A Cross Sectional Study on Occupational Health Hazards and its Correlates among Workers in Small Scale Factories, Puducherry

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ABSTRACT

To assess the health status of the workers in small scale factories in the study area. To identify the exposure of workers to the occupational hazards in them workplace. To study the association between occupational hazards and systemic health problems among the workers.

1.   Introduction

The Industrial Revolution showed a conspicuous phase of ripening in the hindmost fragment of the early 19th century that transmogrified bucolic societies of Europe and America into Industrialised civic ones. Commodities that had been assiduously crafted by hand, kicked off to be fabricated in abundance by machines in Industries. This was boarded up by the ground breaking use of steam power thus setting the Revolution in Industries in Britain, mushrooming to the rest of the World by 1830s & 40s. Concurrently even as industrialisation escalated the Economic yield and enhanced the quality of living for the middle and upper class, Poverty striken and working class people resumed to grapple. The Labour initiated by the technological upheaval had made performance in factories progressively monotonous and at times treacherous. Many workers were exacted to work long hours for paltry wages, heading to exploitation of labour, resulting in conflict between the bourqeois and the Proletariat1.

As the Industrial Revolution moved along, Socialist pundit reproached Capitalism for the hardship of the Proletariat, following which Communism grew out in the 19th century. Ensuing World War II in the mid-20th century, people began to substantiate Globalization of World Economy, where it is no secret that the World of Work is abstruse. Globalisation influences the design of workplaces, the course of action being executed and occupational safety and health (OSH). Regardless of considerable treads ameliorating OSH since the past centenary, 317 million non-lethal occupational injuries and 321,000 occupational fatalities has been conjectured Globally every year, which means 151 workers sustain a work associated accident every 15 seconds. Impoverished workplace safety and health adds to substantial freight on employers. International Security Association has insuinated that expenditure affliated with nonfatal workplace accidents alone twins roughly 4% of World GDP each year2(ISSA 2014: safe work 2012).

Albeit practically every single job entails certain likelihood for injury, the immensity of risk extends amply across job limits, Geographic precincts and Although the sequel of Mondialisation has been mixed, Occupational Injury rates have shown to soar in Low and Middle Income countries and fade in high Income Countries. India has reported 17 million Occupational Non-fatal injuries (17% of the World) and 45,000 fatal injuries (45% of the total deaths due to occupational Injuries in World) each year. Out of 11 million cases of Occupational diseases in the

World, 1.9 million cases (17%) are contributed by India and out of 0.7 million deaths in the World 0.12(17%) is contributed by India3.

In Developing Country Such as India, Small and Medium Enterprises are often the paramount of the economy. Small & Medium Enterprises alone contribute to 7% of India's Gross Domestic Product. They account 90% of the Industrial component and bestow 35% of India's Exports. The SME sector of India is contemplated as of Economy granting employment to about 60 million people, creating 1.3million jobs every year. As per Annual report 2018-2019 on MSME, distribution of small sector enterprises is 3.31 lakh with 0.78 lakh belonging to rural and 2.53 lakh in Urban.

The Educational level and Socio-Economic status of SSE workers vary comprehensively but on many occasions lower than the averages for the whole workplace. Of specific significance, the owners/Managers may have had little knock up in operation and management and even less in the recognition, prevention and control of Occupational health risks and environment. Even where pertinent educational resources are made available, they often have the paucity of time, energy and resources to make use of them. With the esteem of being a backer amiable, the UT of Puducherry has authentic documentation of alluring surfeit outlay and has witnessed electrifying Industrial Growth over the years. Puducherry has 6964 SSE4 which are deemed to be the life belt of Puducherry Economy. While Evolution in Technology have minimized some hazards at the workplace, Occupational injury, illness and workplace facilities are important Public health concerns. Many studies have chronicled that the burden of Occupational injuries and illness is not in alike dispersal across the Labour force.

Consideration of Vulnerability only in terms of Individual Demographic, Job or Workplace characteristics is skimpy and absurd as it doesn't fairly consider how the distinct circumstances of the workers put up on their Occupational health and safety. This study computed the vulnerability compendiously and scrutinize its relation with demographic profile, Behavioral determinants, Physical and mental status of workers in Small Scale Factories.

It is a known fact that workers in small scale factories have a hard physically challenging job. Working under machines, being on their feet all day and straining their backs nd muscles, workers face a number of occupational hazards on daily basis. According to WHO, annually 2.9 billion workers across the Globe are exposed to workplace hazards. In addition to injuries, nearly 100 occupational diseases have been classified according to the tenth revision of International Classification of Diseases and related health problems (ICD-10). Broadly these include respiratory, musculoskeletal, skin and psychological disorders5. These on long term leads to sickness absenteeism and loss of productivity resulting in Economic loss.

This study was conducted to assess health status, environment and to figure out the association between occupational hazards and work profile of the workers in Small Scale Industries, Puducherry. Various researchers all over World, has studied the occupational hazards in small scale industries. However, there are not many studies done in Puducherry related to these aspects. This study would give an insight to fill the gap existing in the occupational health system and thus exploring ways to bridge this gap.

2. Materials And Methods

Study design:
This was a cross- sectional study conducted among workers in small scale factories at Puducherry.

Study setting and study period:
The study was conducted from September 10th 2018 to June 31st 2019 in the small scale factories at Villianur, which is one of the catchment area of SLIMS, Puducherry.

Study population:
The workers employed in the small scale factories.

Sample size:
The sample size was calculated based on the previous study conducted by Prabha Thangaraj et al31, where the prevalence of occupational health hazards recorded in the study was 58.8%. This was taken as the reference value for calculating sample size for this study and was calculated using the formula,

$N = Z\alpha2pq/(L)2$

Where,

Z = 1.96 at a confidence interval of 95%

P = 58.8

q = 100 - 58.8

  = 41.2

L = relative precision, which is assigned as 10% of p for this study

= 5.88

Substituting the values in the formula,

N = (1.96 * 1.96* 58.8*41.2) / (5.88*5.88)

= 9306.5064 / 34.57

=269

Considering, 10% for the Non response rate N = 295

The sample size calculated was 269. By adding 10% for non-response rate and the final sample size derived were 295 which was rounded off to 300. [N = 300]

Inclusion criteria:
The workers present in the factory during the survey.

Exclusion criteria:
The workers who didn't give their consent for the study were excluded.

Sampling technique:
Villianur Taluk is located in Puducherry District. It is one among the 4 Taluks. The area of Villianur Taluk is 130.40 sq.km with population density of 1636 per sq.km. registered clusters of micro and small enterprises are there in UT of Puducherry. Some potential clusters available includes Plastic, Corrugated box, Fragrance industries. Considering approximately 50 small scale enterprises in Villianur, 9 factories were chosen by systematic random sampling method. 35 samples from each Industry were selected using simple random sampling method using the

lottery method with the help attendance registry maintained in the factories to arrive at the sampling frame.

Study tool:
A pretested questionnaire was used as a study stool for the data collection. The validity of the tool was assessed by consultation with expert opinion. The questionnaire was prepared in English and was translated to the local language during the interview and the responses were collected by the interview herself. The questionnaire comprised of six sections.

Section i: socio demography details.
This section comprised of Personal details, including age, gender, religion, education status and the socio- demographic details such as Income, marital status, type of family, family members and the state of origin.

Section ii: behavioural determinants.
This includes the behavioral determinants of the workers which include the habits of smoking, alcohol intake, and dietary habits and sleep pattern.
The AUDIT - C was used to assess alcohol dependence. The AUDIT-C is an alcohol screen that helps to identify persons who are hazardous drinkers or have active alcohol use disorders (including alcohol abuse or dependence). The AUDIT-C is a modified version of the 10 question AUDIT instrument.

Audit-c questionnaire:
1.   How often do you have a drink containingalcohol?
a.   Never
b.   Monthly orless
c.   2-4 times aweek
d.   2-3 times aweek
e.   4 or more times aweek
2.   How many standard drinks containing alcohol do you have on a typicalday?
a.   1 or 2
b.   3 or 4
c.   5 or 6
d.   7 or 9
e.   10 ormore
3.   How often do you have six or more drinks on one occasion?
a.   Never
b.   Less thanmonthly
c.   Monthly
d.   Weekly
e.   Daily or almost daily

Scoring:
The AUDIT-C is scored on a scale of 0-12
Each AUDIT-C question has 5 answer choices. Points allotted are: a = 0 points, b = 1 point, c = 2 points, d = 3 points, e = 4 points

In MEN, a score of 4 or more is considered positive, optimal for identifying hazardous drinking or active alcohol use disorders.

In WOMEN, a score of 3 or more is considered positive (same as above).

However, when the points are all from question #1 alone (#2 & #3 are zero), it can be assumed that the patient is drinking below the recommended limits and it is suggested that the provider review the patient's alcohol intake over the past few months to confirm accuracy.

Generally, the higher the score, the more likely it is that the patient's drinking is affecting his or her safety.

Similarly, Fagerstrom scale was used to assess the Nicotine Dependence. The questionnaire is as follows,

Do you currently smoke cigarettes?

1)   No   2)   Yes

1.   How soon after you wake up do you smoke your firstcigarette?
1)   Within5 minutes   3)   31 - 60minutes
2)   6 -30 minutes   4)   after 60minutes
2.   Do you find it difficult to refrain from smoking in places where it is forbidden (e.g., in church, at the library, in thecinema)?
1)   No   2)   Yes
3.   Which cigarette would you hate most to giveup?

1)   The first one inthemorning   2)   Anyother
4.   How many cigarettes per day do yousmoke?
1)   10orless   3)   21 to 30

2)   11 to 20   4)   31 ormore
5.   Do you smoke more frequently during the first hours after waking than during the rest of theday?
1)   No   2)   Yes
2)   Do you smoke when yoy are so ill that you are in bed most of theday?
3)   No   3)   Yes

Section iii: Work Profile

This section comprises of the working nature of the study population comprising of place of occupation, type of work, Technical qualification, experience of work, work shift, nature of work, pre-employment medical screening and periodic medical check-up.

