

MORBIDITY PROFILE OF WORKERS AND WORKPLACE ASSESSMENT IN SELECTED ICE CREAM INDUSTRY IN BENGALURU

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Abstract

Background: The high risk, fast-paced industrial expansion reflects unique health and safety challenges for occupational health and safety resulting in increasing incidence of various injuries and health morbidities. This warrants the assessment of morbidity profile and workplace assessment of the workers. **Methods:** A facility based cross sectional descriptive study was carried out among 55 workers of selected ice cream factory in Bengaluru. Workers were interviewed using a semi-structured questionnaire for their morbidity profile and work ability. Finally, workplace assessment was also done. **Results:** Of 55 workers interviewed, 60% belonged to the age category of 20-30 years and nearly 40% were working in the cold area where production of ice cream was happening. Among 55 participants, 40% of them belonged to 18.5- 22.9 Kg/m², which in normal, 41.8% had Hypertension, 3.6% of them had RBS more than 140 mg/dL, 47 (85.5%) of them had anaemia. Majority of them were not using gloves (80%), boots (83.6%), mask (45.5%) and eye shield (91%) while working in the factory. But most of them wore their head cap (60%) and apron (56.4%). **Conclusions:** The morbidity of workers in selected ice cream industries were very less as majority of the workers was from the organized sectors with regular periodic examination. Hence further studies concentrating only on the unorganized small-scale industries are recommended. It is considered a top priority to improve the hygienic status of the produced ice-cream in addition to implementing regulatory measures for ensuring the safety and quality of ice cream.

Introduction

World Health Organization had defined occupational health as 'Promotion and maintenance of the highest degree of physical, mental and social well-being of workers in all occupations; the prevention among workers of departures from health caused by their working conditions; the protection of workers in their employment from risks resulting from factors adverse to health; the placing and maintenance of workers in an occupational environment adopted to his physiological and psychological capabilities.'^[1] The International Labour Organization (ILO) states "The inadequate prevention of occupational diseases has profound negative effects not only on workers and their families but also on society at large due to the

tremendous costs that it generates; particularly, in terms of loss of productivity and burdening of social security systems.^[2]

Dairy production can also contribute to local-, regional-, and national-level economies and provide opportunities for employment and income generation which are critical determinants of health.^[3] However, a number of potential health harms associated with dairy production and consumption have also been identified, including diet-related chronic diseases, environmental change, foodborne hazards, occupational hazards, and zoonotic diseases. It is important to mention that the ice cream industry consumes raw materials from the dairy industry, which accounts for 5% of India's GDP. Demand for milk, butter and cream will also be reduced as the efficiency of this industry is affected. This can impact the livelihood of farmers, and those associated with the dairy industry, and ancillary food processing industries.^[4]

Several aspects are significant in the production of high quality ice-cream and are related to the stages of production, which incorporate cleaning and sanitation, hygiene of storage area, hygienic design and personnel training. The failure to apply these practices may prompt high bacterial count and potential public health problems. As most of the ice-cream consumers are children of the vulnerable age groups, it is required to be microbiologically safe^[5]

In order to understand more about the setting where employees work and the physical factors of the worksite that alters employee's health, an environment assessment is an opportunity. Physical work environment assessment can identify a number of opportunities for employers to improve the employees' health status. Low temperatures are necessary in the production of industrial frozen food, which keep the maintains the quality of fresh food for longer. However, it can be dangerous causing the body core temperature to drop^[6]

There are several studies that examine the effects of a low temperature working environment and its impact on health in other locations, therefore we should pay attention to these impacts because there are a large number of warehouse workers whose jobs are located in low temperature work environments^[7]

On account of the great importance of ice cream consumption and its role as a carrier of some public health risks, the present study was conducted to assess the morbidity profile of workers in ice cream factory.

Methodology

A cross-sectional study conducted in a selected ice cream factory in Bengaluru. After obtaining the necessary permissions from the factory and Institute Ethical Committee Clearance, a total of 55 subjects who were present on the day of examination were included in the study. The study was conducted from October to December 2020. Universal sampling technique was employed in the study. Consent from the workers were taken prior to data collection.

Health screening was performed on the subjects to determine their height, weight, pallor, blood pressure and random blood sugar (RBS) levels. The subject's weight was recorded in kilograms using an analogue weighing scale, and height was labelled in centimetre using a measuring tape, which was posted on the wall. Subjects were gathered to stand barefoot, heels, back, and occiput touching the wall, with the Frankfurt plane parallel to the ground. A scale was put at the top of the head, and a reading was obtained while avoiding parallax. Body Mass Index (BMI) was calculated manually using the formula weight (in Kg) divided by height (in metre square).

Pallor was noticed at the following areas: lower palpebral conjunctiva, tongue, inner mucus membranes of the mouth, and finger nails. Blood pressure was assessed using automatic

blood pressure monitor. Subjects with the history of Hypertension was labelled as hypertensive, and subjects with systolic blood pressure above 140 mm of Hg and diastolic blood pressure above 90 mm of Hg, were monitored and referred to nearby health care centre. Random blood sugar (GRBS) was done after consent by finger prick using calibrated standardized equipment. The readings for height, weight, pallor, blood pressure and RBS were taken by certified doctors who were trained before the study, and they were overseen. The study was started after the approval by the Institutional Ethical Committee. The data collected was entered in Microsoft Excel and was analysed using SPSS version 16. Descriptive statistics like frequency and proportions were applied.

