NON COMMUNICABLE DISEASES RISK FACTORS AMONG LEATHER FACTORY WORKERS – A CROSS SECTIONAL STUDY

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ABSTRACT: RESEARCH QUESTION: What is the burden of non communicable risk factors among a working population in an occupational health setting?

OBJECTIVES:

1. To estimate the prevalence of various risk factors of non communicable diseases among leather factory workers.
2. To assess the association of risk factors with overweight and obesity.

DESIGN: The study was done as a cross sectional study among factory workers situated near National Highways, in South Chennai during June and July 2012 using questionnaire and interview method after getting informed consent. The questionnaire included socio demographic profile, lifestyle behavior, smoking and alcohol history, family history of diabetes etc. The data was analyzed using Epi-info software and the test of significance was assessed by Chi-square test.

SETTING: The study was done in the factory premises itself as a regular health check up camp. After getting the permission from the concerned authorities the questionnaire was administered to the study participants. **PARTICIPANTS:** The study participants were employees of the factory aged 18 years and above and both sexes. **OUTCOME MEASURES:** Prevalence of risk factors among the factory employees and the secondary outcome measure is association between the risk factor and the obesity. **RESULTS:** Totally 118 workers were included in the study of which, Tobacco usage was present among 32 (27.1%), alcoholic history in 37 (31.4%), lack of regular physical activity among 80 (67.8%), overweight and obese was present among 41 (34.7%) and abdominal fat accumulation was seen in 20 (16.9%) of the study population. Overweight and Obesity was significantly ($p < 0.05$) associated with increasing age and socioeconomic status in this study.

CONCLUSIONS: Our study showed high rates of risk factors like alcohol consumption, tobacco usage and prevalence of obesity which stresses the importance of major lifestyle changes.

KEY WORDS: Non – Communicable Disease, Risk factors, Tobacco usage, Overweight and Obesity, alcohol history, Waist Hip ratio, physical inactivity

INTRODUCTION: Chronic non communicable diseases are assuming increasing importance among adult population in both developed and developing countries. The prevalence of non communicable diseases is increasing in most countries, and for several reasons this trend is likely to increase. The reason for this increase in trend can be attributed to greater number of people living to older ages, lifestyles and behavioral patterns of people are changing rapidly, which are favorable to non communicable diseases. Most of the researchers accept that sets of risk factors are responsible for a major share of adult non communicable disease morbidity and premature mortality. The risk

factors are tobacco usage, insufficient physical activity, harmful use of alcohol, unhealthy diet, raised blood pressure, overweight and obesity, raised cholesterol and environmental risk factors such as occupational hazards, water and air pollution. These risk factors are on the rise and because of this the impact of this group of diseases on the lives of people is serious which affects the people in terms of loss of life, disability, problems in families, poverty and economic loss. There were 57 million global deaths in 2008, 36 million or 63% were due to non communicable diseases. By cause, cardiovascular diseases were responsible for the largest proportion of non communicable disease deaths (47.9%), followed by cancers (21%), chronic respiratory diseases (11.72%), digestive diseases (6.1%), diabetes (3.5%) and rest of the non communicable diseases were responsible for 9.78% of deaths. As population will age, annual NCD deaths are projected to rise substantially, to 52 million in 2030. In Low and middle income countries non communicable diseases will be responsible for three times as many Disability Adjusted Life Years (DALYs) and nearly five times as many deaths as communicable diseases, maternal, peri-natal and nutritional conditions combined (1,2).

India is experiencing a rapid health transition with a rising burden of non communicable diseases causing significant mortality and morbidity, both in urban and rural population, with considerable loss in potentially productive years of life and it accounts for about 53% of all deaths in India (3).

A large percentage of non communicable diseases are preventable through changes in these risk factors. So targeting the risk factors for non communicable diseases is recognized as an essential preventive strategy to reduce the occurrence. But currently there is lack of good quality data on prevalence of non communicable diseases risk factors (4). Approach to surveillance of these risk factors is of important first step for prevention and control of non communicable diseases. The present study was designed to assess non communicable diseases risk factors.

