Research Paper
Life Style Factors and Morbidity Pattern of Biscuit Company Workers in Puducherry City, India

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ABSTRACT

Background: The baking industry does not have a hazardous occupational environment; however, it is not free from ergonomic derangement. The biscuit factory workers are exposed to noise, heat, odor, flour dust, sugar dust, and biscuit dust

Methods: A cross-sectional study was conducted on all males and females of more than 18 years of age among employees of a biscuit company in Puducherry City, India, who met the inclusion criteria. According to previous research, the sample size was calculated at 494. We used the simple random sampling method. The data regarding participants' sociodemographic variables, namely dietary patterns, physical activity, and addictions (including alcohol and smoking) were recorded using a pretested semi-structured questionnaire. The statistical analysis was done in the SPSS software, version 28.

Results: Most of the participants (41.8%) were in the productive age group (18 to 30 years). The prevalence of hypertension and diabetes mellitus was 62.69% and 37.31%, respectively. Skin disorders (14.2%) were shown to be the most common cause of morbidities, followed by dental morbidity at 13.4%. Meanwhile, the least of the participants were in musculoskeletal morbidity (10%). There was an association between mixed diet, physical inactivity, alcoholic and tobacco consumption, and fruit consumption of fewer than 2 days per week with noncommunicable diseases. These differences were statistically significant ($P \leq 0.05$).

Conclusion: The employees of the biscuit factory are exposed to chemicals that may be linked to morbidities. The non-communicable diseases were also more prevalent among tobacco and alcohol users, suggesting more research to determine whether these behaviors were stress busters for tension and discomfort. Nearly all of the employees in the companies had undergone a sort of medical examination in recent years. This shows that the workplace has high safety and sanitary requirements.

Keywords: Morbidity pattern, Noncommunicable diseases, Biscuit factory

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1. Introduction

Although the baking profession has certain ergonomic issues, it is not a particularly dangerous industry to work in. The biscuit factory is noisy, hot, smelly, and full of biscuits, flour, and sugar dust. Cardiovascular diseases are becoming more common in developing countries, such as India, because of epidemiologic transitions [1].

Noncommunicable diseases accounted for 53% of deaths and 44% of lost disability-adjusted life years in India [2]. All risk factors must be addressed holistically, including hypertension, diabetes, smoking, increased blood lipids, physical inactivity, obesity, and favorable family history. Diabetes mellitus and hypertension, two common adolescent illnesses that predispose individuals to a wide range of cardiovascular problems, are significant public health concerns [3]. Low and middle-income countries are disproportionately affected by cardiovascular disease, comprising almost 80% of deaths. In 2014, heart disease and stroke were among the top 3 mortality causes, contributing to over a decade of lost life [4]. By 2030, 23.3 million people will die from cardiovascular disease, most of which are due to heart disease and stroke [5]. Over the last 4 decades, the rate of deaths because of cardiovascular diseases has dropped in high-income countries due to reduced cardiovascular disease risk factors and improved healthcare. According to recent studies, despite having fewer risk factors, low-income countries have much higher cardiovascular diseases and mortality rates compared to high-income countries [4]. Cardiovascular disease mortality rates in South Asian countries are much higher compared to East Asian countries [6]. High blood pressure, cholesterol, obesity, tobacco usage, lack of physical activity, and diabetes are all risk factors that can be controlled, treated, or adjusted. However, several critical cardiovascular disease risk factors are uncontrollable and continue to rise. No large-scale, properly conducted epidemiological studies of industrial workers are available. Accordingly, this study aims to explore the dietary pattern, physical activity, and addictions prevalence among workers of biscuit companies and their morbidity pattern.

Study objectives

This study aims to investigate the prevalence and distribution pattern of various morbidities among biscuit manufacturing industry workers in Puducherry City, India.

This study aims to estimate the prevalence of risk factors for cardiovascular diseases among workers of biscuit companies.

2. Methods

This cross-sectional study was conducted from September 2020 to March 2021 (6 months) among all adult male and female employees in a biscuit company in Thirubuvanai, Puducherry City, India. The participants were interviewed at their workplaces. All adult males and females older than 18 years, who gave their approval to participate in this research were included. Workers who were absent from the workplace at the interview time were excluded from the study. In total, there were almost 1500 employees of the biscuit company in Puducherry City, India. Based on a study by Kaur et al. [7], considering diabetes with the least prevalence in India, at 16.3% and 20% precision, the sample size was obtained at 494. The medical evaluation had to be accessible to every participant in the industrial unit. After obtaining the informed consent letter, information on sociodemographic factors, dietary patterns, physical activity, and addictions (such as alcohol and smoking) were collected using a pretested semi-structured questionnaire. The information was collected and entered into a Microsoft Excel spreadsheet. The SPSS software, version 28.0, was used to conduct the data analysis. Continuous variables were represented as mean and Standard Deviation (SD), while categorical variables were reported as frequency and percentages. The Chi-square test was used to identify various noncommunicable disease risk variables. The statistical significance was defined as a P of less than 0.05.

