CHAPTER V

ANALYSIS I - INDUSTRY AND HEALTH PROBLEMS

5.1 OCCUPATIONAL HEALTH

Inside the factories and mines of nineteenth century the workers were exposed to hazards of occupational diseases and adverse effects of long hours of work.

As manufacturing techniques improved, machines became speedier and more dangerous. The new machinery was handled by untrained workers. Toxic hazards increased due to exposure to a wider range of chemicals which were introduced without considering their possible effect on workers. The labourer became exposed to pressure of continuous work at a speed imposed by needs of the production.

The health problems arising from industrial progress in developing countries today are in many aspects, similar to those prevailing in the western countries during industrialisation in the nineteenth century.

Park (1985) observed that workers in the pottery, ceramics, metal grinding, glass industry, slate pencil mines etc. suffer from diseases characterised by respiratory disorder and overall deterioration of health sometimes even resulting in death. Workers of the cotton textile industry

also suffer from chest disorder caused by inhalation of cotton fibre dust. Many chemicals have proved to create allergic conditions among human beings causing skin rashes, blisters, itching, discolouration of skin and even burns.

The modern concept of sound health refers to "The health which is the outcome of interaction between individual and his environment. He is healthy who is well adjusted" (W.H.O).

The health associated problems of a worker in an industry with certain factors like stress and adjustment will help in understanding him in a given situation in a better and a more detailed way.

An attempt has been made in the following pages to identify the health problems associated with different industries. The respondents are grouped into two categories, viz., sufferers and non-sufferers. The infirmities are examined not only across the various categories of industries, but also according to the age of the workers and the years of exposure to the work environment. The analysis has been done both statistically as well as through cartographic representation (Figs.5.11 to 5.16).

1. Chemical Industry: This industry is situated at Nandesari an industrial satellite of Vadodara. The industry for its process of manufacturing, uses many raw materials

Percent distribution of Back problem-Sufferers & Non-sufferers by Age, Years of Exposure and Type of Industry

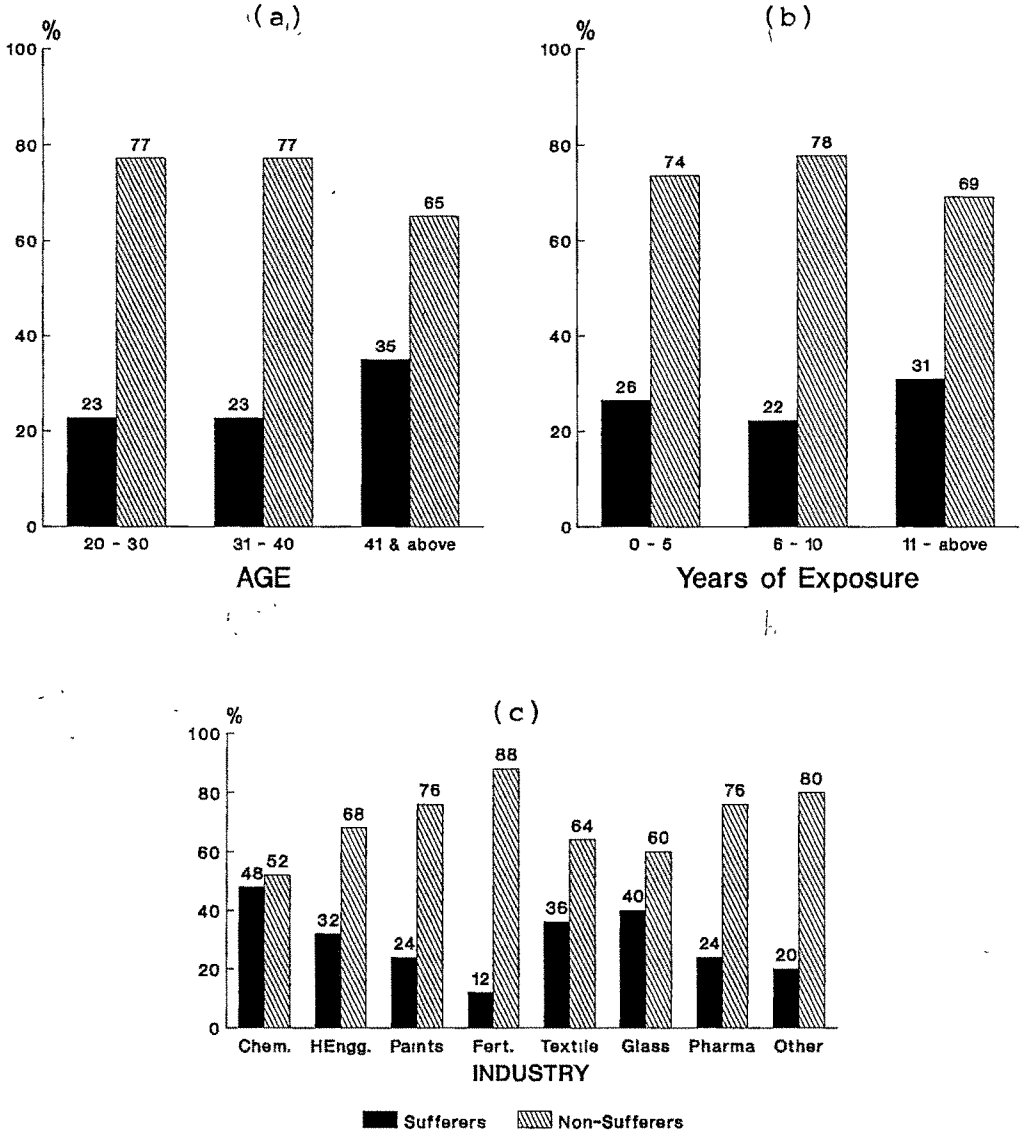

Fig.5.1

TABLE 5.1

HEALTH PROBLEMS IN CHEMICAL INDUSTRY

Type of health problem	Sufferers			Nonsufferers	
	N	%	Rank	N	%
Back	24	48	7	26	52
Neck	15	30	10	35	70
Shoulder	14	28	11	36	72
Hands	18	36	8	32	64
Lower limb	25	50	6	25	50
Respiratory	18	36	8	32	64
Cardiovascular	14	28	11	36	72
Nervous system	13	26	13	37	74
Gastrointestinal system	10	20	15	40	80
Eyes	46	92	1	4	8
Ears	5	10	16	45	90
Skin	32	64	4	18	36
Nose	32	64	4	18	36
Sleep	34	68	3	16	32
Asthma	13	26	13	37	74
Stress	37	74	2	13	26

which are potentially hazardous, some of which are as follows:

1. Acetic acid: Colourless liquid with strong smell. It is likely to catch fire and is corrosive. It is a severe irritant of eye, throat, nose and lungs.