Section IV: Workplace Hazards.

This section asks the kinds of health and safety hazards that the workers are exposed in their job. The questions in this section are based on the OHS vulnerability measure developed by the Institute of Work & Health, a not-for-profit organization based in Toronto, Canada. The main aim of this measure is to promote, protect and improve the safety and health of working people.

Section V: Physical Health

It includes the self-reporting of ocular problems, oral cavity problems, ENT related complaints, cardiac problems, respiratory related problems, gastro intestinal problems, nervous problems, urinary problems, musculoskeletal problems, skin problems.

Section VI: Mental Health Status

This section assesses the mental health status of the workers, which is based on "THE WORKPLACE STRESS SCALE", of The Marlin Company, North Haven, CT and the American Institute of stress, Yonkers, NY.

QUESTIONS	Never	Rarely	Sometimes	Often	Very Often
1. Conditions at work are unpleasant or sometimes even unsafe.					
2. I feel that my job is negatively affecting my physical or emotional well being					
3. I have too much work to do and/or too many unreasonable deadliness					
4. I find it difficult to express my opinions or feelings about my job conditions to my superiors.					
5. I feel that job pressures interfere with my family or personal life.					
6. I have adequate control or input over my work duties.					
7. I receive appropriate recognition or rewards for good performance.					
8. I am able to utilize my skills and talents to the fullest extent at work.					

Interpretation:
- Total score of 15or less   - chilled out or relativelycalm
- Total score of 16to 20   - Fairlylow

- Total score of 21to 25   - Moderatestress
- Total score of 26to 30   -Severe
- Total score of 31to 40   - Stress level is potentiallyhigh

Section VI: Job Satisfaction Assessment

This section consists of questions to assess the satisfactory level of their job which is based on The Generic Job Satisfaction scale37.

Interpretation:

Total score of 42to 50   -   Very high
Total score of 39 to 41   -   High
Total score of 32 to 38   -   Average
Total score of 27 to 31   -   Low
Total score of 10 to 20   -   Very low

Informed Consent:

The nature of the study was explained to the workers and the consent, which was prepared in the local language, was obtained from each participant prior to the interview session.

Ethical approval:

The proposal of the study was presented and was approved by the Institutional Ethics Committee prior to the pretesting. The approval letter is enclosed in [Annexure - 1].

Data collection period:

Data was collected from the study participants for a period of 3 months from 2nd December 2018 to 28th February 2019.

Data collection method:

The data was collected by interviewing the workers as per our inclusion criteria using the proforma in the respective factories. The questionnaire was prepared in English and orally translated to local language (Tamil) while conducting the interview. The interview was conducted by the investigator himself and their responses were recorded in the questionnaire [Annexure III]

Operational definitions:

Age: Age was recorded to the nearest completed year as per information provided by the study subject.

1.   Religion: The subject's religion was noted and was grouped as "Hindu", "Muslim", "Christian"

2.   Education Classification:[33]

Education was classified based on modified kuppusamy classification 2017 as illiterate, primary school, middle school, high school, high secondary school, graduate, postgraduate and professional.

3.   FamilyType:[33]

Family type was divided into 3 categories as nuclear family, joint family and three generation family.

4.   Socioeconomic status:[34]

Socioeconomic status was classified based on Modified BG Prasad's classification 2017 as upper, upper middle, middle, lower middle and lower.

5.   Migrant:[35]

Persons who are outside the territory of the state of which they are nationals or citizens are not subject to its legal protection and are in the territory of another state.

6.   Occupationalhazard:[36]

The potential risks to life or functioning of an individual that is inherently associated with his occupation or work environment. Some of these hazards resulted in contraction of a disease or the loss of functionality or death.

3.   Statistical analysis:

The statistical analysis of data was done using descriptive and analytical statistics. The descriptive statistics analyzed were presented in the form of frequency distribution and percentage. The analytical statistics used were chi- square. The association of occupational hazards with work profile of the workers in small scale industries was assessed. P value < 0.05 was considered to be statistically significant. Data was entered in Microsoft Excel and analyzed using the software SPAA, version 22.

TABLE 1: Distribution Of Sociodemographic Profile Of The Study Population

S NO	VARIABLES		FREQUENCY (N=300)	PERCENTAGE
1.	AGE CATEGORY	15 - 24 Yrs	46	15.3%
		25 - 34 Yrs	122	40.7%
		35 - 44 Yrs	92	30.7%
		45 - 54 Yrs	35	11.7%
		>= 55 Yrs	5	1.7%
2.	GENDER	MALE	169	55.7%
		FEMALE	133	44.3%
3.	RELIGION	HINDU	283	94.3%
		CHRISTIAN	11	3.6%
		MUSLIM	6	2%
4.	EDUCATION	ILLITERATE	29	9.7%
		PRIMARY	14	4.7%
		MIDDLE	45	15%
		HIGH	87	29%
		HIGHER SECONDARY	53	17.7%
		GRADUATE	72	24%
5.	SOCIOECONOMIC STATUS	CLASS I	28	9.3%
		CLASS II	107	35.7%
		CLASS III	123	41%
		CLASS IV	38	12.7%
		CLASS V	4	1.3%
6.	TYPE OF FAMILY	NUCLEAR	251	83.7%
		JOINT	21	7%
		THREE	28	9.3%

		GENERATION		
7.	MARITAL STATUS	MARRIED	213	71%
		UNMARRIED	80	26.7%
		DIVORCED	1	0.3%
		WIDOWER	6	2%

The Table 1 shows the Distribution of Sociodemographic profile of the study participants. 40.7% (n=122) ,30.7% (n=92), were under the age group of 25-34yrs and 35-44yrs respectively. The mean age was 29.8. Around 55.7% (n=167) of the study participants were male and the remaining 44.3% (n=133) were females. Regarding the educational qualification, 29% (n=87) had a high school education, 24%(n=72) with graduate degree and around 9.7%(n=29) were illiterates. 83.7%(n=251) belonged to Nuclear family and 9.3%(n=28) to three generation family. Among the Study participants, 71% (n=213) were married, 26.7%(n=80) were unmarried and 2%(n=6) were widower.

TABLE 2: Distribution Of Work Profile Of The Study Participants

WORK PROFILE		FREQUENCY(N=300)	PERCENTAGE
PLACE OF OCCUPATION	PRODUCTION	212	70.7%
	TECHNICAL	70	23.3%
	MANAGEMENT	18	6%
NATURE OF WORK	MECHANICAL	103	34.3%
	MANUAL	197	65.7%
TYPE OF WORK	SKILLED	84	28%
	SEMI-SKILLED	120	40%
	UNSKILLED	96	32%
WORK SHIFT	DAY	64	21.3%
	NIGHT	3	1%
	GENERAL	233	77.7%
WORK EXPERIENCE	<5 YRS	139	46.3%
	5 - 10 YRS	103	34.3%
	>10 YRS	58	19.3%

As shown in Table 2, 70.7%(n=212) were in the Production department and the remaining 23.3% (n=70) and 6% (n=18) were in the Technical and Management departments. 34.3% (n=103) of

the Participants did mechanical work and the 65.7%(n=197) did manual type of work. Around 40% (n=120) were semi-skilled and 32% (n=96) were unskilled and 28% (n=84) were skilled. Nearly 77.7% (n=233) of the participants belonged to the General shift. 46.3%(n=139) had the work experience for less than 5 yrs, 34.3%(n=103) had an experience for 5-10 yrs and 19.3% (n=58) for more than 10 yrs.

FIG 1: Distribution Of Pre-Employment Medical Screening Among The Study Participants.
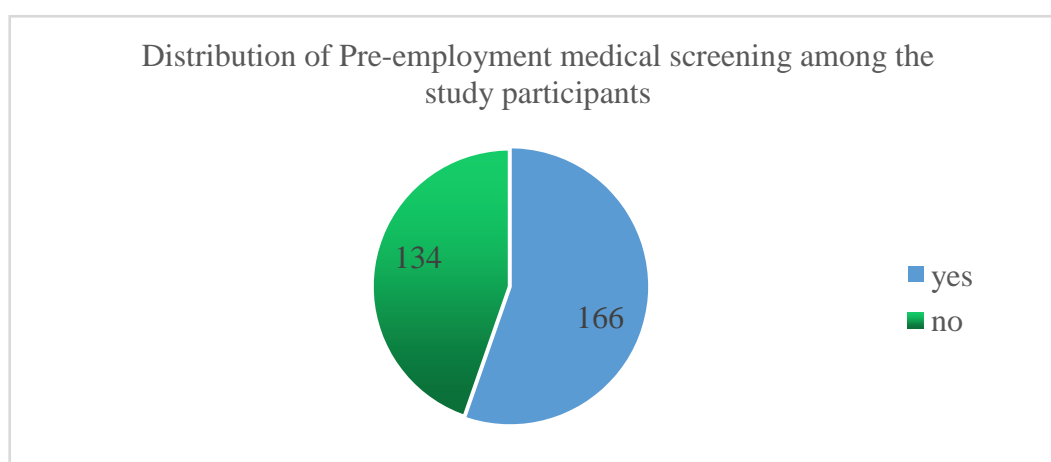
From the Pie diagram, it is observed that 55.3%(n=166) had Pre- employment medical screening and the remaining 44.7%(n=134) had not undergone any medical screening

FIGURE 2: Distribution Of Periodic Medical Check Up Among The Study Participants
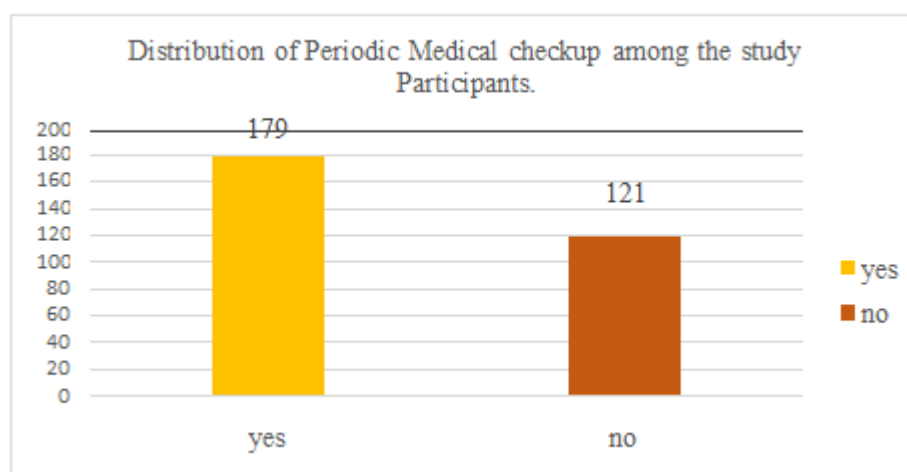
Among the study participants the above bar diagram shows that nearly 59.7% (n=179) had undergone periodic medical checkup and 40.3% (n=121) did not have any periodic checkup.