Operational definitions

Noncommunicable diseases

Noncommunicable diseases (NCDs) are progressing chronic illnesses with a history of the known case of hypertension and diabetes [8].

Physical activity

The participants should actively exercise for 2 or more days a week, equal to at least 150 to 300 min per week of physical activity [9].

3. Results

The association between the risk factors and NCDs is provided in Table 1. Among the participants, individuals who consumed fruit more than 4 times per week had a lesser chance of having NCDs. Meanwhile, the prevalence of junk food consumption was 97.16%. The association of age, gender, type of diet, physical activity, alcohol, smoking, and number of fruit consumption per week with NCDs were found to be statistically significant ($P \leq 0.05$). In contrast, the association of junk food consumption with NCDs was not statistically significant.

Table 1. Association between risk factors and non-communicable diseases (n = 67)

No.	Variables	Parameters	No. (%)		P
			NCDs: Present	NCDs: Absent	
1	Age (y)	18 - 30	28(41.8)	187(43.8)	0.984**
		31 - 40	22(32.8)	137(32.1)	
		41 - 50	13(19.4)	76(17.8)	
		Above 51	4(6)	27(6.3)	
2	Gender	Male	37(55.2)	217(50.8)	0.295**
		Female	30(44.8)	210(49.2)	
3	Education	Primary school certificate	7(10.4)	15(3.5)	<0.001*
		Middle school certificate	14(20.9)	32(7.5)	
		High school certificate	28(41.8)	160(37.5)	
		Intermediate	8(11.9)	40(9.4)	
		Post high school diploma	4(6)	10(2.3)	
		Undergraduate or graduate	6(9)	170(39.8)	
4	Occupation	Skilled	56(83.6)	370(86.7)	0.002**
		Unskilled	5(7.5)	50(11.7)	
		Semi-skilled	6(9)	7(1.6)	
5	Type of diet	Vegetarian	11(16.4)	6(1.4)	<0.001**
		Mixed	56(83.6)	421(98.6)	
6	Physical activity	Yes	66(98)	377(88.3)	<0.001*
		No	1(2)	50(11.7)	
7	Alcohol consumption	Yes	16(23.9)	64(15)	0.05**
		No	51(76.1)	363(85)	
8	Tobacco usage	Yes	31(46.3)	103(24.1)	< 0.001**
		No	36(53.7)	324(75.9)	
9	Fruit consumption frequency per week	1	2(2.98)	31(7.25)	<0.001*
		2	43(64.17)	158(37)	
		3	14(20.89)	125(29.27)	
		4	1(1.49)	86(20.14)	
		5	3(4.47)	15(3.5)	
		6	2(2.98)	11(2.57)	
		7	3(4.47)	1(0.23)	
10	Junk food consumption frequency per week	1	34(50.7)	206(48.2)	0.071*
		2	20(29.9)	142(33.3)	
		3	5(8.9)	49(11.5)	
		4	6(9)	11(2.6)	
		5	1(1.49)	6(1.4)	
		No junk food consumption	1(1.49)	13(3)	

*The P was tested by the Fisher exact test; **The P was tested by the Chi-square test.

The morbidity pattern of the participants is provided in Figure 1. Skin disorders (14.2%) were the most common cause of morbidities, followed by dental morbidity at 13.4%, and the least of the participants were in musculoskeletal morbidity (10%).

The distribution of participants with NCDs is provided in Figure 2. Most participants had hypertension (62.69%), followed by the participants who had diabetes mellitus (37.31%).

4. Discussion

Our study comprised industrial workers in the age range of 18 to 59 years and aimed to assess the prevalence of cardiovascular disease risk factors and the distribution pattern of various morbidities in an industrial setting. The majority of participants had a high school (38.05%) and graduate (35.62%) diploma, similar to the study done by Subitha et al. [10] on female textile workers in Puducherry City, India. It was comparatively less than the study done by Prabhakaran et al. [11] in Northern India with participants who had graduate degrees at 66.4%. The disparities between our study and others could be attributed to differences in methodology, socio-