Percent distribution of Neck problem-Sufferers & Non-sufferers by Age, Years of Exposure and Type of Industry

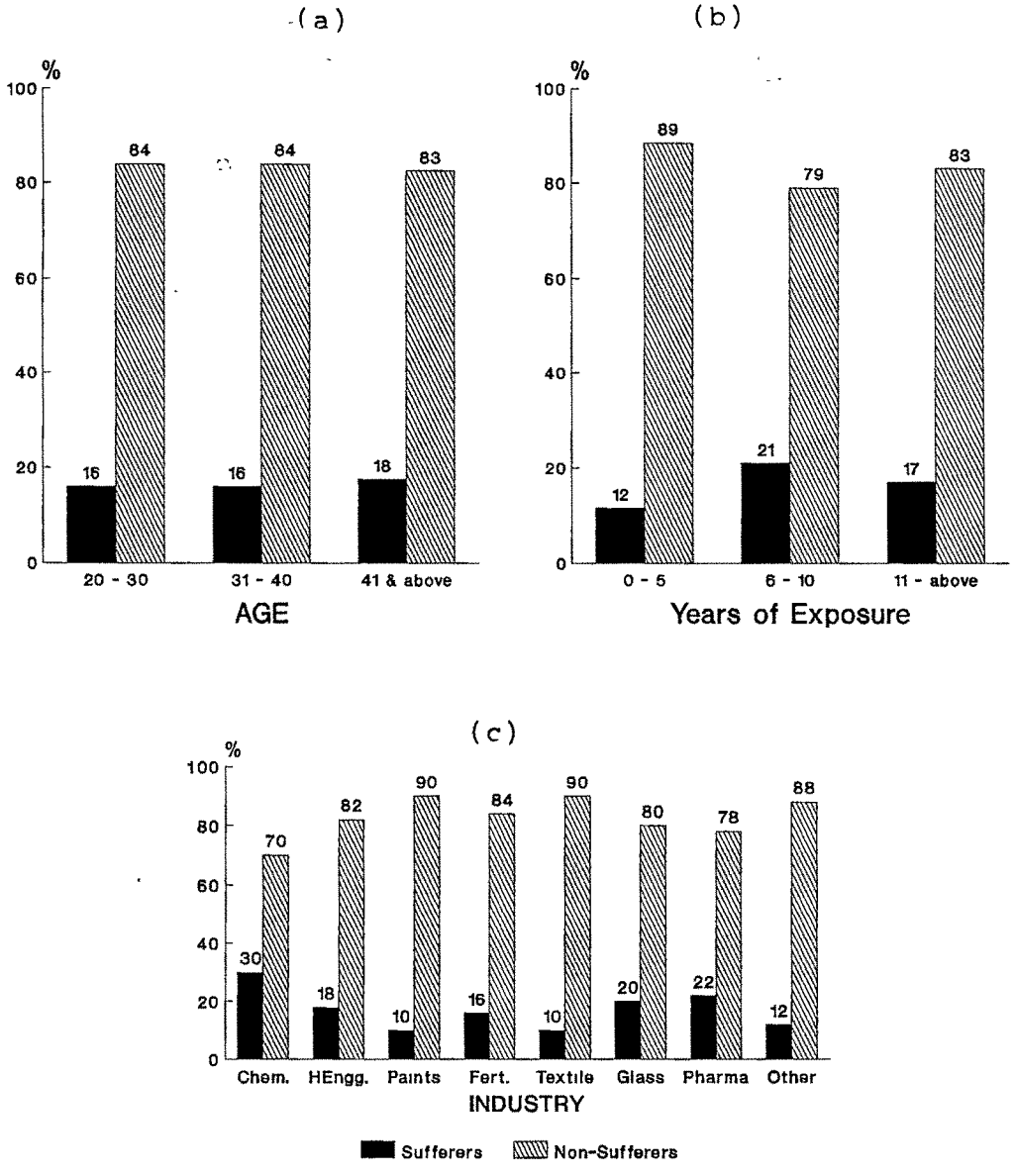

Fig.5.2

2. Ammonia: Colourless gas, lighter than air with irritating smell. It is corrosive. On the skin, it may cause burns and blisters.
3. Sulphuric acid: It is thick oily liquid, highly corrosive. It may cause burns, on skin; breathing its fumes may cause erosion of teeth enamel.

Table (5.1) shows the number of respondents suffering from different types of health problems in the chemical industry. It can be concluded that major health problems confronting workers in the chemical industry are those related to eyes which affect 92% of the workers followed by stress (74%), sleep (68%) and skin and nose (64%). Other problems do not appear significant among the workers. The ear problem (10%) is the lowest among the workers. While the problems of stress and sleep may be indirect effects of the potential hazards in the chemical industry, the other problems may well be associated with the handling of materials already defined.

(Contd....)

TABLE 5.2

HEALTH PROBLEMS IN HEAVY ENGINEERING INDUSTRY

Type of Problems	Sufferers			Nonsufferers	
	N	%	Rank	N	%
Back	16	32	4	34	68
Neck	9	18	11	41	82
Shoulder	17	34	3	33	66
Hands	12	24	8	38	76
Lower limb	15	30	5	35	70
Respiratory	5	10	13	40	80
Cardiovascular	10	20	10	40	80
Nervous system	6	12	12	44	88
Gastrointestinal system	2	4	16	48	96
Eyes	15	30	5	35	70
Ear	14	28	7	36	72
Skin	4	8	14	46	92
Nose	11	22	9	39	78
Sleep	23	46	2	27	54
Asthma	3	6	15	47	94
Stress	29	58	1	21	42

2. Heavy Engineering Industry: The indsutry manufactures aluminium extruded shapes and sections, false ceilings, bus body, and architectural sections. The workers are exposed to heavy physical work, high temperatures, noise and some chemicals used in different processes.

Percent distribution of Shoulder problem-Sufferers & Non-sufferers by Age, Years of Exposure and Type of Industry

