps in identifying previous studies, concepts and research gaps related to the topic. Thus, review of literature provides proper direction and support for conducting effective research.

De Clercq (2025)[1] in the study "List of Preventive Measures to Be Applied in the Sugar Industry" emphasized the need for effective preventive measures to reduce occupational hazards in sugar factories and refineries. The study identified major risks such as dust exposure, fire and explosion hazards, mechanical injuries, chemical handling and thermal risks. It suggested measures like compliance with safety regulations, use of PPE, regular cleaning, staff training and installation of dust control systems and ventilation facilities. The study also stressed safe equipment maintenance, ergonomic practices, proper lighting, non-slip flooring and safe chemical storage to improve workplace safety. It concluded that these preventive measures help in reducing workplace hazards, protecting workers and ensuring efficient and sustainable operations in the sugar industry.

Vipra, Avarachan, Jose, Kudi and Lata (2024)[2] conducted a descriptive study titled "A Descriptive Study to Assess the Knowledge, Attitude and Practice of Employees Regarding Prevention of Occupational Health Hazards in a Selected Sugar Mill of Uttar Pradesh." The study evaluated employees' awareness and preventive practices related to occupational health hazards among 100 workers in a cooperative sugar mill in Uttar Pradesh. Findings revealed that although most workers had a positive attitude towards occupational safety, their knowledge and safety practices were inadequate. Many workers suffered from occupational health problems such as respiratory issues, fractures, eye infections and burn injuries. The study concluded that lack of awareness and poor preventive practices increase

occupational risks and emphasized the need for regular training and awareness programs to improve workers' safety and health practices.

Abdelrahim and Kheiralla (2023)[3] in their study titled "Sugarcane Agro-Industrial Health and Safety with Particular Focus on Sudan: A Systematic Literature Review" examined occupational health and safety issues in sugarcane production and processing, especially in developing countries like Sudan. The review analyzed 21 studies and identified major hazards related to manual cutting, harvesting and sugar processing activities. The authors found that workers are exposed to respiratory, cardiovascular, renal and skin-related health problems. The study highlighted that occupational safety management in the sugar industry remains inadequate despite the sector's economic importance. It concluded that effective safety strategies, proper regulations and further research are essential to reduce occupational hazards and ensure sustainable productivity.

Kumbhar and Bhosale (2023)[4] in their study "Study on Environmental Impact Assessment of the Sugar Industry" examined the environmental impacts caused by sugar industry operations and the importance of Environmental Impact Assessment (EIA). The study pointed out that sugar production creates pollution and waste that negatively affect air, water, soil, human health and ecosystems. The authors emphasized the need for proper waste management practices such as recycling, reuse and safe disposal of industrial waste. Utilization of by-products like bagasse and press-mud was suggested as a sustainable waste management approach. The study concluded that proper implementation of EIA helps in environmental protection, resource management and sustainable industrial development.

Mohamed, Abd-El-Aal and Ibrahim (2022)[5] conducted a study titled "Health Promoting Lifestyle among Sugar Factory Worker Regarding Occupational Health Hazards" to assess workers' lifestyle and awareness about occupational hazards in a sugar factory. The study involved 280 workers and used interviews, observation checklists and lifestyle assessment tools for data collection. Findings showed that many workers suffered from occupational health problems and had only moderate knowledge about workplace hazards. A considerable number of workers also followed poor health-promoting lifestyle practices, while parts of the factory environment were found unsafe. The study recommended regular health education and awareness programs to improve workers' safety, health knowledge and lifestyle practices.

Significance of the Study

The present study examines the effectiveness of health and safety measures implemented in cooperative sugar factories of Bidar district. Human resources are considered the most valuable asset in sugar factories, as they influence the efficient functioning of all other resources. Since the sugar industry is labour-intensive, effective human resource practices are essential for organizational success. Proper utilization, development and maintenance of employees have become highly important in ensuring efficient management and smooth industrial operations.

Objective of the Study

The objective of the study is to examine the effectiveness of health and safety measures in sugar factories of Bidar district. The study also aims to analyze employees' awareness and suggest measures for improving workers' safety and well-being.

- Implementation of Health and Safety Standards in selected sugar factories.
- To scrutinize in detail effectiveness of HR practices related to Health and Safety measures at selected sugar factories.
- To make the suggestions for effective implementation of Health and Safety HR measures in sample factories.

Hypothesis of the Study

Based on the stated objectives, the following hypotheses can be formulated:

H_0: Workplace health and safety measures do not have a significant influence on employees' perceptions of workplace safety.