TABLE 3: Distribution Of Nicotine Dependence Among The Study Participants

NICOTINE DEPENDENCE		MEN (N=167)		WOMEN (N=133)	
		Frequency	Percentage	Frequency	Percentage
Yes	Low	0	0	0	0
	Low - Moderate	2	1.197%	1	0.75%
	Moderate	69	41.31%	4	3%
	High	10	5.98%	0	0
No		86	51.49%	128	96.24%

The table is showing the distribution of Nicotine dependence which was assessed using the Fagerstrom scale40. 41.31% (n=69) had moderate dependence for Nicotine among the Males and 3% (n=4) in females. 5.98% (n=10) of male Participants reported HIgh Nicotine Dependence.

TABLE 4: Distribution Of Alcohol Dependence Among The Study Participants

ALCOHOL DEPENDENCE		MEN (N=167)		WOMEN (N=133)	
		Frequency	Percentage	Frequency	Percentage
Yes	Not a Hazardous drinker	67	40.11%	0	0
	Hazardous Drinker	24	14.37%	3	2.25%
No		76	45.50%	130	97.7%

The table 4 shows the Distribution of Alcohol Dependence and 14.37% (n=24) among the males reported being a hazardous drinker which was assessed using the AUDIT-C questionnaire41.

TABLE 5: Distribution Of Workplace Hazards Among The Study Participants

WORKPLACE	MEN (N=167)		WOMEN (N=133)	
	Frequency	Percentage	Frequency	Percentage
Exposed	124	74.25%	102	76.69%

| Not Exposed	43	25.74%	31	23.30%

The above table is showing the Distribution of Workplace hazards among the study participants. Nearly 74.25% (n=124) in Males and 76.69% (n=102) were exposed to the risk of Occupational hazards and the remaining 25.74% (n=43) in Males and 23.30% (n=31) in Females were not exposed.

FIG 3: Distribution Of Ocular Complaints Among The Study Population
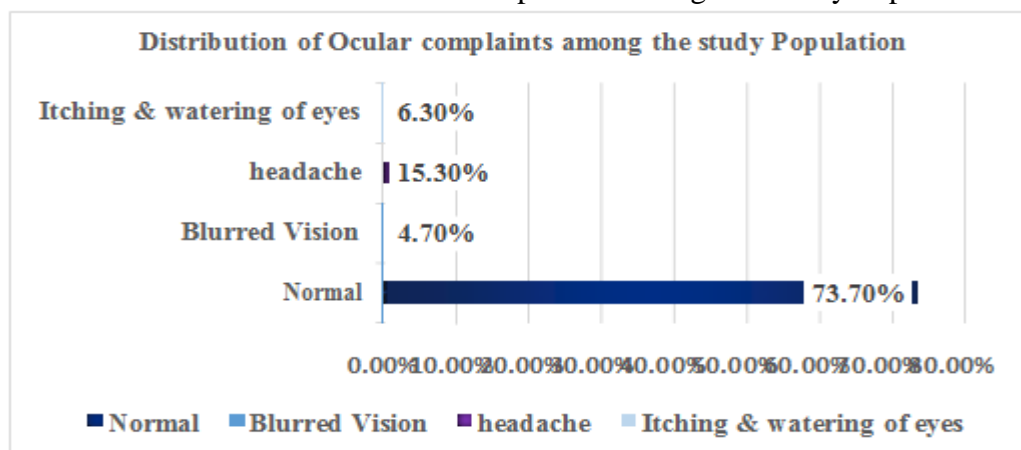
The distribution of Ocular complaints among the Participants is shown in the bar diagram.15.3%(n=46), 6.3% (n=19) and 4.7%(n=14) had reported with the complaints of headache, itching & watering of eyes and blurred vision respectively.

FIG 4: Distribution Of Oral Cavity Complaints Among The Study Population
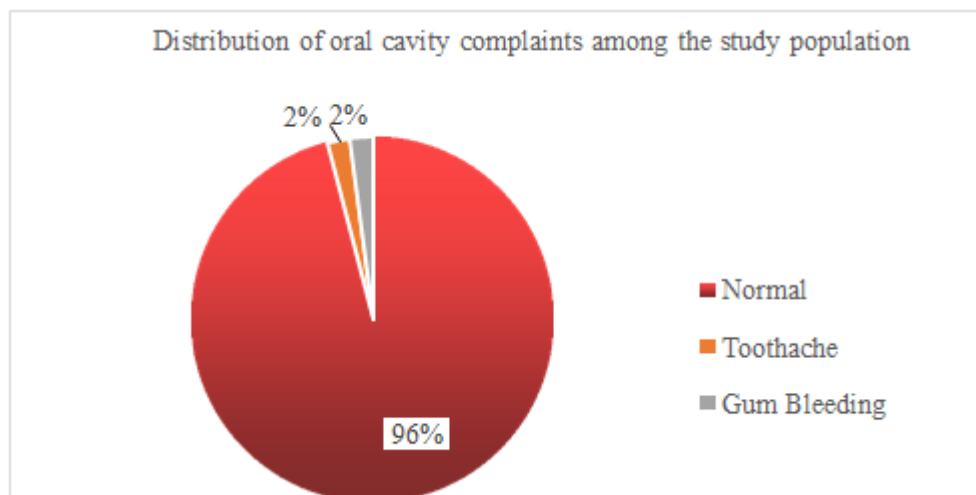
The Pie diagram is showing the distribution of the Oral complaints and only 2% (n=6) of the participants had reported with toothache and gum bleeding each.

FIG 5: Distribution Of Ent Complaints Among The Study Population

Distribution of ENT complaints among the study Population
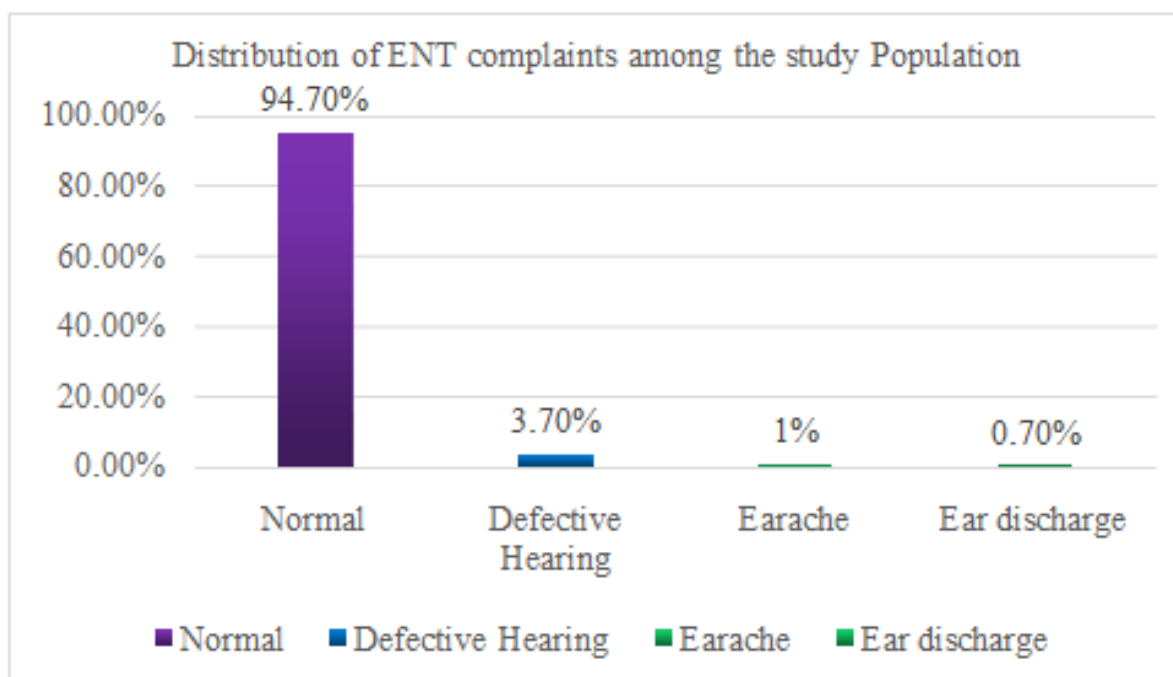
Among the participants, the distribution of ENT complaints had reported with complaints of 3.7% (n=11) with defective hearing and 1% (n=3) with ear ache.