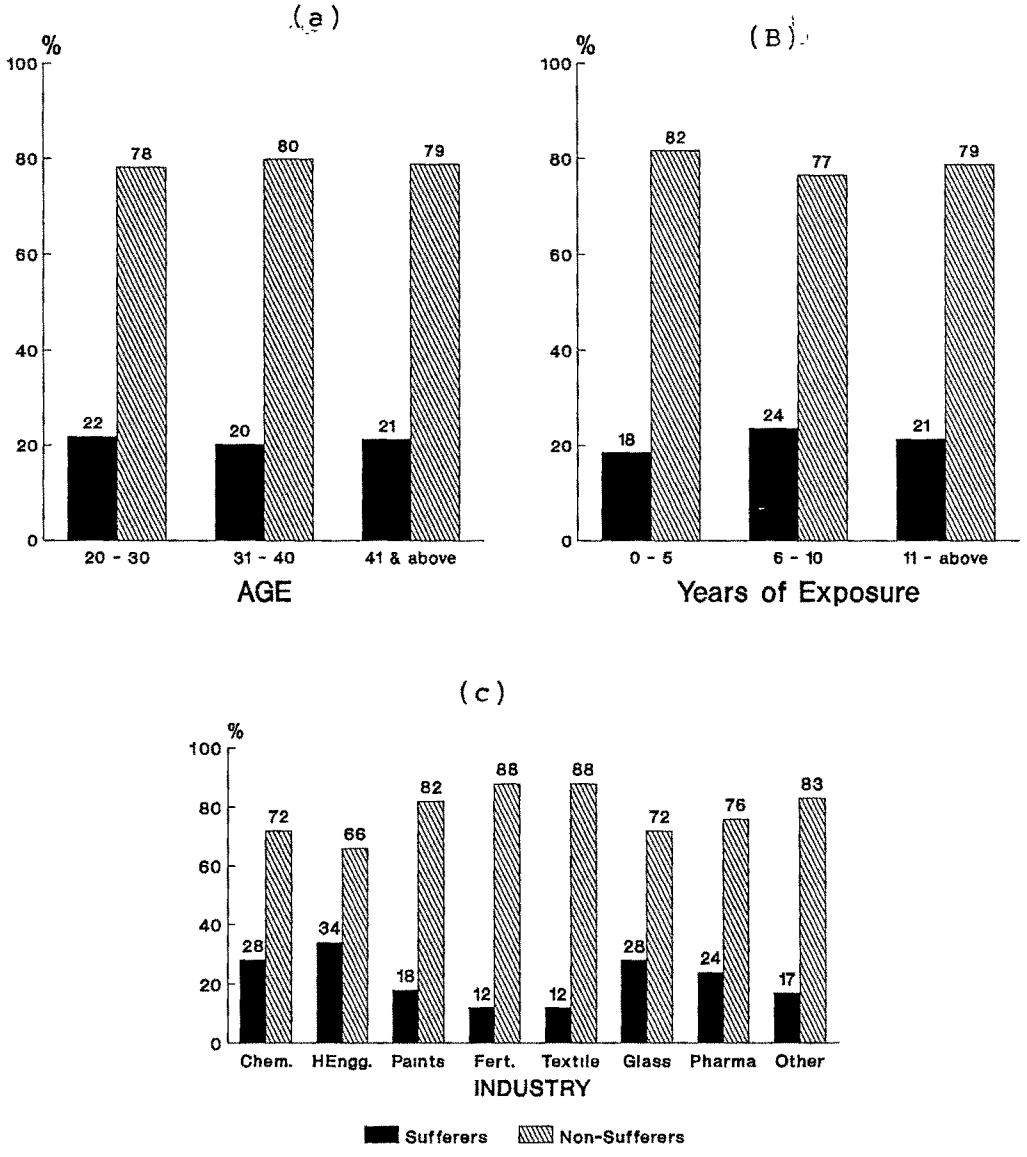

Fig.5.3

As evident from Table (5.2) among workers employed in the heavy engineering industries, back infirmity was reported high in 16(32%) respondents (Fig.5.1) Another 17(34%) of respondents have high rate of shoulder problems. There are 15(30%) respondents who have high rate of problems of lower limb. There are 15(30%) respondents with high rate of eye sufferings, while 14(28%) respondents have high ear infirmity. Other major problems noted are disturbed sleep problem reported by 46% of the respondents and stress suffered by 58%.

The major health problems in heavy engineering industry as evident from the table are stress (58%) followed by sleep (46%), shoulder (34%) and back (32%). While the lowest suffering is of the gastrointestinal system .

(contd.....)

TABLE 5.3

HEALTH PROBLEMS IN PAINT INDUSTRY

Type of health problems	Sufferers			Nonsufferers	
	N	%	Rank	N	%
Back	12	24	8	38	76
Neck	5	10	14	45	90
Shoulder	9	18	10	41	82
Hands	8	16	12	42	84
Lower limb	21	42	3	29	58
Respiratory system	17	34	6	33	66
Cardiovascular	1	2	16	49	98
Nervous system	4	8	15	46	92
Gastrointestinal system	6	12	13	44	88
Eyes	31	62	2	19	38
Ears	18	36	5	32	64
Skin	21	42	3	29	58
Nose	16	32	7	34	68
Sleep	10	20	9	40	80
Asthma	9	18	10	41	82
Stress	40	80	1	10	20

3. Paint Industry: This industry manufactures synthetic enamel paints, oil-bound distemper, primer, varnishes, and thinner. The workers are exposed to chemicals, and physical work.

Percent distribution of Hands problem-Sufferers & Non-sufferers by Age, Years of Exposure and Type of Industry

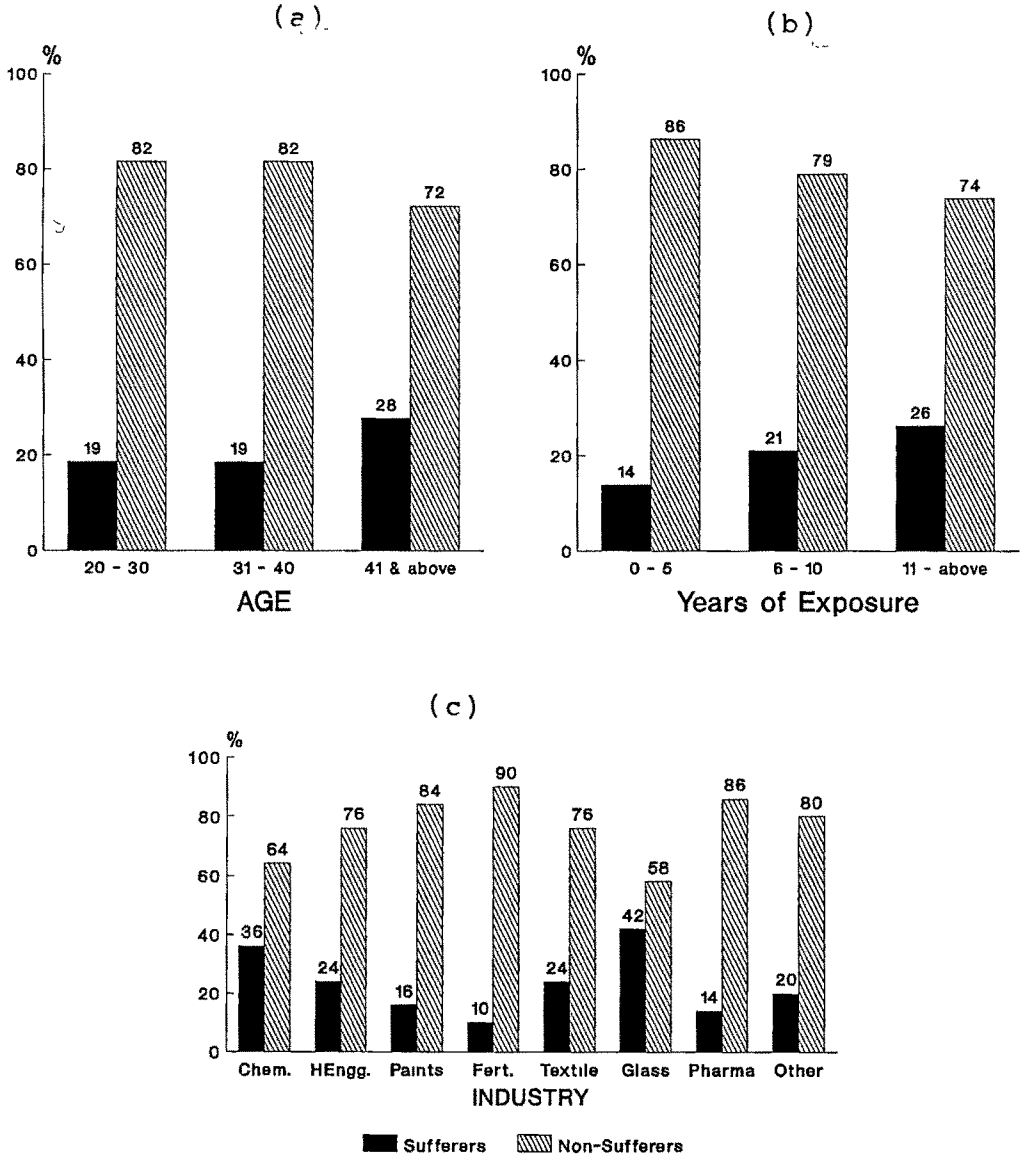

Fig.5.4

There are 9(18%) respondents with high rate of asthma. There is a high stress rate of 40(80%). Thus, it is clear tha majority of respondents suffer from stress infirmity. Thus, it can be summarised that in paint industry the major health problem among respondents is of stress (80%) followed by eyes (62%) and skin (42%) and lower limb (42%). The cardiovascular problem is the lowest with 2% preceded by problems of the nervous system (8%). The problem of eyes and skin suffered by the workers could be related to the nature of chemicals handled by them in the paint industry. The exposure to physical labour in this industry could account for the high percentage of workers suffering from lower limb problem.