AIMS AND OBJECTIVES:

1. To estimate the prevalence of various risk factors of non communicable diseases among leather factory workers.
2. To assess the association of risk factors with overweight and obesity.

MATERIALS AND METHODS: We conducted a cross sectional study among the leather factory workers situated near Velappanchavadi, Chennai during June and July 2012. As a part of regular health check up and medical camp, this study was conducted after getting the prior permission from the factory authorities. The data was collected using WHO STEP questionnaire and each of the persons was interviewed after getting the informed consent. The WHO STEP-wise tool was used and the behavioral risk factor Questionnaire was suitably modified and translated in local language (5). It included questions on socio-demographic status, data on tobacco and alcohol use, measures of dietary habits and physical inactivity. Standard procedure was followed as per STEPs protocol for anthropometric and blood pressure measurements. The questionnaire and interview was followed by measurement of Height, weight, measurement of blood pressure, random capillary blood sugar and a routine clinical examination. The measurements were done using standardized instruments and were quality checked before conducting the study. The objectives of the study were explained to the study participants before administering the questionnaire.

DEFINITIONS:

Tobacco usage: Current daily smokers were defined as those who were currently smoking cigarettes, bidis or hookah daily. Current daily smokeless tobacco users were defined as those who were currently using chewable tobacco products, gutka, naswar, khaini or zarda paan daily.

Alcohol history: Current alcohol drinkers were defined as those who reported to consuming alcohol within the past one year.

Physical inactivity: Sitting or reclining at work, at home, getting to and from places, or with friends including time spent sitting at a desk, sitting with friends, traveling in car, bus, train, reading, playing cards or watching television, but do not include time spent sleeping.

Dietary habits: Those who eat only vegetarian diet were considered as Vegetarian, those who eat both animal food and vegetarian diet were classified as Non vegetarian.

Body mass index (BMI) was calculated by dividing the weight (in kilograms) by square of height (in meters), Overweight was defined as BMI $< 25 \text{ kg/m}^2$ and $< 30 \text{ kg/m}^2$ Obesity was defined as BMI $\geq 30 \text{ kg/m}^2$.

Waist Hip ratio was calculated by Waist circumference divided by Hips circumference and the cutoff of > 1 in men and > 0.85 in women was considered as abdominal fat accumulation.

Hypertension was defined as BP $\geq 140/\geq 90$ mm of Hg or currently on antihypertensive drugs.

Data was entered in MS excel sheet and the analysis was done using EPIINFO software version 3.5, 2008.

Ethical issues: The study does not involve any experiment on human subjects, and involved only questionnaire and interview method with some measurements on the study population; no ethical issues were considered in this study.

Funding and data sharing: No funding from external agency and there was no data sharing with any other organization or agency.

RESULTS: Totally 118 study participants were interviewed of which majority 83 (70.3%) were males and most of them 64 (54.2%) belonged to 18 to 30 years. The mean age of the study population was 32.25 and 31 (26.3%) belonged to class I and II socioeconomic status according to BG Prasad Classification. Family history of diabetes, hypertension or Ischemic heart disease was seen among 47 (39.8%). Tobacco usage was present among 32 (27.1%), alcoholic history was seen in 37 (31.4%), lack of regular physical activity was present among 80 (67.8%), 99 (83.8%) watch television for an average of 1.7 hours per day (Supplemental - Table 1).

The prevalence of overweight and obese was present among 37 (31.3%) and 4 (3.4%), and abdominal fat accumulation (waist hip ratio) was seen in 20 (16.9%) of the study population (Supplemental Table 2, Supplemental Figure 1). Among the study participants 8 (6.7%), were diagnosed as hypertensive, 6 (5.08%) were diagnosed as diabetes mellitus according to random capillary blood sugar more than 200 mg /dl and 5 (4.2%) were known diabetes and hypertensive on treatment. A significant correlation of Obesity and overweight with increasing age and increasing income was seen in this study ($P < 0.01$).