FIG 6: Distribution Of Cardiovascular Complaints Among The Study Population

Distribution of Cardiovascular complaints among the study Population
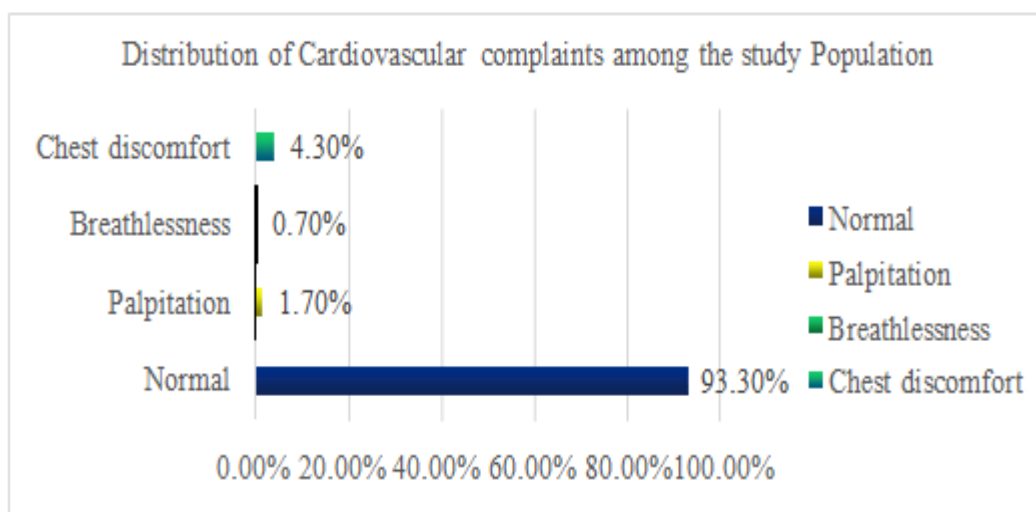
Figure 6 shows the distribution of Cardiovascular complaints among the study participants and it is found to be, that 4.3% (n=13) had the complaints of chest discomfort, 0.7% (n=2) had reported of Breathlessness.

FIG 7: Distribution Of Respiratory Complaints Among The Study Population

Distribution of Respiratory complaints among the study population
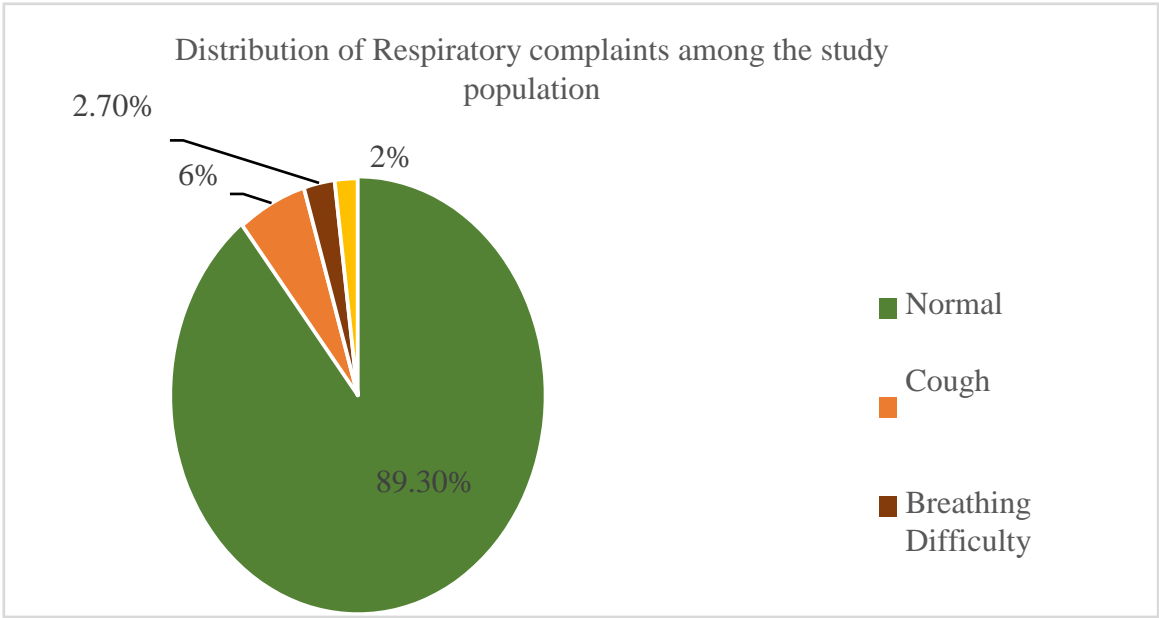
From the pie diagram 6% (n=18), 2.7% (n=8), 2% (n=6) of the study participants had the complaint of cough, breathing difficulty and wheezing respectively.

FIG 8: Distribution Of Gastrointestinal Tract Complaints Among The Study Population

Distribution of the Gastrointestinal complaints among the study Population
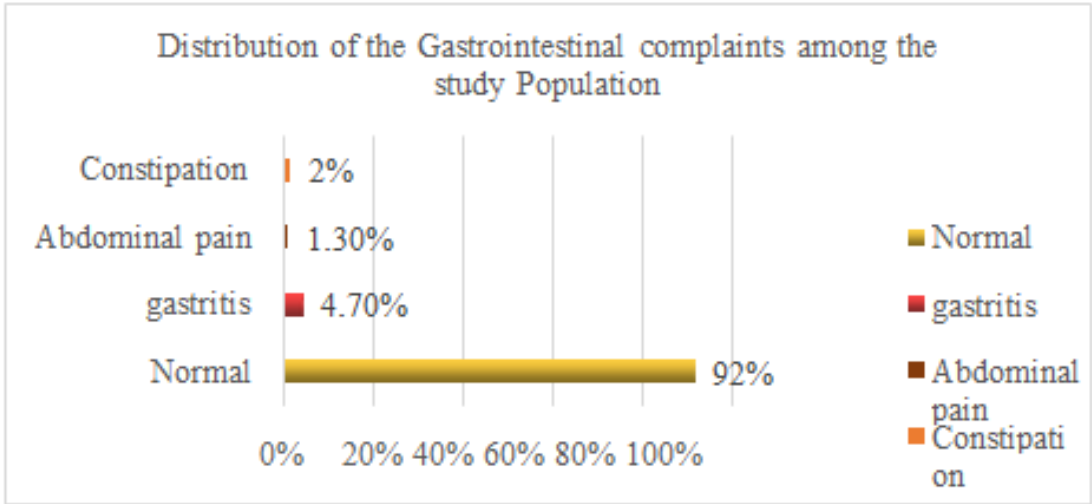
From the above bar diagram it is evident that 4.7% (n=14) reported with the complaints of gastritis, 2% reported with constipation and 1.3% (n=4) with the complaints of abdominal pain.

FIG 9: Distribution Of Urinary Complaints Among The Study Population

Distribution of Urinary complaints among theStudy Population

- Normal
- Burning Micturition
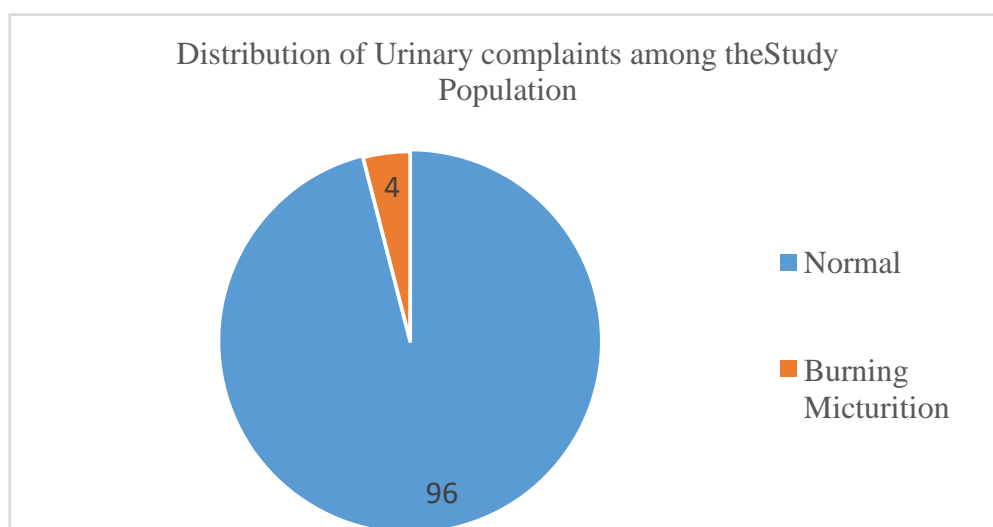
Among the participants the Pie diagram is showing the distribution of urinary complaints where 4% (n=12) had reported with burning micturition.

FIG 10: Distribution Of Nervous Complaints Among The Study Population

Distribution of Nervous complaints among the study Population

Normal	95.30%
Giddiness	2.30%
Burning sensation in limbs	1%
Numbness	1.30%
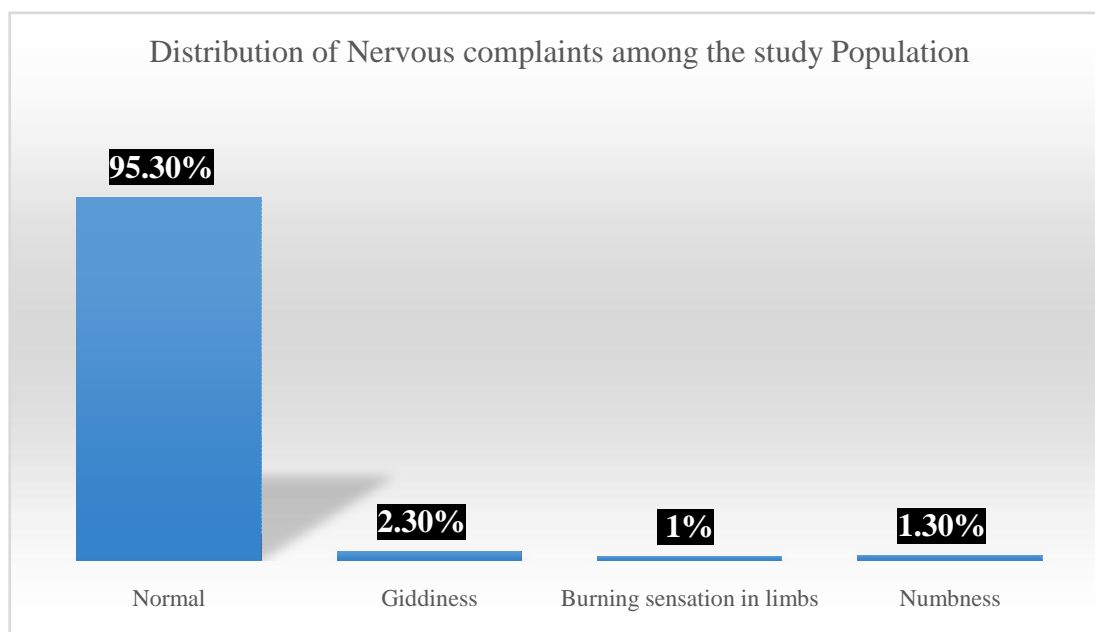
The bar diagram is showing the distribution of nervous complaints among the study population where 2.3% (n=7) had reported with giddiness.