(contd.....)

TABLE 5.4

HEALTH PROBLEMS IN FERTILIZER INDUSTRY

Type of health problems	Sufferers		Rank	Nonsufferers	
	N	%		N	%
Back	6	12	6	44	88
Neck	8	16	4	42	84
Shoulder	6	12	6	44	88
Hands	5	10	11	45	90
Lower Limb	13	26	2	37	74
Respiratory system	2	4	13	48	96
Cardiovascular system	4	8	12	46	92
Nervous system	2	4	13	48	96
Gastrointestinal system	6	12	6	44	88
Eyes	2	4	13	48	96
Ears	6	12	6	44	88
Skin	6	12	6	44	88
Nose	8	16	4	42	84
Sleep	10	20	3	40	80
Asthma	2	4	13	48	96
Stress	21	42	1	29	58

4. Fertilizer Industry: Urea, ammonium sulphate, Diammonium phosphate, sulphuric acid, liquid ammonia are the manufactured products of this industry. The workers are exposed to variety of chemicals.

Percent distribution of Lower Limb problem-Sufferers & Non-sufferers by Age, Years of Exposure and Type of Industry

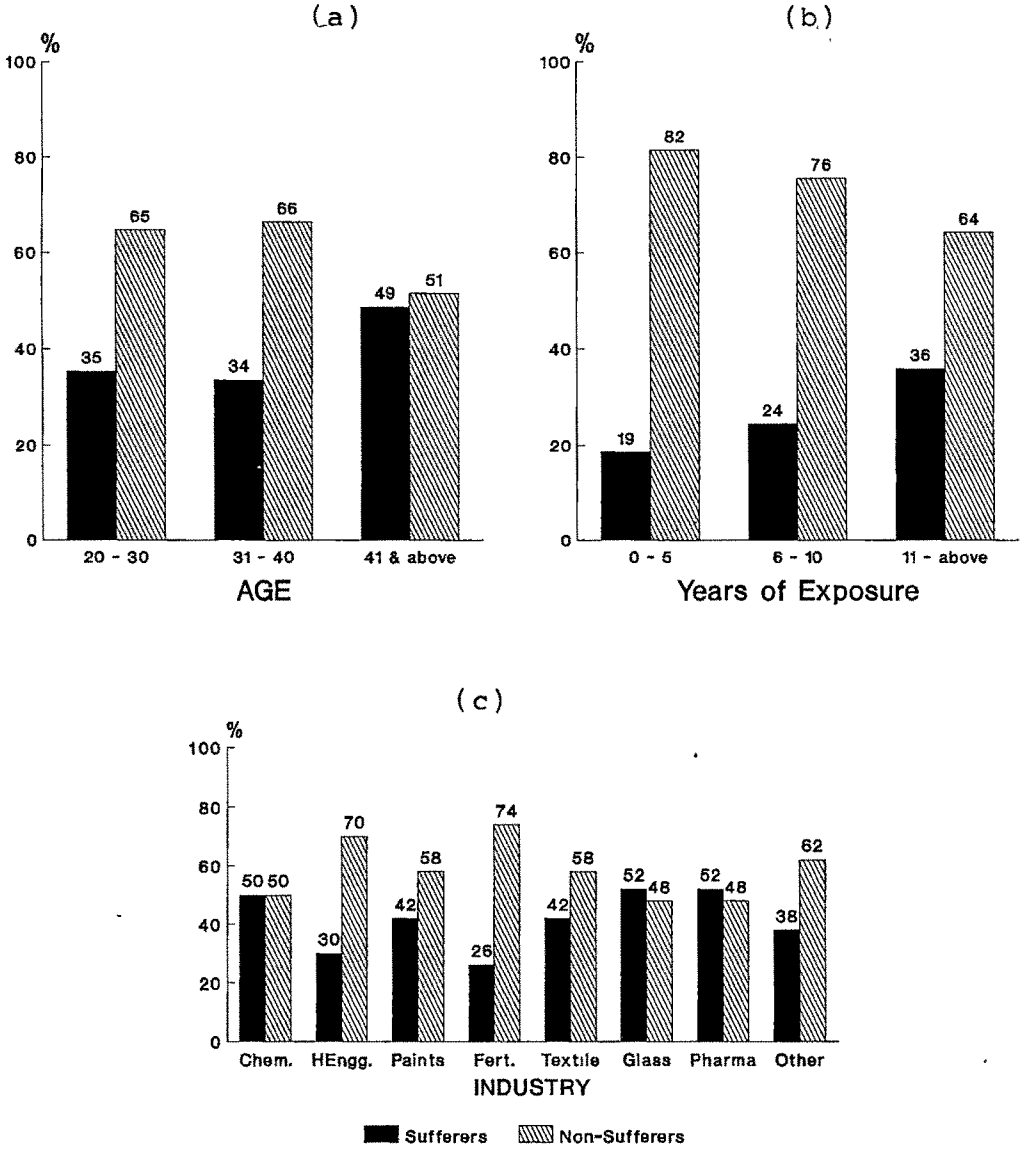

Fig.5.5

Table 5.4 shows the health problems in the fertilizer industry. It can be summarised that in the fertilizer industry, stress is a major problem followed by lower limb (26%) and sleep (20%). Other problems do not appear significant among the workers. Although in this industry the handling of chemicals is high, the related health problems are minimum. This could be due to the precautionary measures adopted by this firm, which helps to show that the health problems can be controlled through the adoption of appropriate measures.

(Contd.....)

TABLE 5.5

HEALTH PROBLEMS IN TEXTILE INDUSTRY

Type of health problems	Sufferers			Nonsufferers	
	N	%	Rank	N	%
Back	18	36	7	32	64
Neck	5	10	13	45	90
Shoulder	6	12	12	44	88
Hands	12	24	10	38	76
Lower Limb	21	42	4	29	58
Respiratory system	20	40	6	30	60
Cardiovascular system	13	26	9	37	74
Nervous system	8	16	11	42	84
Gastrointestinal system					
Eyes	25	50	3	25	50
Ears	3	6	15	47	94
Skin	4	8	14	46	92
Nose	27	54	2	23	46
Sleep	38	76	1	12	24
Asthma	14	28	8	36	72
Stress	21	42	4	18	36

5. Textile Industry: The industry manufactures cotton textile. The process involves exposure to cotton dust, physical work is also heavy in this industry. The workers of the card room are exposed to fine cotton dust.