H_1: Workplace health and safety measures have a significant influence on employees' perceptions of workplace safety.

Research Methodology

The present study adopted a descriptive research design to examine workplace health and safety measures in the sugar industry of Bidar district. The purposive sampling method was used to select four sugar factories representing the co-operative, private, and public sectors. The selected factories were Naranja Sahakari Sakkare Karkhane Limited (NSSK), Imampur; Mahatma Gandhi Sahakari Sakkare Karkhane Limited (MGSSK), Hunji (A), Bhalki; Bidar Kissan Shakhar Karkhana Limited (BKSK), Mogdal, Markunda; and Bhalkeshwar Sugar Limited (BSL), Bajolga, Bhalki. Primary data were collected from 100 employees through a structured questionnaire, while secondary data were gathered from books, journals, reports, and official records. The collected data were analyzed using statistical tools such as percentage analysis, mean, standard deviation, correlation, and regression analysis with the help of SPSS software.

Limitations of the Study

- The study is concerned with only health and safety facilities of our sugar factories in Bidar district.
- To maintain secrecy data as well as information is not fully provided.

Regulatory Framework of Health and Safety Measures in Sugar Factories

Health and safety measures in sugar factories are implemented to protect workers from occupational hazards and ensure a safe working environment. Governed by the Factories Act, 1948 and other labour welfare regulations, these measures include maintaining cleanliness, proper waste disposal, adequate ventilation, sufficient lighting, safe drinking water, medical facilities and regular health check-ups. Safety provisions involve guarding machinery, providing personal protective equipment, maintaining fire protection systems and conducting safety training programmes. Factory management is responsible for ensuring compliance with these requirements, while safety officers and labour inspectors monitor their implementation. These measures help safeguard workers' health, reduce industrial accidents, improve working conditions and enhance productivity in the sugar industry.

Employee Health and Safety Measures

Employee health and safety measures refer to the policies, facilities and practices implemented to protect workers from occupational hazards and ensure their physical well-being at the workplace. These measures include providing safe drinking water, sanitation facilities, adequate ventilation, proper lighting and medical assistance. Employees are also provided with personal protective equipment such as helmets, gloves, masks, boots and goggles to minimize workplace risks. Regular health check-ups, safety training programmes, fire protection systems and machine safeguards help prevent accidents and occupational diseases. Effective health and safety measures contribute to a secure working environment, improve employee welfare, enhance productivity and reduce workplace injuries.

- **Clean and Pure Drinking Water**

The provision of a sufficient supply of clean and pure drinking water is an essential health and welfare measure in every factory. Access to safe drinking water helps protect workers from water-borne diseases and promotes their overall health and well-being. Factories are required to provide drinking water at convenient and easily accessible locations, ensuring that it is hygienically maintained and regularly tested for quality. The availability of clean drinking water contributes to employee comfort, improves productivity and supports a healthy working environment.

- **Hygienic Washing and Sanitation Facilities**

The provision of adequate and hygienic washing and sanitation facilities is essential for maintaining workers' health, hygiene, and comfort in a factory environment. Proper washing facilities enable employees to maintain personal cleanliness and reduce the risk of infections and occupational illnesses. Clean and well-maintained sanitation facilities help ensure a healthy workplace by preventing the spread of diseases and promoting hygienic practices among workers. The availability of such facilities reflects the organization's commitment to employee welfare, workplace health, and compliance with statutory requirements.

- **Waste and Effluents Disposal Arrangements**

Proper arrangements for the disposal and treatment of waste and effluents are essential for maintaining a safe, healthy, and environmentally responsible workplace. Effective waste management systems help prevent pollution, minimize health hazards, and ensure compliance with environmental regulations. The treatment of industrial effluents before discharge reduces the risk of contaminating water, soil, and surrounding ecosystems. Adequate waste disposal and treatment practices demonstrate the factory's commitment to environmental protection, employee well-being, and sustainable industrial operations.

- **Ventilation and Temperature Standards**

Ventilation and temperature conditions that meet statutory standards are essential for ensuring a safe, healthy, and comfortable working environment. Proper ventilation helps remove dust, fumes, heat, and airborne contaminants, thereby improving air quality and reducing occupational health risks. Suitable temperature control minimizes worker discomfort, fatigue, and heat-related stress, contributing to better efficiency and productivity. Compliance with statutory requirements for ventilation and temperature reflects the factory's commitment to employee welfare and workplace safety.