TABLE 6: Distribution Of Musculoskeletal Complaints Among The Study Population

COMPLAINTS	FREQUENCY (N = 300)	PERCENTAGE

NORMAL	185	61.7%
LOW BACK ACHE	64	21.3%
JOINT PAIN	29	9.7%
NECK PAIN	22	7.3%

The distribution of musculoskeletal complaints among the study population reported, 21.3% (n=64), 9.7% (n=29), 7.3% (n=22) with low back pain, joint pain and Neck pain respectively.

TABLE 7: Distribution Of Dermatology Complaints Among The Study Population

COMPLAINTS	FREQUENCY (N = 300)	PERCENTAGE
NORMAL	266	88.7%
ITCHING	21	7%
PIGMENTED PATCHES	10	3.3%
ULCERS	3	1%

Table 7 is showing the distribution of dermatologic complaints .7% (n=21) had the complaints of itching, 3.3% (n=10) had pigmented patches and 1% (n=3) with ulcers.

TABLE 8: Distribution Of Work Stress Scale Among The Study Population

CATEGORY	FREQUENCY (N = 300)	PERCENTAGE
CHILLED OUT/ CALM	126	42%
FAIRLY LOW	119	39.7%
MODERATE STRESS	34	11.35%
SEVERE STRESS	16	5.3%
POTENTIALY HIGH STRESS	5	1.7%

In the distribution of work stress among the study population 39.7% (n=119) reported with fairly low stress, 11.35% (n=34) with moderate stress and 5.3% (n=16) with severe stress among the study participants.

TABLE 9: Distribution Of Job Satisfaction Scale Among The Study Population

SATISFACTION LEVEL	FREQUENCY (N = 300)	PERCENTAGE
VERY HIGH	267	89%
HIGH	28	9.3%
AVERAGE	5	1.7%
LOW	-	-
VERY LOW	-	-

As shown in the table among the study participants, 89% (n=267) reported with very high satisfaction regarding their occupation, 9.3% (n= 28) reported with high and 1.7%(n=5) with average satisfaction.

TABLE 10: Association Between Sociodemographic Profile And Workplace Hazards

S NO	VARIABLES		OCCUPATIONAL HAZARDS		X^2	P VALUE
			EXPOSED	NOT EXPOSED		
1.	AGE CATEGORY	15 - 24 Yrs	36(12%)	10(3.33%)	9.401	0.052
		25 - 34 Yrs	85(28.33%)	37(12.33%)		
		35 - 44 Yrs	72(24%)	20(6.66%)		
		45 - 54 Yrs	31(10.3%)	4(1.33%)		
		>= 55 Yrs	2(0.66%)	3(1%)		
2.	GENDER	MALE	124(41.3%)	43(14.33%)	0.237	0.626
		FEMALE	102(34%)	31(10.33%)		
3.	RELIGION	HINDU	214(71.3%)	69(23%)	2.410	0.661
		CHRISTIAN	8(2.66%)	3(1%)		
		MUSLIM	4(1.33%)	2(0.66%)		
4.	EDUCATION	ILLITERATE	25(8.33%)	4(1.33%)		

					CHI SQUARE	P VALUE
		PRIMARY	12(4%)	2(0.66%)		
		MIDDLE	35(11.66%)	10(3.33%)		
		HIGH	70(23.33%)	17(5.66%)	15.66	0.008*
		HIGHER SECONDARY	42(14%)	11(3.66%)		
		GRADUATE	42(14%)	30(10%)		
5.	SOCIO ECONOMIC STATUS	CLASS I	21(7%)	7(2.33%)		
		CLASS II	82(27.33%)	25(8.33%)		
		CLASS III	91(30.33%)	32(10.66%)	1.868	0.760
		CLASS IV	30(10%)	8(2.66%)		
		CLASS V	2(0.66%)	2(0.66%)		
6.	TYPE OF FAMILY	NUCLEAR	188(62.6%)	63(21%)		
		JOINT	19(6.3%)	2(0.66%)		
		THREE GENERATION	19(6.3%)	9(3%)	3.459	0.177
7.	MARITAL STATUS	MARRIED	159(53%)	54(18%)		
		UNMARRIED	63(21%)	17(5.66%)		
		DIVORCED	1(0.33%)	0	2.956	0.398
		WIDOWER	3(1%)	3(1%)		

The Table 10 shows the association of the sociodemographic profile with occupational hazards. Regarding the Educational qualification, 23.33%(n=70) were exposed to occupational hazards who had high school education, 11.66% exposed to hazards had completed middle school education. The table shows the association of education with the occupational hazards (p= 0.008, X2 = 15.667) and is statistically significant. There has been no association of occupational hazards with the other sociodemographic variables.

TABLE 11: Association Between The Work Profile And Alcohol Dependence

WORK PROFILE	ALCOHOL DEPENDENCE		CHI SQUARE	P VALUE
	YES	NO		

PLACE OF OCCUPATION	PRODUCTION	18(6%)	194(64.6%)	28.288	0.029*
	TECHNICAL	5(1.66%)	65(21.66%)		
	MANAGEMENT	2(0.66%)	16(5.33%)		
NATURE OF WORK	MECHANICAL	3(1%)	100(33.3%)	19.933	0.011*
	MANUAL	22(7.3%)	175(58.3%)		
TYPE OF WORK	SKILLED	5(1.66%)	79(26.33%)	16.641	0.409
	SEMI-SKILLED	13(4.3%)	107(35.6%)		
	UNSKILLED	7(2.33%)	89(29.66)		
WORK SHIFT	DAY	6(2%)	58(19.33%)	28.31	0.029*
	NIGHT	1(0.33%)	2(0.66%)		
	GENERAL	18(6%)	215(71.6%)		
WORK EXPERIENCE	<5 YRS	13(4.3%)	126(42%)	50.144	0.000*
	5 - 10 YRS	6(2%)	97(32.33%)		
	>10 YRS	6(2%)	52(17.33%)		
* P< 0.05, Statistically significant at 95% CI (confidence interval)					

The Table 11, is showing the association of work profile and its dependence on alcohol. The place of occupation has shown a association with p value of 0.029
(X2 = 28.288) and is statistically significant. Similarly, the nature of work, work shift and working experience has also been statistically significant with a p value < 0.05

TABLE 12: Association Between The Work Profile And Nicotine Dependence

WORK PROFILE		NICOTINE DEPENDENCE				CHI SQUARE	P VALUE
		LOW	LOW-MOD	MOD	HIGH		
PLACE OF	PRODUCTION	154 (51.3%)	2 (0.6%)	49 (16.3%)	7 (2.33%)	25.99	0.026*

OCCUPATION	TECHNICAL	42 (14%)	0	26 (8.66%)	2 (0.66%)		
	MANAGEMENT	12 (4%)	2 (0.6%)	4 (1.33%)	0		
NATURE OF WORK	MECHANICAL	64 (21.3%)	1 (0.3%)	34 (11.3%)	4 (1.33%)	13.06	0.071
	MANUAL	150 (50%)	2 (0.6%)	39 (13%)	6 (2%)		
TYPE OF WORK	SKILLED	46 (15.3%)	1 (0.3%)	35 (11.6%)	2 (0.66%)	27.47	0.017*
	SEMI SKILLED	87 (29%)	2 (0.6%)	25 (8.33%)	6 (2%)		
	UNSKILLED	81 (27%)	0	13 (4.33%)	2 (0.66%)		
WORK SHIFT	DAY	57 (19%)	0	5 (1.66%)	2 (0.66%)	30.49	0.007*
	NIGHT	2 (0.66%)	0	1 (0.33%)	0		
	GENERAL	155 (51.6%)	3 (1%)	67 (22.3%)	8 (2.66%)		
WORK EXPERIENCE	<5 YRS	96 (32%)	2 (0.6%)	35 (11.6%)	6 (2%)	7.986	0.890
	5 - 10 YRS	76 (25.33%)	0	25 (8.33%)	2 (0.66%)		
	>10 YRS	42 (14%)	1 (0.3%)	13 (4.33%)	2 (0.66%)		

* P< 0.05, Statistically significant at 95% CI (confidence interval)

From the study population it is observed that there has been a association of work profile and their dependence on nicotine with a p value < 0.05 and is found statistically significant.

TABLE 13: Association Between The Work Profile And The Work Stress.