Percent distribution of Respiratory system problem-Sufferers & Non-sufferers by Age, Years of Exposure and Type of Industry

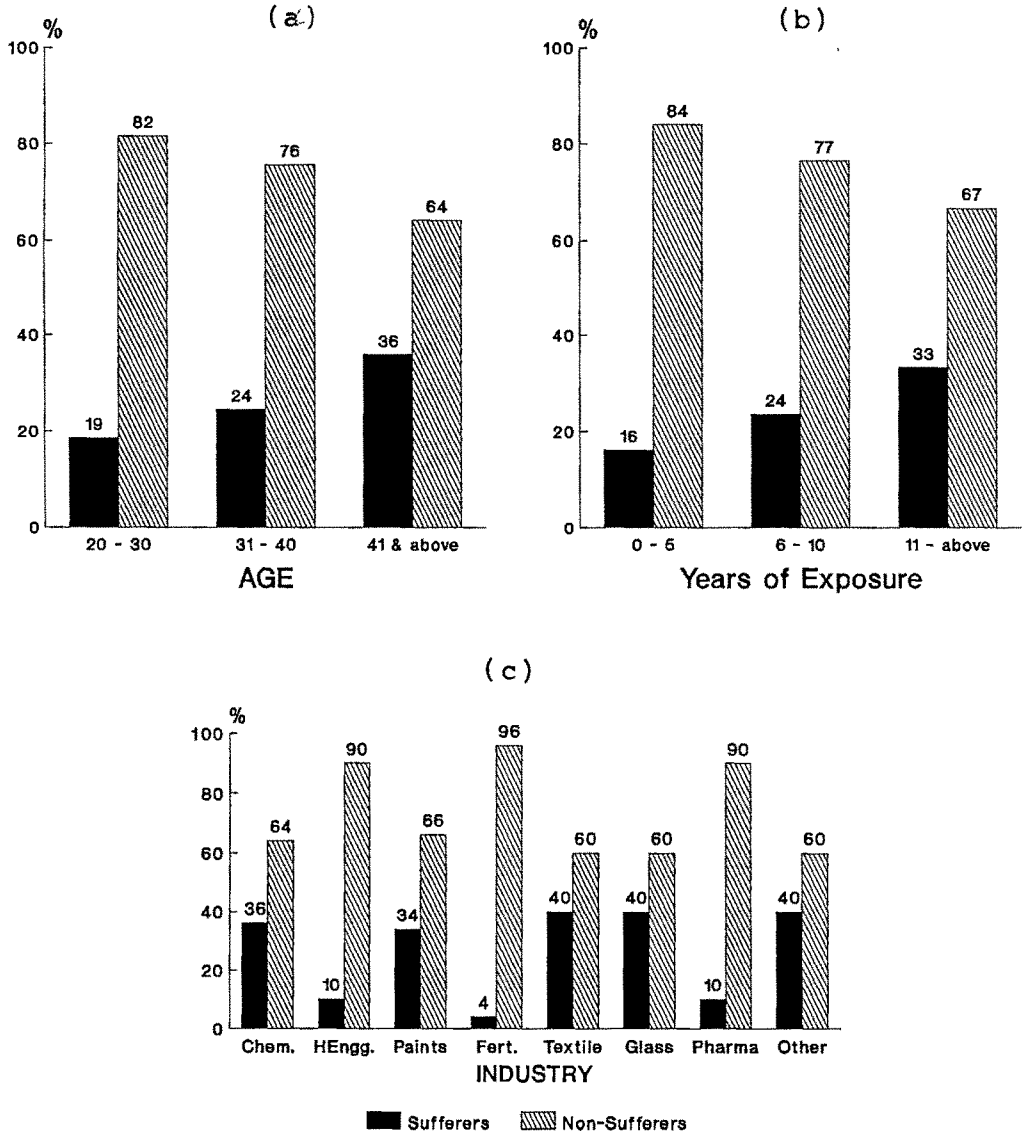

Fig.5.6

It is clear from the table that among the workers employed in the textile industry, the major health problem is sleep (76%) followed by nose (54%), eyes (50%) and stress and lower limb (42%). The ear problem is the lowest preceded by skin. The exposure to cotton dust could cause irritations in the nose and respiratory system as a result of which the percentage of workers affected by these problems is high.

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Percent distribution of Cardio Vascular System problem-Sufferers & Non-sufferers by Age, Years of Exposure and Type of Industry