DISCUSSION: The present study shows that the risk factors of non communicable diseases were very high as compared to other studies. Our study showed that tobacco usage was 27% among males, which is high compared to Bhardwaj et al study (6) at Nagpur India which showed 20.5%,

Anand K et al (7) in Fariabad which was 22.2% and Kutty V et al (8) in Thiruvandhapuram. However study conducted in rural area of Faridabad by Krishnan A et al (9) showed high prevalence of current smokers, 41.0% in men and 13.0 % among women while the prevalence of smokeless tobacco was 7.1 % and 1.2% among men and women respectively. Similarly our study showed that 7.6% were using smokeless tobacco. The smokeless tobacco used by our study participants were Gutkha, panparag and Hans. In our study the current alcohol users were 31.4%, which is less when compared to Bhardwaj et al study (6) where it was 37%. Our study showed that only 12.7% of the study participants were only vegetarians and lack of physical activity more commonly present which can be attributed to lack of awareness and ignorance. During leisure time most of them watch television and sitting with computer. Our study revealed the prevalence of overweight and obesity was 37 (31.3%) and 4 (3.4%), but waist hip ratio results showed that more number of females 19 (54.2%) were having abdominal fat accumulation than males which was 1 (1.2%) (Supplemental Table 3 and Supplemental Table 4). This was low when compared to a Jaipur study of Gupta R et al (10), which showed 54.5% of obesity and 61% of abdominal fat accumulation.

CONCLUSION: There is a significant prevalence of risk factors of non communicable diseases was evident in the study population. Overweight and Obesity being the major risk factor for non communicable diseases, which was significantly correlated with increasing age and increasing income in this study.

LIMITATIONS: The study was not a community based study, so the results might not be extrapolated to any of the specific population.

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Table - 1 frequency distribution of study participants with respect to the variables

Variable	Frequency	Percentage
Age grouping		
18 to 30 years	64	54.2
31 yrs and above	54	45.8
Gender		
Female	35	29.7
Male	83	70.3
Education Grouping		
Diploma	8	6.8
Graduate	36	30.5
High school	70	59.3
Illiterate	4	3.4
Socio economic status		
Class I	12	10.2
Class II	19	16.1
Class III	12	10.2
Class IV	26	22.0
Class V	49	41.5
H/O of Any Chronic illness		
Yes	20	16.9
No	98	83.1
Family history of DM/HT/IHD		
No	71	60.2
Yes	47	39.8
Smoking History		
No	95	80.5
Yes	23	19.5
Smokeless tobacco usage		
No	109	92.4
Yes (Gutkha, Hans, Panparag)	9	7.6
Dietary habits		
Mixed diet eaters (VEG AND NONVEG)	103	87.3
Only vegetarian eaters	15	12.7
Regular physical activity		
No	80	67.8
Yes	38	31.2
Outdoor playing		
No	79	66.9
Yes	39	32.1

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TABLE – 2 - OBESITY INDICES

WHO classification of obesity by BMI (Quetlet's Index)	Frequency	Percentage
Normal	65	55.1
Overweight and obese	41	34.7
Underweight	12	10.2
Total	118	100.0%
Waist Hip Ratio Classification (cut off Male >1 and for females > 0.85)	Frequency	Percentage
Abdominal fat accumulation – Present	20	16.9
Normal	98	83.1
Total	118	100.0%

TABLE – 3 - AGE AND GENDER DISTRIBUTION OF BODY MASS INDEX

Gender			Body Mass Index			Total
			Normal	Overweight and obesity	Underweight	
Female	Age Group	18. to 30. yr	12	4	4	20
		31. yr and above	6	9	0	15
	Total		18	13	4	35
Male	Age Group	18. to 30. yr	24	13	7	44
		31. yr and above	23	15	1	39
	Total		47	28	8	83

TABLE – 4 - AGE AND GENDER DISTRIBUTION OF WAIST HIP RATIO

Gender			Waist Hip Ratio Classification		Total
			Abdominal fat accumulation	Normal	
Female	Age Group	18. to 30. yr	8	12	20
		31. yr and above	11	4	15
	Total		19	16	35
Male	Age Group	18. to 30. yr	0	44	44
		31. yr and above	1	38	39
	Total		1	82	83

FIGURE – 1
PREVALENCE OF OBESITY ACCORDING TO BODY MASS INDEX

FIGURE – 2

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