WORK PROFILE		WORK STRESS SCALE					CHI SQUARE	P VALU E
		CALM	LOW	MOD	SEVER E	HIGH		
PLACE OF OCCUPATION	PRODUCTION	97 (32.3%)	80 (6.66%)	24 (8%)	4 (1.3%)	7 (2.3%)	14.94	0.060
	TECHNICAL	24 (8%)	29 (9.66%)	7 (2.3%)	1 (0.3%)	9 (3%)		
		5	10	3	0	0		

							CHI SQUARE	P VALUE
	MANAGEMENT	(1.66%)	(3.33%)	(1%)				
NATURE OF WORK	MECHANICAL	52 (17.3%)	36 (12%)	10 (3.3%)	0	5 (1.6%)	6.615	0.158
	MANUAL	74 (24.6%)	83 (27.6%)	24 (8%)	5 (1.6%)	11 (3.6%)		
TYPE OF WORK	SKILLED	43 (14.3%)	24 (8%)	12 (4%)	0	5 (1.6%)	25.32	0.001*
	SEMI SKILLED	57 (19%)	44 (14.6%)	7 (2.3%)	3 (1%)	9 (3%)		
	UNSKILLED	26 (8.66%)	51 (17%)	15 (5%)	2 (0.6%)	2 (0.6%)		
WORK SHIFT	DAY	19 (6.33%)	31 (10.3%)	9 (3%)	0	5 (1.6%)	17.14	0.029*
	NIGHT	1 (0.33%)	0	2 (0.6%)	0	0		
	GENERAL	106 (35.3%)	86 (28.6%)	25 (8.3%)	5 (1.6%)	11 (3.6%)		
WORK EXPERIENCE	<5 YRS	54 (18%)	60 (20%)	15 (5%)	3 (1%)	7 (2.3%)	3.997	0.857
	5 - 10 YRS	44 (14.6%)	37 (12.3%)	13 (4.3%)	2 (0.6%)	7 (2.3%)		
	>10 YRS	28 (9.33%)	22 (7.33%)	6 (2%)	0	2 (0.6%)		

* P< 0.05, Statistically significant at 95% CI (confidence interval)

It is found that the type of work has influenced stress among the study participants with a p value 0.001 (X2 = 25.329). The work shift has also shown statistically significant results and thus has proved its association with stress related to the job.

TABLE 14: Association Between The Work Profile And The Job Satisfaction Scale

WORK PROFILE		JOB SATISFACTION SCALE			CHI SQUARE	P VALUE
		VERY HIGH	HIGH	AVERAGE		
PLACE OF	PRODUCTION	196 (65.33%)	15 (5%)	1 (0.33%)		

					CHI SQUARE	P VALUE
OCCUPATION	TECHNICAL	56 (18.66%)	11 (3.66%)	3 (1%)	11.589	0.021*
	MANAGEMENT	15 (5%)	2 (0.66%)	1 (0.33%)		
NATURE OF WORK	MECHANICAL	90 (30%)	11 (3.66%)	2 (0.66%)	0.422	0.810
	MANUAL	177 (59%)	17 (5.66%)	3 (1%)		
TYPE OF WORK	SKILLED	74 (27%)	8 (2.66%)	2 (0.66%)	2.635	0.621
	SEMI-SKILLED	105 (35%)	12 (4%)	3 (1%)		
	UNSKILLED	88 (29.33%)	8 (2.66%)	0		
WORK SHIFT	DAY	56 (18.66%)	6 (2%)	2 (0.66%)	20.260	0.000*
	NIGHT	2 (0.66%)	0	1 (0.33%)		
	GENERAL	209 (69.66%)	22 (7.33%)	2 (0.66%)		
WORK EXPERIENCE	<5 YRS	122 (40.66%)	15 (5%)	2 (0.66%)	7.208	0.125
	5 - 10 YRS	88 (29.33%)	12 (4%)	3 (1%)		
	>10 YRS	58 (19.33%)	0	0		
* P< 0.05, Statistically significant at 95% CI (confidence interval)						

From the above table it is observed that the work profile of the study participants has a strong association with their job satisfaction with a p value < 0.05 and hence being statistically significant.

TABLE 15: Association Between Alcohol Dependence And Work Stress Among The Study Participants**.**

ALCOHOL DEPENDENCE	WORK STRESS SCALE					CHI SQUAR E	P VALUE
	CALM	LOW	MOD	SEVER E	HIGH		
YES	6 (2%)	108 (36%)	30 (10%)	2 (0.66%)	15 (5%)	57.285	0.004*
NO	120 (40%)	11 (3.66%)	4 (1.3%)	3 (1%)	1 (0.33%)		

* P< 0.05, Statistically significant at 95% CI (confidence interval)

The table 15 is showing that behavior of alcohol dependence among the study participants has been strongly associated with stress in their workplace with a p value of 0.004 (X2 = 57.285).

TABLE 16: Association Between The Alcohol Dependence And Job Satisfaction Scale**.**

ALCOHOL DEPENDENCE	JOB SATISFACTION SCALE			CHI SQUARE	P VALUE
	VERY HIGH	HIGH	AVERAGE		
YES	21 (7%)	3 (1%)	1 (0.33%)	14.191	0.585
NO	246 (82%)	25 (8.33%)	4 (1.33%)		
* P< 0.05, Statistically significant at 95% CI (confidence interval)					

From the above mentioned table alcohol dependence is found to have no association with their job satisfaction.

TABLE 17: Association Between The Nicotine Dependence And Work Stress

NICOTINE DEPENDENCE	WORK STRESS SCALE					CHI SQUARE	P VALUE
	CALM	LOW	MOD	SEVER E	HIGH		
LOW	87 (29%)	86 (28.6%)	23 (7.6%)	5 (1.66%)	13 (4.33%)	21.711	0.794
LOW - MOD	2 (0.6%)	1 (0.33%)	0	0	0		
MOD	32 (10.6%)	31 (10.3%)	8 (2.6%)	0	2 (0.66%)		
HIGH	5 (1.66)	1 (0.33%)	3 (1%)	0	1 (0.33%)		
* P< 0.05, Statistically significant at 95% CI (confidence interval)							

Table 17 shows that there exists no association between nicotine dependence and the work stress among the participants.

TABLE 18: Association Between The Nicotine Dependence And Job Satisfaction Scale**.**

NICOTINE DEPENDENCE	JOB SATISFACTION SCALE			CHI SQUARE	P VALUE
	VERY HIGH	HIGH	AVERAGE		
LOW	191 (63.66%)	21 (7%)	2 (0.66%)	9.035	0.829
LOW - MOD	3 (1%)	0	0		
MOD	64 (21.33%)	6 (2%)	3 (1%)		
HIGH	9 (3%)	1 (0.33%)	0		
* P< 0.05, Statistically significant at 95% CI (confidence interval)					

There is no association between nicotine dependence with the job satisfaction among the study participants in their work place.

TABLE 19: Association Between Occupational Hazards And Dependence On Alcohol**.**

ALCOHOL DEPENDENCE	OCCUPATIONAL HAZARDS		CHI SQUARE	P VALUE
	EXPOSED	NOT EXPOSED		
YES	23(7.66%)	72(24%)	5.368	0.718
NO	203(67.66%)	2(0.66%)		
* P< 0.05, Statistically significant at 95% CI (confidence interval)				

From the above table it is found that there has been no association between occupational hazards with alcohol dependence behavior of the participants.

TABLE 20: Association Between Occupational Hazards And Dependence On Nicotine.

NICOTINE DEPENDENCE	OCCUPATIONAL HAZARDS		CHI SQUARE	P VALUE
	EXPOSED	NOT EXPOSED		
LOW	161(53.66%)	53(17.66%)	10.796	0.148
LOW-MODERATE	1(0.33%)	2(0.66%)		
MODERATE	58(19.33%)	15(5%)		
HIGH	6(2%)	4(1.33%)		
* P< 0.05, Statistically significant at 95% CI (confidence interval)				

The table is showing the association between the occupational hazards and the dependence of study participants in alcohol intake and has been found to be not statistically significant and hence not associated.

TABLE 21: Asssociation Between Work Profile And Ocular Complaints Among The Study Participants.

WORK PROFILE		OCULAR COMPLAINTS		CHI SQUAR E	P VALUE
		YES	NO		
PLACE OF OCCUPATION	PRODUCTION	57(19%)	155(51.66%)	7.013	0.320
	TECHNICAL	15(5%)	55(18.33%)		
	MANAGEMEN T	7(2.33%)	11(3.66%)		
NATURE OF WORK	MECHANICAL	19(6.33%)	84(28%)	5.116	0.164
	MANUAL	60(20%)	137(45.66%)		
TYPE OF WORK	SKILLED	17(5.66%)	67(22.33%)	6.203	0.401
	SEMI-SKILLE D	6(2%)	84(28%)		
	UNSKILLED	36(12%)	70(23.33%)		
WORK SHIFT	DAY	17(5.66%)	47(15.66%)	25.045	0.000*
	NIGHT	2(0.66%)	1(0.33%)		
	GENERAL	60(20%)	173(57.66%)		
WORK EXPERIENCE	<5 YRS	33(11%)	106(35.33%)	6.907	0.329
	5 - 10 YRS	27(9%)	76(25.33%)		
	>10 YRS	19(6.33%)	39(13%)		
TECHNICAL QUALIFICATION	YES	14(4.66%)	61(20.33%)	5.601	0.133
	NO	65(21.66%)	160(53.33%)		
* P< 0.05, Statistically significant at 95% CI (confidence interval)					

Among the study participants it is observed that the work shift has strong association with their ocular complaints with p value of 0.000 (X2 = 25.045). No statistical significance is found with other domains of work profile of the study participants.

TABLE 22: Asssociation Between Work Profile And Ent Complaints Among The Study Population.

WORK PROFILE		ENT COMPLAINTS		CHI SQUAR E	P VALUE
		YES	NO		
PLACE OF OCCUPATION	PRODUCTION	9(3%)	203(67.66%)	8.762	0.187
	TECHNICAL	6(2%)	64(21.33%)		
	MANAGEMENT	1(0.33%)	17(5.66%)		
NATURE OF WORK	MECHANICAL	4(1.33%)	99(33%)	0.362	0.948
	MANUAL	12(4%)	185(61.66%)		
TYPE OF WORZ	SKILLED	8(2.66%)	76(25.33%)	13.551	0.035*
	SEMI-SKILLED	4(1.33%)	116(38.66%)		
	UNSKILLED	4(1.33%)	92(30.66%)		
WORK SHIFT	DAY	3(1%)	61(20.33%)	9.517	0.147
	NIGHT	1(0.33%)	2(0.66%)		
	GENERAL	12(4%)	221(73.66%)		
WORK EXPERIENCE	<5 YRS	9(3%)	130(43.33%)	6.221	0.339
	5 - 10 YRS	6(2%)	97(32.33%)		
	>10 YRS	1(0.66%)	57(19%)		
TECHNICAL QUALIFICATION	YES	8(2.66%)	67(22.33%)	10.725	0.013*
	NO	8(2.66%)	217(72.33%)		
* P< 0.05, Statistically significant at 95% CI (confidence interval)					

The type of work and the technical qualification of the workers has shown an association with their ENT complaints with p value <0.05 and hence been statistically significant.