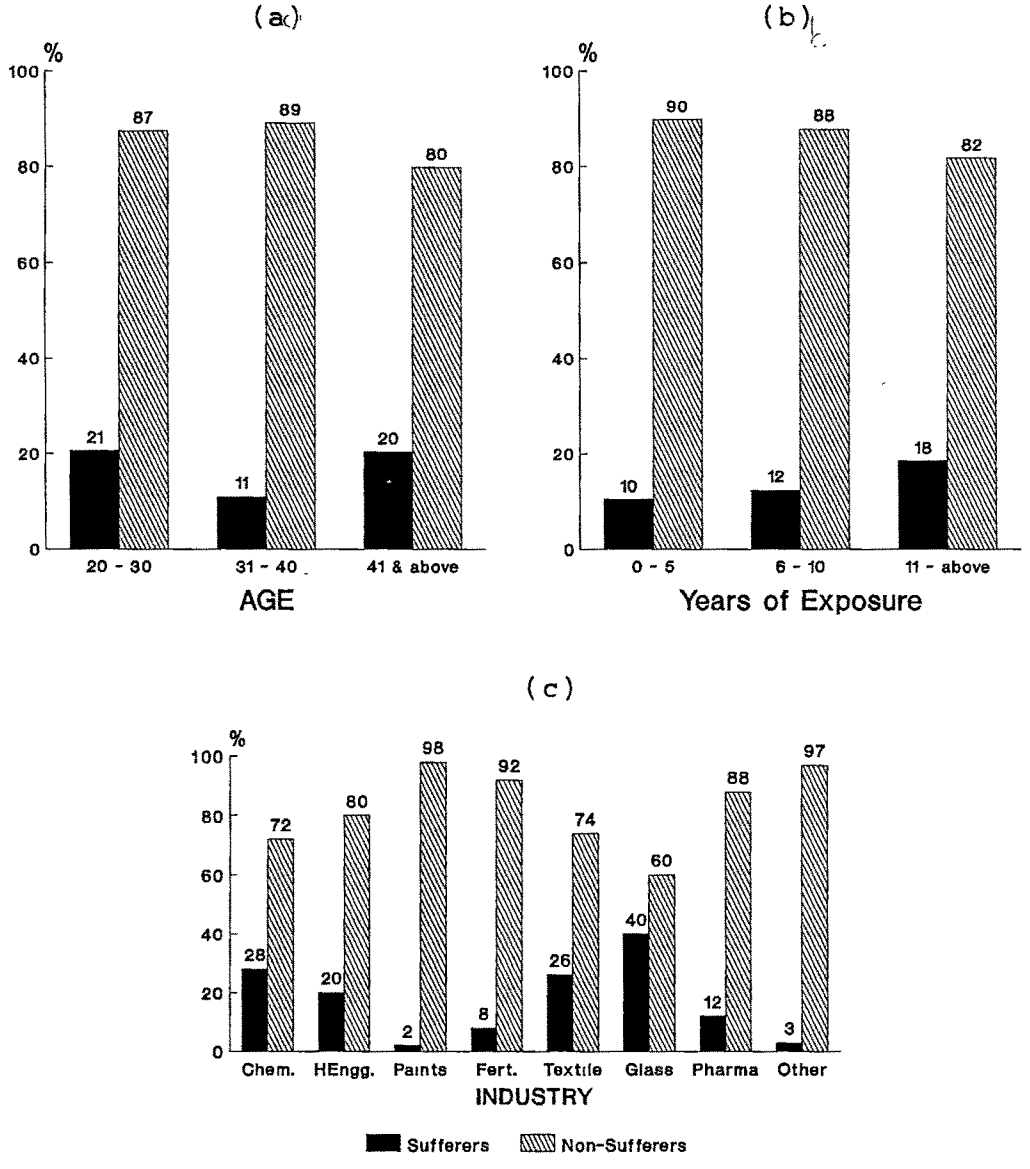

Fig.5.7

TABLE 5.6

HEALTH PROBLEMS IN GLASS INDUSTRY

Type of health problem	Sufferers			Nonsufferers	
	N	%	Rank	N	%
Back	20	40	6	30	60
Neck	10	20	16	40	80
Shoulder	14	28	13	36	72
Hands	21	42	5	29	58
Lower Limb	26	52	4	24	48
Respiratory system	20	40	6	30	60
Cardiovascular system	20	40	6	30	60
Nervous system	19	38	9	31	62
Gastrointestinal system	12	24	14	38	76
Eyes	34	68	1	16	32
Ears	15	30	12	35	70
Skin	12	24	14	38	76
Nose	28	56	3	22	44
Sleep	29	58	2	21	42
Asthma	18	36	11	32	64
Stress	29	38	9	21	42

6. Glass Industry: The glass manufacturing process involves exposure to free floating silica dust and high temperature where the exposure to dust is maximum. Thus workers are found to be suffering from silicosis, a disease caused by the exposure to silica dust.

The process of glass manufacturing requires high temperature and thus the workers are also exposed to high heat levels.

It is evident that the major suffering in the glass industry is related to eyes (68%) followed by sleep (58%), nose (56%), lower limb (52%) hands (42%), Respiratory, cardiovascular systems and Nervous systems (40% each). Neck problem (20%) is the least of all the health problems associated with the industry. The free floating silica dust may easily enter into the eyes and can be inhaled by the workers accounting for the large percentage of workers reporting problems of the eyes and nose. Although silicosis cases are not identified, the high percentage of workers with problems of the respiratory system may be significant.

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Percent distribution of Nervous System problem-Sufferers & Non-sufferers by Age, Years of Exposure and Type of Industry

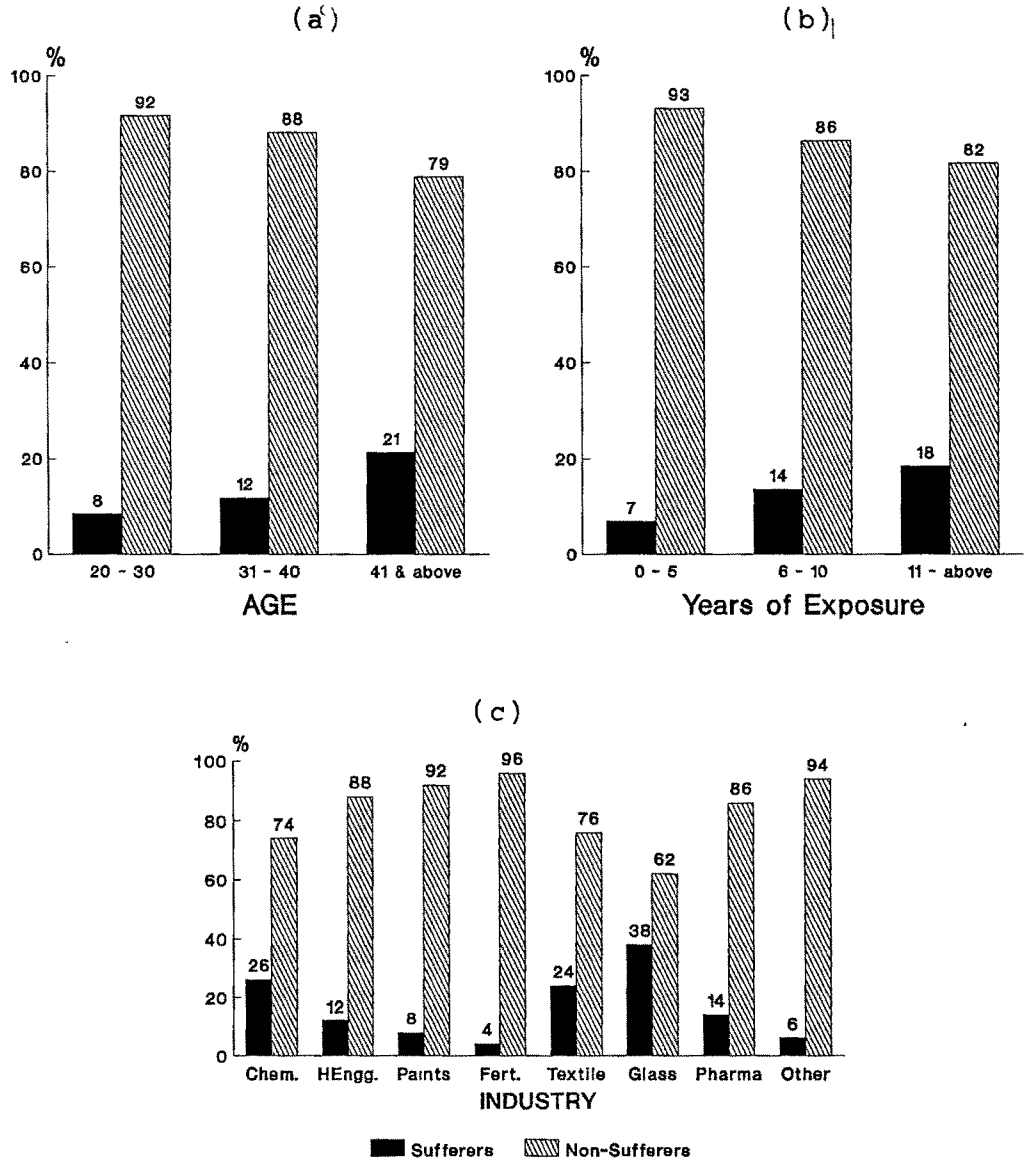

Fig.5.8

TABLE 5.7

HEALTH PROBLEMS IN PHARMACEUTICAL INDUSTRY

Type of health problems	Sufferers			Nonsufferers	
	N	%	Rank	N	%
Back	12	24	5	38	76
Neck	11	22	7	39	78
Shoulder	12	24	5	38	76
Hands	7	14	11	43	86
Lower Limb	26	52	3	24	48
Respiratory system	5	10	15	45	90
Cardiovascular	6	12	14	44	88
Nervous system	7	14	11	43	86
Gastrointestinal	5	10	15	45	90
Eyes	14	28	4	36	72
Ears	8	16	10	42	84
Skin	11	22	7	39	78
Nose	10	20	9	40	80
Sleep	28	56	2	22	44
Asthma	7	14	11	43	86
Stress	33	66	1	17	34