Results

Mean age of the participants is 26.64 ± 7.06 years. Among 55 participants, majority of them belonged to 20- 30 years category (60%), had finished at least secondary school (47.2%), were not ESI beneficiary (60%), worked in cold room (38.2%), with a monthly income of Rs 5000- Rs 9999 (78.2%), working at least 8 hours a day (58.5%) and had 1- 5years experience in the field (60%) (**Table 1**).

Table 1: Socio-demographic profile of the participants (n=55)

Variable	Frequency	Percentage
Age category		
15-19	10	18.2
20-30	33	60
31-40	10	18.2
41-50	2	3.6
Educational category		
Never went to school	5	9.1
Primary school	4	7.3
Secondary school	26	47.2
Higher secondary school	10	18.2
Graduate	10	18.2
ESI beneficiary		
Yes	21	38.2
No	33	60
Don't know	1	1.8
Designation		
HR	1	1.8
Production	8	14.6
Cold room	21	38.2
Cleaner	7	12.7
Maintenance	7	12.7
Purchase	6	10.9
Driver	5	9.1
Monthly income		
Rs.5000-Rs9999	43	78.2
Rs.10000-Rs15000	5	9.1
Rs.16000-Rs25000	7	12.7

Working hours		
8 hours	47	85.5
9 hours	1	1.8
10 hours	7	12.7
Years of experience		
Less than 12 months	12	40
1-5 years	33	60
more than 5 years	0	0

Among 55 participants, 40% of them belonged to 18.5- 22.9 Kg/m², which in normal, 41.8% had Hypertension, 3.6% of them had RBS more than 140 mg/dL, 47 (85.5%) of them had anaemia (**Table 2**). Among 47 of the anaemics, most of them were males (56.4%). At the time of examination, 14.6% had backache/ myalgia, 9.1% had Diarrhoea and 5.4% had upper respiratory tract infection (**Table 2**).

Table 2: Health status of the participants (n=55)

Variables	Frequency	Percentage
BMI category		
Less than 18.5	7	12.7
18.5-22.9	22	40
23.0-24.9	9	16.4
25.0-29.9	15	27.3
more than 30	2	3.6
Hypertension		
Yes	23	41.8
No	32	58.2
RBS		
Less than 140	53	96.4
More than 140	2	3.6
Anaemic (n=47)		
Male	31	56.4
Female	16	43.6
Symptoms present		
No symptoms	29	52.7
Backache/myalgia	8	14.6
Upper respiratory tract infection	3	5.4
Diarrhea	5	9.1
Others	10	18.2

All of the participants followed the handwashing practices (100%), majority of them had their nails trimmed (89.1%) but none of them had received Cholera vaccination and only one person was vaccinated against Typhoid vaccination (**Table 3**). Majority of them were not using gloves (80%), boots (83.6%), mask (45.5%) and eye shield (91%) while working in the factory. But most of them wore their head cap (60%) and apron (56.4%) (**Table 3**).

Table 3: Practices followed by the participants in the factory (n=55)

Variable	Frequency	Percentage
Handwashing practices		
Adequate	55	100
Not adequate	0	0
Nails trimmed		
Yes	49	89.1
No	6	10.9
Cholera vaccination		
Yes	0	0
No	55	100
Typhoid vaccination		
Yes	1	1.8
No	54	98.2
Stool examination		
Yes	0	0
No	55	100
Gloves/muffins using		
Yes	11	20
No	44	80
Head cap		
Yes	33	60
No	22	40
Boots		
Yes	9	16.4
No	46	83.6
Mask		
Yes	30	44.5
No	25	45.5
Eye shield		
Yes	5	9
No	50	91
Apron		
Yes	31	56.4
No	24	43.6

Majority of them didn't know the importance of using PPE at the working area (56%) and also 18% thought it was not necessary, 10% were working mainly for the cleaning, 8% did not have the PPE, and 8% of them were ignorant (**Table 4**).

Table 4: Reasons for not using PPE (n=50)

Reasons for not using PPEs	Frequency	Percentage
Don't know	28	56
Boots not available	4	8
Cleaning work so not necessary for my work	5	10
Ignorance	4	8

Not necessary	9	18
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Discussion

This is one of the fewer studies conducted in this part of the country to get an insight into the morbidity profile of the workers along with the assessment of workplace of the ice cream industries. Inadequate working conditions linked to the induction of the stress response, and poor lifestyle factors such as long working hours, may increase the risk for obesity. During stress glucocorticoids are released which inhibit the positive effects of the growth and thyroid hormones on lipolysis and muscle anabolism musculoskeletal disorders were present in 18.3% of the workers. This finding is consistent with other study conducted by Engholm *et al.*^[8] Hence, there is a need of health education regarding use of personal protective devices. Availability of accurate figures through routine reporting and registering systems need to be developed on the lines of the Sample registration system of NSSO. The ESI corporation, which aims to deliver comprehensive occupational health services to all workers, should also be integrated with the general health services.

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