- **PPE provided and used by workers**

The provision and proper use of Personal Protective Equipment (PPE) are essential for safeguarding workers from occupational hazards in the workplace. PPE such as helmets, gloves, safety shoes, goggles, masks, and protective clothing helps reduce the risk of injuries, exposure to harmful substances, and workplace accidents. Employers are responsible for providing suitable PPE, while workers are expected to use it correctly during their duties. The effective use of PPE demonstrates a strong commitment to employee safety, health protection, and compliance with occupational safety regulations.

- **Fire-fighting Equipment and First aid facilities**

The adequate provision and accessibility of fire-fighting equipment and first aid facilities are essential for ensuring workplace safety and emergency preparedness. Fire extinguishers, fire alarms, hydrants, and other fire safety equipment help control fire hazards and minimize potential damage and injuries. Similarly, well-equipped first aid facilities enable prompt medical assistance in the event of accidents or health emergencies, reducing the severity of injuries. The availability and easy accessibility of these facilities demonstrate the factory's commitment to protecting workers and maintaining a safe working environment.

- **Machinery Safeguards**

The installation of proper safeguards on machinery and self-acting machines is essential for preventing workplace accidents and ensuring worker safety. Safety guards, protective barriers, emergency stop devices, and other protective mechanisms help prevent accidental contact with moving parts and reduce the risk of injuries. These safeguards are particularly important in industries where workers operate or work near hazardous equipment. The presence of adequate machine guarding reflects the factory's commitment to maintaining a safe working environment and complying with occupational safety regulations.

Data Analysis and Interpretation

Data analysis and interpretation are essential components of research that help convert collected data into meaningful information. Data analysis involves organizing, classifying, and examining data using appropriate statistical tools. Interpretation refers to explaining the results and understanding their significance in relation to the study objectives. It helps in identifying trends, patterns, and relationships within the data. The findings are then used to draw conclusions and provide suitable recommendations.

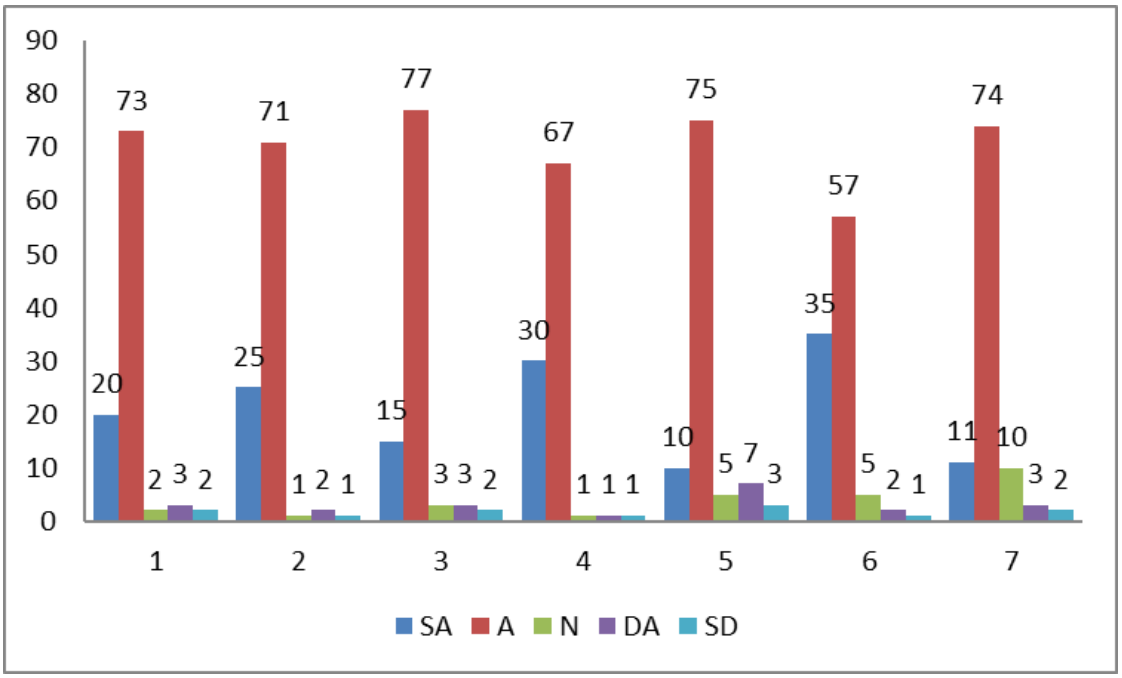
- **Employee Perception of Workplace Health and Safety Measures**

The below table presents the Health and Safety Measures 100 responses collected from 04 Sugar Factories. The responses are categorized into five levels: Strongly Agree, Agree, Neutral, Disagree and Strongly Disagree. This classification helps in understanding the Employee Perception of Workplace in sample area.