7. Pharmaceutical Industry: The workers in this industry might be exposed to the inhalation of the fine medicinal dust.

Percent distribution of Gastro-Intestinal System problem-Sufferers & Non-sufferers by Age, Years of Exposure and Type of Industry

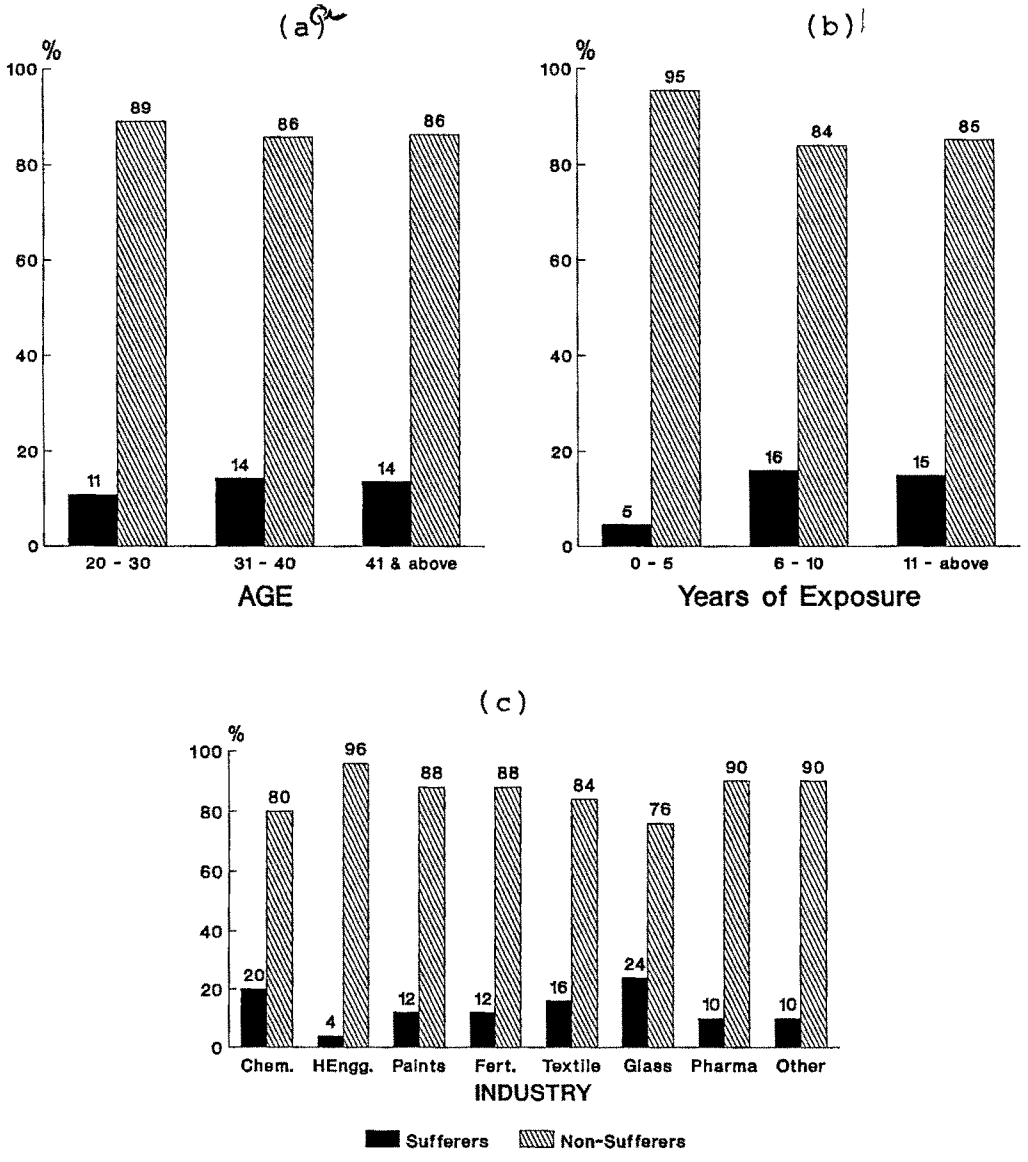

Fig.5.9

Table (5.7) shows the health problems in Pharmaceutical Industry. The major problem appears to be stress followed by sleep, and lower limbs, eye, shoulder, back, while the lowest infirmity is of the gastro-intestinal system and of the respiratory system preceded by nervous system and asthma problems. No apparent relationship between the infirmities and the industrial environment of the Pharmaceutical industry was visible in the study.

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Percent distribution of Eyes problem-Sufferers & Non-sufferers by Age, Years of Exposure and Type of Industry