TABLE 23: Asssociation Between Work Profile And Cardiovascular Complaints Among The Study Population

WORK PROFILE	CARDIOVASCULAR COMPLAINTS	CHI	P

		YES	NO	SQUARE	VALUE
PLACE OF OCCUPATION	PRODUCTION	11(3.66%)	201(67%)		
	TECHNICAL	7(2.33%)	63(21%)	5.696	0.458
	MANAGEMENT	2(0.66%)	16(5.33%)		
NATURE OF WORK	MECHANICA L	7(2.33%)	96(32%)	0.362	0.948
	MANUAL	13(4.33%)	184(61.33%)		
TYPE OF WORK	SKILLED	9(3%)	75(25%)		
	SEMI-SKILLE D	7(2.33%)	113(37.66%)	11.864	0.065
	UNSKILLED	4(1.33%)	92(30.66%)		
WORK SHIFT	DAY	4(1.33%)	60(20%)		
	NIGHT	0	3(1%)	2.086	0.912
	GENERAL	16(5.33%)	217(72.33%)		
WORK EXPERIENCE	<5 YRS	5(1.66%)	134(41.33%)		
	5 - 10 YRS	9(3%)	94(31.33%)	8.994	0.174
	>10 YRS	6(2%)	52(17.33%)		
TECHNICAL QUALIFICATI ON	YES	8(2.66%)	67(22.33%)	10.941	0.012*
	NO	12(4%)	213(71%)		
* P< 0.05, Statistically significant at 95% CI (confidence interval)					

The association of cardiovascular complaints of the study participants with their work profile has shown that technical qualification of the workers has an association with p value 0.012 (X2 = 10.941) and hence proven to be statistically significant.

TABLE 24: Asssociation Between Work Profile And Respiratory Complaints Among The Study Population

WORK PROFILE	RESPIRATORY COMPLAINTS		CHI SQUARE	P VALUE
	YES	NO		

PLACE OF OCCUPATION	PRODUCTION	18(6%)	194(64.6%)	12.754	0.047*
	TECHNICAL	13(4.33%)	57(19%)		
	MANAGEMENT	1(0.66%)	17(5.66%)		
NATURE OF WORK	MECHANICAL	12(4%)	91(30.3%)	1.884	0.597
	MANUAL	20(6.66%)	177(59%)		
TYPE OF WORK	SKILLED	13(4.33%)	71(23.66%)	8.238	0.221
	SEMI-SKILLED	10(3.33%)	110(36.6%)		
	UNSKILLED	9(3%)	87(29%)		
WORK SHIFT	DAY	0	62(20.66%)	18.431	0.005*
	NIGHT	1(0.66%)	2(0.66%)		
	GENERAL	29(9.66%)	204(68%)		
WORK EXPERIENCE	<5 YRS	20(6.66%)	119(39.6%)	6.310	0.389
	5 - 10 YRS	10(3.33%)	93(31%)		
	>10 YRS	2(0.66%)	56(18.66%)		
TECHNICAL QUALIFICATION	YES	14(4.66%)	61(20.33%)	7.235	0.065
	NO	18(6%)	207(69%)		

* P< 0.05, Statistically significant at 95% CI (confidence interval)

The table is showing no association between the place of occupation and their work shift with p value >0.05 and hence not found to be statistically significant.

TABLE 25: Asssociation Between Work Profile And Gastrointestinal Complaints Among The Study Population

WORK PROFILE		GASTROINTESTINAL COMPLAINTS		CHI SQUARE	P VALUE
		YES	NO		
	PRODUCTION	11(3.6%)	201(67%)		

PLACE OF OCCUPATION	TECHNICAL	12(4%)	58(19.33%)	14.511	0.024*
	MANAGEMENT	1(0.66%)	17(5.66%)		
NATURE OF WORK	MECHANICAL	8(2.66%)	95(31.66%0	4.447	0.217
	MANUAL	16(5.3%)	181(60.33%)		
TYPE OF WORK	SKILLED	10(3.3%)	74(24.66%)	8.202	0.224
	SEMI-SKILLED	12(4%)	108(36%)		
	UNSKILLED	2(0.66)	94(31.33%)		
WORK SHIFT	DAY	1(0.33%)	63(21%)	5.151	0.525
	NIGHT	0	3(1%)		
	GENERAL	23(7.6%)	210(70%)		
WORK EXPERIENCE	<5 YRS	18(6%)	121(40.33%)	11.448	0.075
	5 - 10 YRS	5(1.66%)	98(32.66%)		
	>10 YRS	1(0.33%)	57(19%)		
TECHNICAL QUALIFICATION	YES	9(3%)	66(22%)	3.602	0.308
	NO	15(5%)	210(70%)		

* P< 0.05, Statistically significant at 95% CI (confidence interval)

It is observed from the table that there has been an association between the place of occupation and the gastrointestinal complaints with p value 0.024 (X2 = 14.511).

TABLE 26: Asssociation Between Work Profile And Nervous Complaints Among The Study Population

WORK PROFILE		NERVOUS COMPLAINTS		CHI SQUARE	P VALUE
		YES	NO		
PLACE OF OCCUPATION	PRODUCTION	7(2.33%)	205(68.3%)	8.056	0.234
	TECHNICAL	6(2%)	64(21.3%)		

		YES	NO		
	MANAGEMENT	1(0.66%)	17(5.66%)		
NATURE OF WORK	MECHANICAL	4(1.33%)	99(33%)	5.761	0.124
	MANUAL	10(3.33%)	187(62.3%)		
TYPE OF WORK	SKILLED	10(3.33%)	74(24.66%)	18.733	0.005*
	SEMI-SKILLED	1(0.33%)	119(39.6%)		
	UNSKILLED	3(1%)	93(31%)		
WORK SHIFT	DAY	1(0.33%)	63(21%)	26.664	0.000*
	NIGHT	1(0.33%)	2(0.66%)		
	GENERAL	12(4%)	221(73.6%)		
WORK EXPERIENCE	<5 YRS	7(2.33%)	132(44%)	11.068	0.086
	5 - 10 YRS	6(2%)	97(32.33%)		
	>10 YRS	1(0.33%)	57(19%)		
TECHNICAL QUALIFICATION	YES	8(2.66%)	67(22.33%)	26.664	0.000*
	NO	6(2%)	219(73%)		
* P< 0.05, Statistically significant at 95% CI (confidence interval)					

The table is showing strong association between the work profile and nervous complaints with p value < 0.05 and thus found to be statistically significant.

TABLE 27: Asssociation Between Work Profile And Musculoskeletal Complaints Among The Study Population

WORK PROFILE		MUSCULOSKELETAL COMPLAINTS		CHI SQUARE	P VALUE
		YES	NO		
PLACE OF OCCUPATION	PRODUCTION	79(26.3%)	133(44.3%)	8.330	0.215
	TECHNICAL	26(8.66%)	44(14.66%)		

	MANAGEMENT	10(3.33%)	8(2.66%)		
NATURE OF WORK	MECHANICAL	27(9%)	76(25.33%)	9.966	0.019*
	MANUAL	88(29.3%)	109(36.3%)		
TYPE OF WORK	SKILLED	26(8.66%)	58(19.33%)	9.920	0.218
	SEMI-SKILLED	42(14%)	78(26%)		
	UNSKILLED	47(15.6%)	49(16.33%)		
WORK SHIFT	DAY	29(9.66%)	35(11.66%)	49.642	0.000*
	NIGHT	3(1%)	0		
	GENERAL	83(27.6%)	150(50%)		
WORK EXPERIENCE	<5 YRS	51(17%)	88(29.33%)	19.914	0.003
	5 - 10 YRS	52(17.3%)	51(17%)		
	>10 YRS	12(4%)	46(15.33%)		
TECHNICAL QUALIFICATION	YES	21(7%)	54(18%)	4.807	0.187
	NO	94(31.3%)	131(43.6%)		

* P< 0.05, Statistically significant at 95% CI (confidence interval)

The study participants have shown strong association between type of work and the musculoskeletal disorders with p value 0.019 (X2 = 9.966). Work shift has also been association with musculoskeletal disorders with p value 0.000.

TABLE 28: Asssociation Between Work Profile And Dermatology Complaints Among The Study Population

WORK PROFILE		DERMATOLOGY COMPLAINTS		CHI SQUARE	P VALUE
		YES	NO		
PLACE OF OCCUPATION	PRODUCTION	24(8%)	188(62.6%)	3.949	0.684
	TECHNICAL	10(3.33%)	60(20%)		
	MANAGEMENT	0	18(6%)		
NATURE OF WORK	MECHANICAL	11(3.66%)	92(30.66%)	2.129	0.546
	MANUAL	23(7.66%)	174(58%)		
TYPE OF WORK	SKILLED	9(3%)	75(25.66%)	4.829	0.566
	SEMI-SKILLED	15(5%)	105(35%)		

	UNSKILLED	10(3.33%)	86(28.66%)		
WORK SHIFT	DAY	8(2.66%)	56(18.66%)	33.037	0.000*
	NIGHT	1(0.66%)	2(0.66%)		
	GENERAL	25(8.33%)	208(69.3%)		
WORK EXPERIENCE	<5 YRS	17(5.66%)	122(40.6%)	1.953	0.924
	5 - 10 YRS	13(4.33%)	90(30%)		
	>10 YRS	4(1.33%)	54(18%)		
TECHNICAL QUALIFICATION	YES	9(3%)	66(22%)	6.907	0.329
	NO	25(8.33%)	200(66.6%)		
* P< 0.05, Statistically significant at 95% CI (confidence interval)					

From the above table it is evident that there has been association between dermatologic complaints and work profile with p value of 0.000.