Table 1: Employee Perception of Workplace Health and Safety Measures

Sl. No.	Variables/Statements	SA	A	N	DA	SD	Total
1	Clean and Pure Drinking Water	20	73	02	03	02	100
2	Hygienic Washing and Sanitation Facilities	25	71	01	02	01	100
3	Waste and Effluents Disposal Arrangements	15	77	03	03	02	100
4	Ventilation and Temperature Standards	30	67	01	01	01	100
5	PPE provided and used by workers	10	75	05	07	03	100
6	Fire-fighting Equipment and First aid facilities	35	57	05	02	01	100
7	Machinery Safeguards	11	74	10	03	02	100

Source: Primary data



Graph 1: Employee Perception of Workplace Health and Safety Measures

Interpretation

The table reveals that a majority of employees expressed positive perceptions regarding workplace health and safety measures in the sugar factories. Most respondents agreed or strongly agreed that clean drinking water, hygienic sanitation facilities, waste disposal arrangements, ventilation and temperature standards, fire-fighting equipment and first aid facilities were adequately provided. Ventilation and temperature standards, along with fire-fighting and first aid facilities, received the highest levels of strong agreement, indicating a favorable safety environment. Although the majority of employees also expressed positive opinions regarding the provision of personal protective equipment (PPE) and machinery safeguards, these measures recorded comparatively lower levels of strong agreement and higher neutral or disagreement responses. The sugar factories have implemented satisfactory health and safety measures, contributing to employee well-being and workplace safety.

- **Mean and Standard Deviation**

Mean and standard deviation analysis was employed to assess employees' perceptions of workplace health and safety measures in the sugar factories. The mean score indicates the average level of agreement among respondents, while the standard deviation measures the extent of variation in their responses. This analysis helps identify the health and safety measures that are perceived most favorably by employees.

Table 2: Mean and standard Deviation of Workplace Health Safety Measures

Sl. No.	Variables	Mean	SD
1	Clean and Pure Drinking Water	4.06	0.72
2	Hygienic Washing and Sanitation Facilities	4.17	0.63
3	Waste and Effluents Disposal Arrangements	4.00	0.69
4	Ventilation and Temperature Standards	4.24	0.62
5	PPE provided and used by workers	3.82	0.82
6	Fire-fighting Equipment and First aid facilities	4.23	0.72
7	Machinery Safeguards	3.89	0.71

(Source: Compiled from SPSS)

- **Correlation Analysis**

Correlation analysis is used to examine the relationship between various workplace health and safety measures perceived by employees. It helps determine whether improvements in one safety aspect are associated with improvements in other safety provisions. A positive correlation indicates that employees who express favorable opinions about one health and safety measure are also likely to have favorable perceptions of other safety measures. This analysis provides a comprehensive understanding of the effectiveness and integration of health and safety practices within the sugar factory.

Table 3: Correlation between Workplace Health and Safety Measures

Variables	Correlations(r)
Workplace Health and Safety Measures	0.84

(Source: Compiled from SPSS)

The correlation coefficient of 0.84 indicates a strong positive relationship among the workplace health and safety measures. This suggests that improvements in one safety provision are closely associated with improvements in other health and safety practices within the sugar factory. The high correlation value reflects the effectiveness of the integrated health and safety management system adopted by the factory. It also indicates that employees who perceive one aspect of workplace safety positively are likely to have favorable perceptions of other safety measures. Therefore, the findings confirm that the various health and safety provisions collectively contribute to creating a safe, healthy and productive working environment for employees.

- **Regression Analysis**

Regression analysis was carried out to determine the influence of workplace health and safety measures on employees' overall perception of workplace safety. The results obtained from SPSS indicate the extent to which workplace health and safety measures contribute to the dependent variable.

Table 3: Regression analysis of workplace Health and Safety Measures

Variables	Beta	Significance
Workplace Health and Safety Measures	0.840	0.000*

(Source: Compiled from SPSS)

The regression analysis indicates that workplace health and safety measures have a strong positive influence on the dependent variable, as reflected by the beta coefficient of 0.840. This suggests that improvements in health and safety practices significantly enhance employees' workplace experiences and perceptions. The significance value of 0.000 confirms that the relationship is statistically significant at the 1 percent level. Therefore, the null hypothesis is rejected and the alternative hypothesis is accepted. The findings highlight that effective implementation of health and safety measures plays a vital role in ensuring employee well-being and maintaining a safe working environment in the sugar factory.