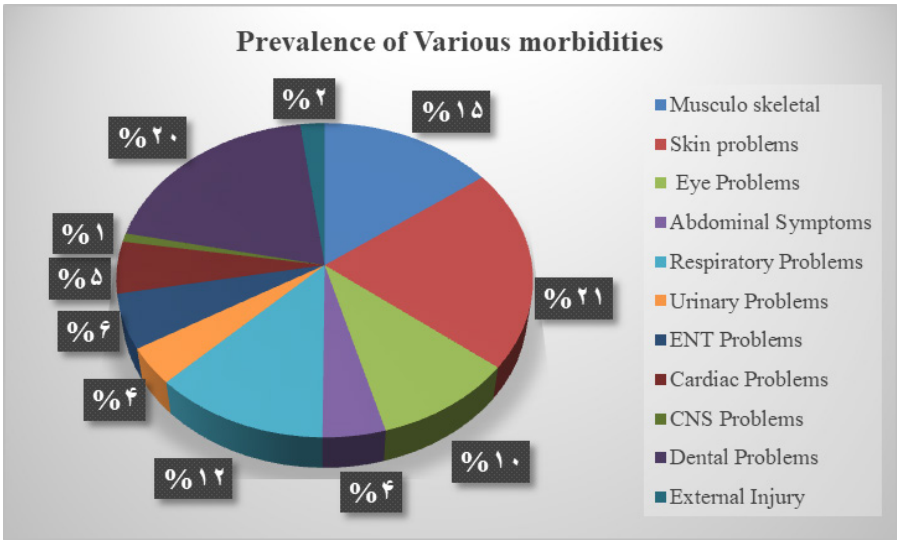

Figure 1. Morbidity pattern of the study participants (n = 494)

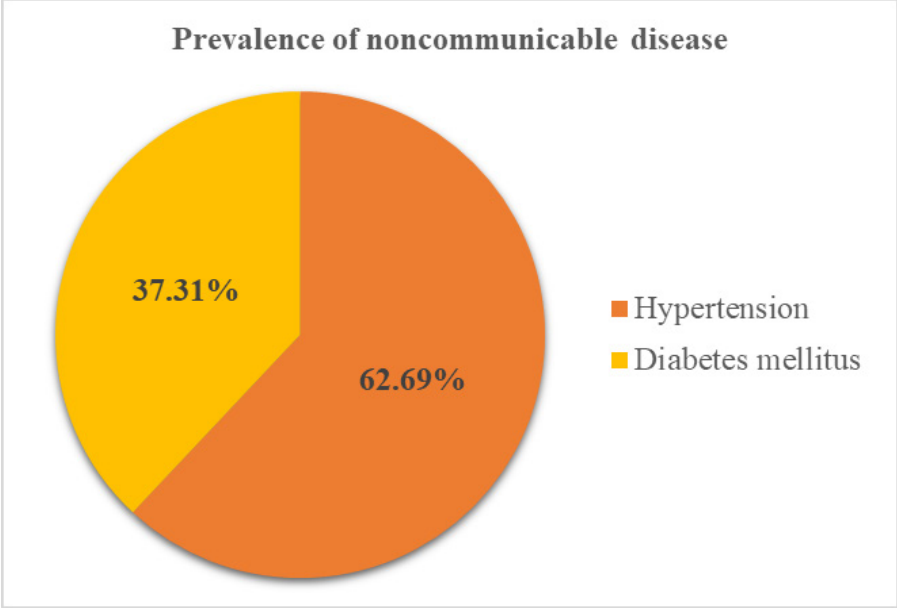

Figure 2. Distribution of participants with noncommunicable diseases (n = 67)

economic, and demographic factors. Our study found a statistical association between NCDs and physical activity, fruit consumption, alcohol consumption habits, tobacco usage habits, and the type of diet the participants had. Physical inactivity was 10.1% in our study participants, whereas in a study done by Gupta et al. [12], this rate was reported at 85% for the prevalence of physical activity because of work engagement. This could be due to the different characteristics of industrial settings. Fruit consumption more than 4 times per week was associated with a lower risk of acquiring NCDs in our study. South Asians have a lower prevalence of vegetables and food intake compared to the rest of the world, according to an INTERHEART study. Junk food consumption was equal to 97.16 % in our study. A study conducted by Bahar Azemati et al. [13] among Iranian adolescents found that junk food consumption is associated with a risk for high blood pressure. Traditional plant-based diets are being replaced with calorie-dense, high-fat meals, which are less nutritious. Saturated and trans-saturated fatty acids are consumed in large quantities. To enhance fruit and vegetable consumption, we must raise awareness among Indians. Skin problems (27%) were the major morbidity pattern in our study, similar to the results of Adsul et al. [14]. In comparison to our study,Jayakrishnan et al. [15] found that only 16.1% of the participants had skin disorders. Our study's high prevalence of morbidity patterns could be due to the low usage of protective devices, a lack of workplace safety measures, increasing smoking habits, tobacco chewing, alcohol consumption, unsanitary practices, and so on.

5. Conclusion

The employees of the biscuit factory are exposed to chemicals that may be linked to morbidities. NCDs were more prevalent among tobacco and alcohol users, suggesting more research to determine whether these behaviors were stress busters for tension and discomfort. Nearly all of the employees in the companies have undergone a sort of medical examination in recent years. This shows that the workplace has high safety and sanitary requirements. Awareness is created about their health in society.

Ethical Considerations

Compliance with ethical guidelines

All ethical principles were considered in this article. The study was approved by the Research Ethics Committees of Aarupadai Veedu Medical College (IEC NO. AV/IEC/2020/107). Written consent was obtained from the participants before the data collection.

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Authors' contributions

Manuscript writing, data collection, and interpretation: Aumrin Fathima; Conceptualization and supervision, Analysis: Arun Daniel.

Conflict of interest

The authors declare no conflict of interest.

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