4.   Discussion

In this following study, socio demographic details, work profile and its association with occupational hazards, work stress and job satisfaction has been discussed in comparison with other studies conducted elsewhere. In the study, majority of the study participants, 40.7% (n=122),30.7% (n=92), 15.3% (n=46) were under the age group of 25-34 yrs, 35-44 yrs, 15-24 yrs respectively. The overall mean age was 29.8, ranging between 25-34 yrs. In a study conducted by Tadesse et al 9, 60% of the respondents were young, belonging to the age group of 14-29 yrs. Another study done by Saha et al14, 80.36% were under the age group of 15-45 yrs. Joshi et al 16, in their study observed 55% of the respondents in the age group 10-15 yrs and the mean age being 28.68 yrs, which is in close range with our study. The reason for this is, majority of the enterprises prefer younger age group, which would aid in quality working thus leading to increased production in their factories.

It is observed in the study that, nearly 55.7% (n=169) were males and 44.3% (n=133) were females. Joshi et al16 in their study, reported 84.7% as males and the remaining 15.3% as females, which is in concordance with a study done by Nakata et al22, where the males comprised of 70.33% and the females 29.66%. This is because, the work being carried out in factories are so tedious and hence men were usually preferred by the factories. Among the study participants, 29% had a high school educational qualification, 24% were graduates, 17.7% had completed their higher secondary school education, 15% middle school education and 9.7% were illiterates. In a study, done by Nakata et al22, 48.16% had completed their high school education, 28.73% were graduates. Amaravathi et al30, study observed that 39.3% were qualified with high school, 1.4% were graduates, 9.3% with higher secondary school education and 4.3% were illiterates.

In the study 70.7% were involved in the production, 23.3% in the technical wing. Around 34.3% dealt with mechanical works and 65.7% had manual type of work. 52% of the workers were

unskilled. 77.7% of the respondents had a general shift in their factories and 46.3% of the participants had less than 5 yrs of working experience, 34.3% with 5-10yrs. In a study done by Nakata et al[22], it is observed that 54.3% involved in production, 4.5% in the technical side. 68.3% had a working experience of more than 7 yrs. Amaravathi et al[30], observed that 37% had a work experience of 1-3 yrs and 21.4% of the workers had morning shift. There has been a strong association between the work profile and psychosocial hazards (p=0.001, X^2=25.329). It is evident that there exists an association between the work profile and the ocular complaints with p value of 0.00. Majority of the workers had MSD and is in strong association with the work shift (p = 0.00, X2 = 49.642) and the nature of work (p= 0.019, X2 = 9.966).

5.   Risk factors and health problems of workers in small scale factories.

In our present study, 74.25% of the males and 76.69% of the females were exposed to the risk of occupational hazards and 25.74% in males and 23.30% in females were not at the risk of exposure. Similarly, the prevalence of occupational injury in a study conducted by Nakata et al22, reported as 35.6% (male = 43% & females= 17.9%). The prevalence of alcohol dependence in our study was 14.37%. The study reported that around 41.31% of the study participants had moderate nicotine dependence and 5.98% had high dependence. Similarly, Bandyopadhyay10, study observed 38.4% of their study participants with tobacco and alcohol addiction. In addition to this, pyschosocial hazards are also in association with alcohol dependence (p value-0.004, X2=57.285). This is similar to the study conducted by Nakata et al22, where association is observed between smoking and hazards related to their workplace.

In the study, 11.35% of the study participants reported with moderate stress, 39.7% reported fairly low and 42% were calm. It has been evident that the job stress is strongly in association with the type of work and work shift. This is similar to the study conducted by Lai et al 12, where work load, good work relationships, poor communication are being strongly associated with job stress in the small scale enterprises. Our findings for the moderate stress level can be partly explained by the fact that small scale enterprises have a limited workforce and the tasks are incompatible.

In the ocular complaints observed in our study, 15.3% reported with headache, 6.3% with itching and watering of eyes, 4.7% with blurred vision. Similarly, in a study conducted by Bandyopadhyay10, reported with 15.7% of visual difficulties. The study 16 done by Joshi reported that 40.42% of the respondents had complaints of headache. Another study conducted by Chohan 15, reported with 32.5% of eye infections among the study participants. The study found out that the prevalence of oral cavity problems was 2%. In the study done by Kamble et al in Pune among workers in automobile industry; they reported 17. 9 % had oral cavity problems38. Present study, among the workers participated, 5.3 % had ENT problems which was similar to findings in the study done by Kamble et al in Pune where 6.4 % had ENT disorder38.

The study reported that 6.7% had cardiovascular problems, where as in a study done by Vyas et al39 only 3% had cardio vascular problems. This is due to age difference in the study population and the risk factors such as smoking and nicotine dependence also leads to cardiovascular problems among the workers in this study.

Among the workers participated, 10.70% had respiratory problems. The other studies done by Shinde et al45 (2015), Vyas H et al 39, Philip et al 42, Selvithangaraj et al 43 and Kamble et al 38 showed a prevalence of respiratory problem as 22.2%, 20%, 17.9%, 11.3% and 1.1% respectively. This is due to inhalation of the fumes which comes from the chemicals in their workplace, which causes the respiratory problems. In this study it has been found that there was a

significant association between working profile of the participants and respiratory problem. Similar to this study association between exposure to chemicals and respiratory problem was documented in the study done by Philip et al42.

The study participants have shown the prevalence of gastro intestinal problem as8% in the present study. Similar findings were described in the study done by Shinde et al (2015) where the prevalence of gastro intestinal problem was 36. 2%45 . In the other studies done by Philip et al, the prevalence of gastro intestinal problem was 29 . 2%42. In the study done by Selvi Thangaraj et al the prevalence of gastro intestinal problem was 10%43. In this study the working profile of the participants had strong association with gastro intestinal problem.

The prevalence of nervous problem among the study participants in the study has been reported as 4.6%. And only 1.3% of the study participants had numbness problem. This was very less when compared to the study done by Philip et al42 and Shinde et al 45 where the prevalence is 46.2% and 58.5% respectively. The low prevalence in the present study is due to the fact that most of the workers were not exposed to heavy works.

Present study, prevalence of genito urinary problem among the study participants was 4% which is due to socio demographic risks factors such age, diet, and personal habits. A 10 years follow up study among automobile repair workers in The Netherlands, to assess cause specific mortality done by Eva S Hansen showed an increased mortality due to urinary tract cancer47.

6.   Musculoskeletal

The reported prevalence of musculoskeletal problem in the present study was28.3%. Similar findings in the study done by Shinde et al 3 0 and Selvi thangaraj et al 3 3 where the prevalence of musculoskeletal problem is 54. 9% and 62% respectively. In the other studies done by Nasarudden et al, Akter et al and Philip et al 42 the prevalence has been reported as 87.4%, 77%, 44.3% respectively. The prevalence is comparatively low than the other studies as the duration of work differs and is in turn being influenced by the job nature. In this study the workers who were working with manual which has postural difficulties had 29.33% of musculoskeletal problem when compared to workers who were working with machinery tools (9%) and there was a statistically significant association between working manually which is a physical risk factor and musculoskeletal problem. Similar to this study statistically significant association between physical risk factor and musculoskeletal problem was found in the study done by Akter S 50.

Among the workers participated in the study 11.3% had skin problems. Similar findings were seen in the study done by Shinde et al 45. In the other studies done by Philip et al42 and Vyas et al 39, the prevalence of skin problem was 16. 1%, 8% respectively. This is because of handling the machines and exposure of skin to chemicals during their work, which leads to itching and on chronic exposure causes various skin problems

From the participantsit is reported that 39.7%, 11.35%, 5.3% and 1.7% experienced fairly low, moderate stress, severe stress and potentially high stress. In the study done by Edimansyah et al, showed prevalence of self - perceived depressionand anxiety as 35 .4% and 47. 2% respectively48. This difference in our study is because the mental health problem has been assessed using "THE WORKPLACE STRESS SCALE", of The Marlin company, North Haven, CT and the American Institute of stress, Yonkers, NY and not by the self-perceived problems as done in the study by Edimansyah et al 48. The study results found that there was a statistically significant association between the working shift and mental health problem. Working in both day and night is an indirect cause of mental health problem, the workers who are working in day and night shift had altered sleep pattern and sleep disruption leads to mental health problems. The

same was documented in the study which was conducted by sleep researchers at the Sleep and Circadian Neuroscience Institute at the University of Oxford in the United Kingdom, found that "sleep disruption is a driving factor in the occurrence of mental health problems49.

7. Conclusion

This study assessed the health status, the exposure of workers to their workplace hazards and the association between occupational hazards and systemic health problems among workers in small scale factories, Puducherry. The major health problem observed among the study participants was Musculoskeletal disorders reporting 38.3%. The other health problems observed are ocular problems (26.3%), dermatology problems (11.3%), respiratory problems (10.7%), gastrointestinal problems (8%), cardiovascular problems (6.7%), ENT problems (5.4%), nervous problems (4.6%), oral problems (4%), urinary problems (4%).

In the study, there exists a strong association between educational qualification and exposure to occupational hazards. Alcohol and nicotine dependence is associated with nature of work, work shift and their work experience. Job stress and satisfaction has shown association with work profile of the participants. The work shift, place of occupation, nature of work has shown strong association with ocular, respiratory, nervous and GIT problems. Certain health problems like oral, gastrointestinal, dermatology has no association with the work profile. Similarly, alcohol and nicotine dependence has no association with nature of work and job stress. These health problems may be due to other factors like socio demographic and personal habits.

From the findings of the study, the prevalence of exposure to occupational hazards are high in the study area. The various health problems and other risk factors among the workers in small scale factories will reduce only if all the gaps are identified and specific interventions are carried out. The illiterate individuals might benefit most from awareness raising interventions. Greater emphasis should be given to educating and raising awareness about occupational health hazards and safety methods to young workers, non-native workers. Further research should be done, to establish, to specifically identify the factors that make the workers vulnerable to occupational hazards.

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