- **Hypothesis Result**

Since the significance value **(**p = 0.000**)** is less than 0.01, the null hypothesis (H_0) is rejected and the alternative hypothesis (H_1) is accepted. This indicates that workplace health and safety measures have a statistically significant positive influence on employees' perceptions of workplace safety. Therefore, effective health and safety practices contribute significantly to creating a safe and healthy working environment in the sugar factory.

Findings of the Study

The study found that employees generally have positive perceptions of workplace health and safety measures in the sugar factory, particularly regarding sanitation, ventilation, drinking water, and emergency facilities. The analysis revealed a strong positive relationship between health and safety measures and employee perceptions, indicating their significant contribution to workplace well-being and safety.

- The majority of employees expressed positive opinions regarding the availability of clean and pure drinking water, indicating satisfactory drinking water facilities in the factory.
- Employees reported high levels of satisfaction with hygienic washing and sanitation facilities, reflecting the factory's commitment to workplace hygiene.
- Waste and effluent disposal arrangements were perceived positively by most respondents, suggesting effective environmental and sanitation management practices.
- Ventilation and temperature standards received the highest level of employee approval, indicating a comfortable and healthy working environment.
- Most employees agreed that fire-fighting equipment and first aid facilities were adequately available and accessible within the factory premises.
- Personal Protective Equipment (PPE) and machinery safeguards received comparatively lower ratings, indicating the need for further improvement in these areas.
- The correlation analysis revealed a strong positive relationship ($r = 0.84$) among workplace health and safety measures.
- Regression analysis showed a significant positive influence of workplace health and safety measures on employee perceptions **(**$\beta = 0.840$, $p = 0.000$**).**

Suggestions of the Study

The study suggests that the sugar factory should further strengthen workplace health and safety measures by enhancing the provision and use of personal protective equipment, conducting regular safety training programs and ensuring periodic maintenance of machinery and safety facilities. Continuous monitoring and improvement of safety practices will help promote employee well-being and create a safer working environment.

- The factory should strengthen the provision and regular use of Personal Protective Equipment (PPE) through continuous monitoring and employee awareness programs.
- Periodic inspection and maintenance of machinery safeguards should be undertaken to minimize workplace accidents and operational risks.
- Regular health and safety training programs should be organized to improve employee awareness regarding safe work practices.
- The management should conduct frequent safety audits and risk assessments to identify and address potential workplace hazards.
- Fire-fighting equipment and first aid facilities should be regularly tested and updated to ensure their effectiveness during emergencies.
- Employee participation in safety committees and safety-related decision-making should be encouraged to enhance workplace safety culture.
- Continuous monitoring of sanitation, waste disposal, ventilation and drinking water facilities should be maintained to sustain high health and safety standards.

Conclusion

The study concludes that workplace health and safety measures play a crucial role in ensuring employee well-being and maintaining a safe working environment in the sugar factory. The findings indicate that employees are generally satisfied with the health and safety provisions available in the workplace, particularly regarding sanitation facilities, ventilation standards, drinking water supply and emergency safety measures. The correlation and regression analyses confirm a strong and significant relationship between health and safety measures and employee perceptions. Therefore, continuous

improvement and effective implementation of workplace health and safety practices are essential for enhancing employee satisfaction, reducing occupational risks and improving overall organizational productivity.

References

1. De Clercq (2025). List of preventive measures to be applied in the sugar industry. Food and Animal Feed. Available at: https://www.linkedin.com/pulse/risk-prevention-sugar-industry-guillaume-de-clercq.
2. Vipra, Avarachan, Jose, Kudi and Lata (2024). A descriptive study to assess the knowledge, attitude and practice of employees regarding prevention of occupational health hazards in a selected sugar mill of Uttar Pradesh. International Journal of Community Medicine and Public Health. https://doi.org/10.18203/2394-6040.ijcmph20243288.
3. Abdelrahim and Kheiralla (2023). Sugarcane Agro-Industrial Health and Safety with Particular Focus on Sudan: A Systematic Literature Review. Journal of Public Health Hygiene and Safety, 5(1), 103. https://www.annexpublishers.com/articles/10.1186/safety-sugarcane-sudan.
4. Kumbhar and Bhosale (2023). Study on environmental impact assessment of the sugar industry. Shivaji University, Kolhapur. International Journal of Engineering Research & Technology Published by: www.ijert.org Vol. 8 Issue 12, December-2019.
5. Mohamed, Abd-El-Aal and Ibrahim (2022). Health promoting lifestyle among sugar factory worker regarding occupational health hazards. Journal of Nursing Science-Benha University, ISSN 2682-3934 Vol. (3) No (2), 1 July 2022.

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