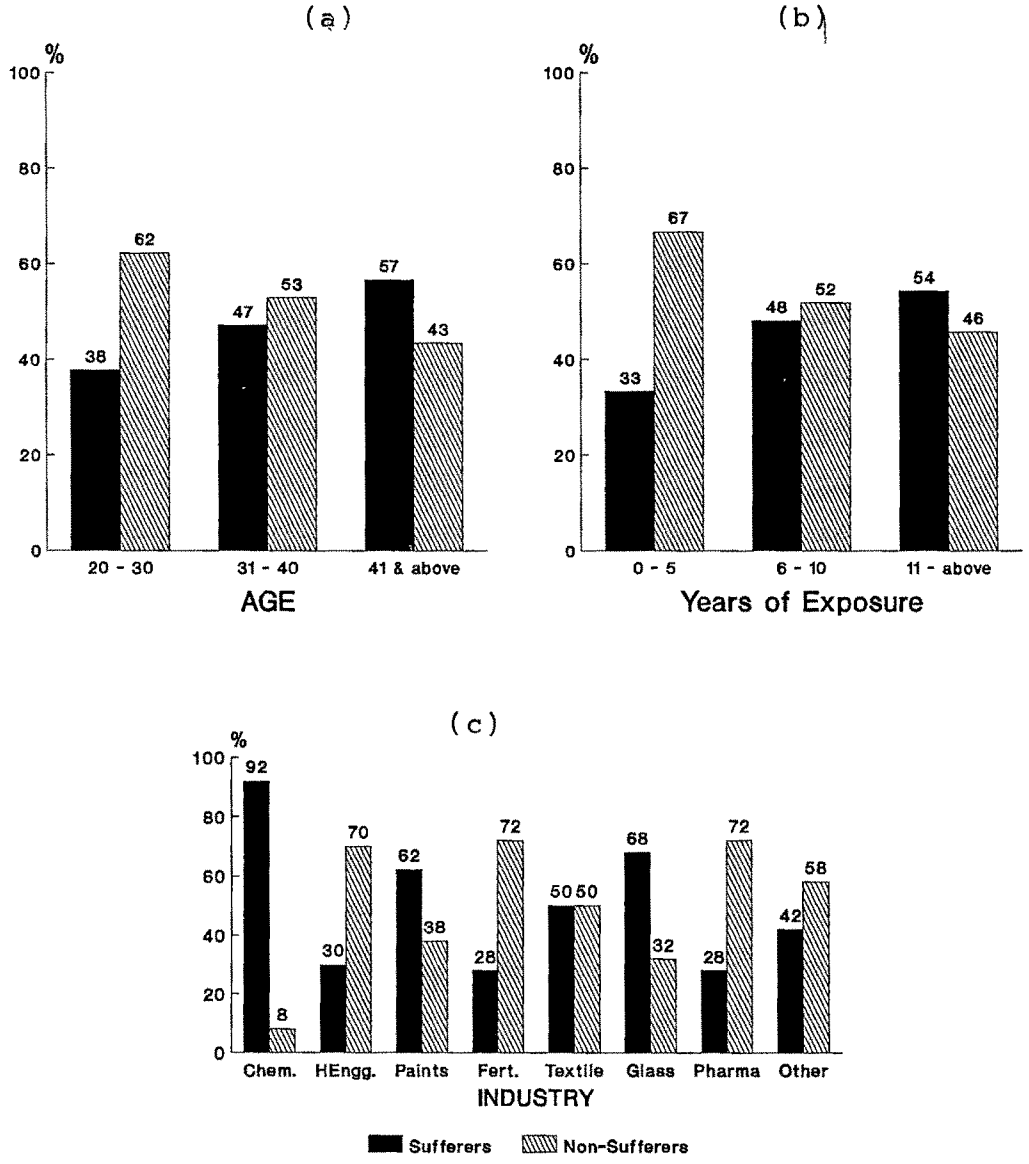

Fig.5.10

TABLE 5.8

HEALTH PROBLEMS IN OTHER INDUSTRIES (UNORGANISED SECTOR)

Type of health problems	Sufferers		Rank	Nonsufferers	
	N	%		N	%
Back	20	20	7	80	80
Neck	12	12	12	88	88
Shoulder	17	17	9	83	83
Hands	20	20	7	80	80
Lower Limbs	38	38	4	62	62
Respiratory system	40	40	3	60	60
Cardiovascular system	3	3	16	97	97
Nervous system	6	6	14	94	94
Gastrointestinal system	10	10	13	90	90
Eyes	42	42	2	58	58
Ears	5	5	15	95	95
Skin	14	14	11	86	86
Nose	30	30	5	70	70
Sleep	30	30	5	70	70
Asthma	17	17	9	83	83
Stress	65	65	1	35	35

8. Other Industries: This category includes four types of industries involving the unorganised labour force, viz., (1) flour millers exposed to powdery flour and noise of machine, (2) Mattress workers exposed to cotton dust, (3) Cooks exposed to constant heat and smoke, and (4) Masons engaged in heavy physical work, with a limited exposure to chemicals.

Percent distribution of Ears problem - Sufferers & Non-sufferers by Age, Years of Exposure and Type of Industry

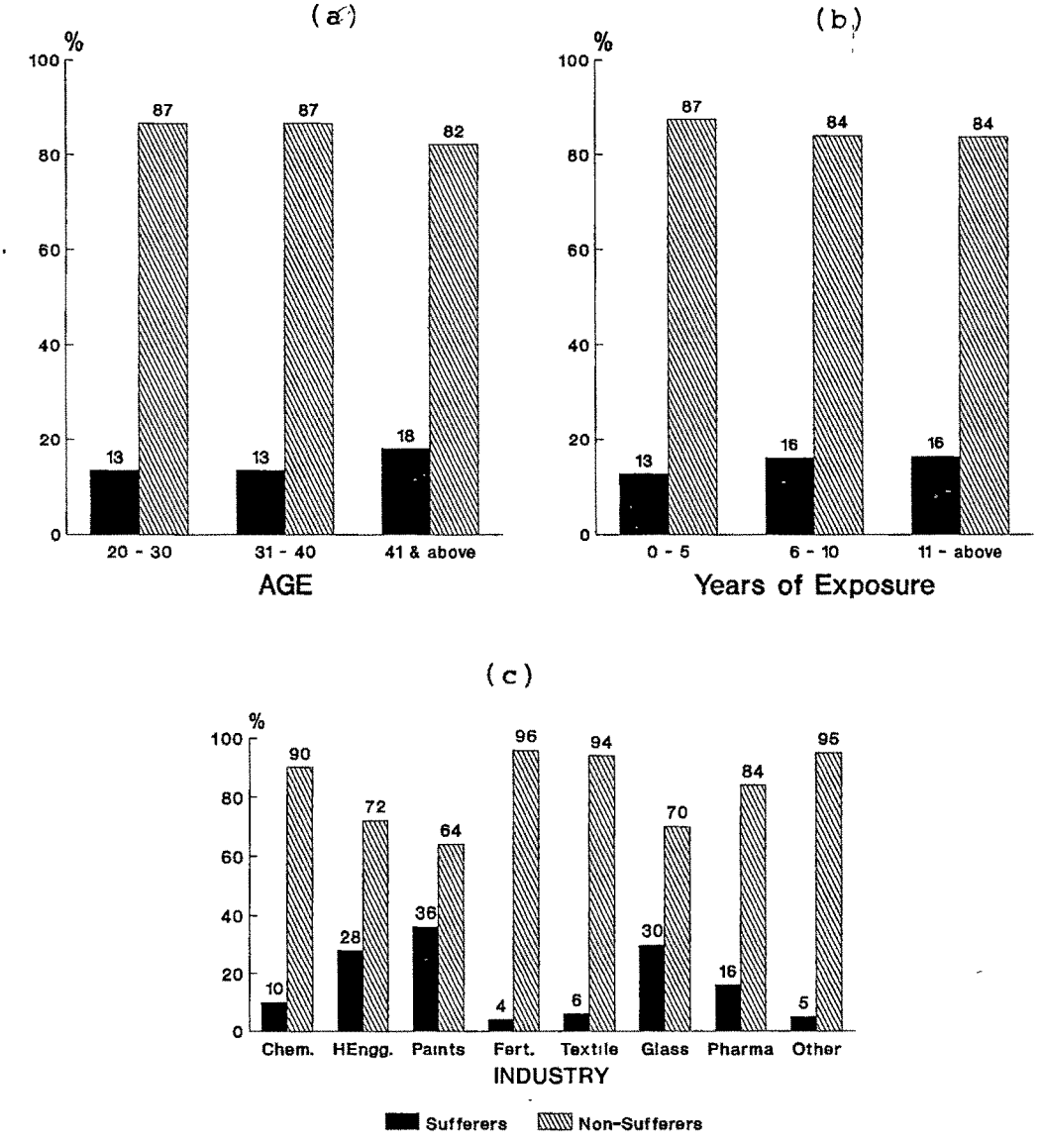

Fig.5.11

The major problem in the unorganised sector worker is stress (65%), followed by eyes (42%), respiratory system (40%), and lower limb (38%). The cardiovascular system is the least of the health problems among these workers. Given the nature of their work, these workers in the unorganised sector are exposed to large amounts of free floating dust which affect their eyes, nose and respiratory system. The physical labour they have to undergo is also very heavy which is reflected inthe large percentage affected by problem of the lower limb.

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Percent distribution of Skin problem-Sufferers & Non-sufferers by Age, Years of Exposure and Type of Industry

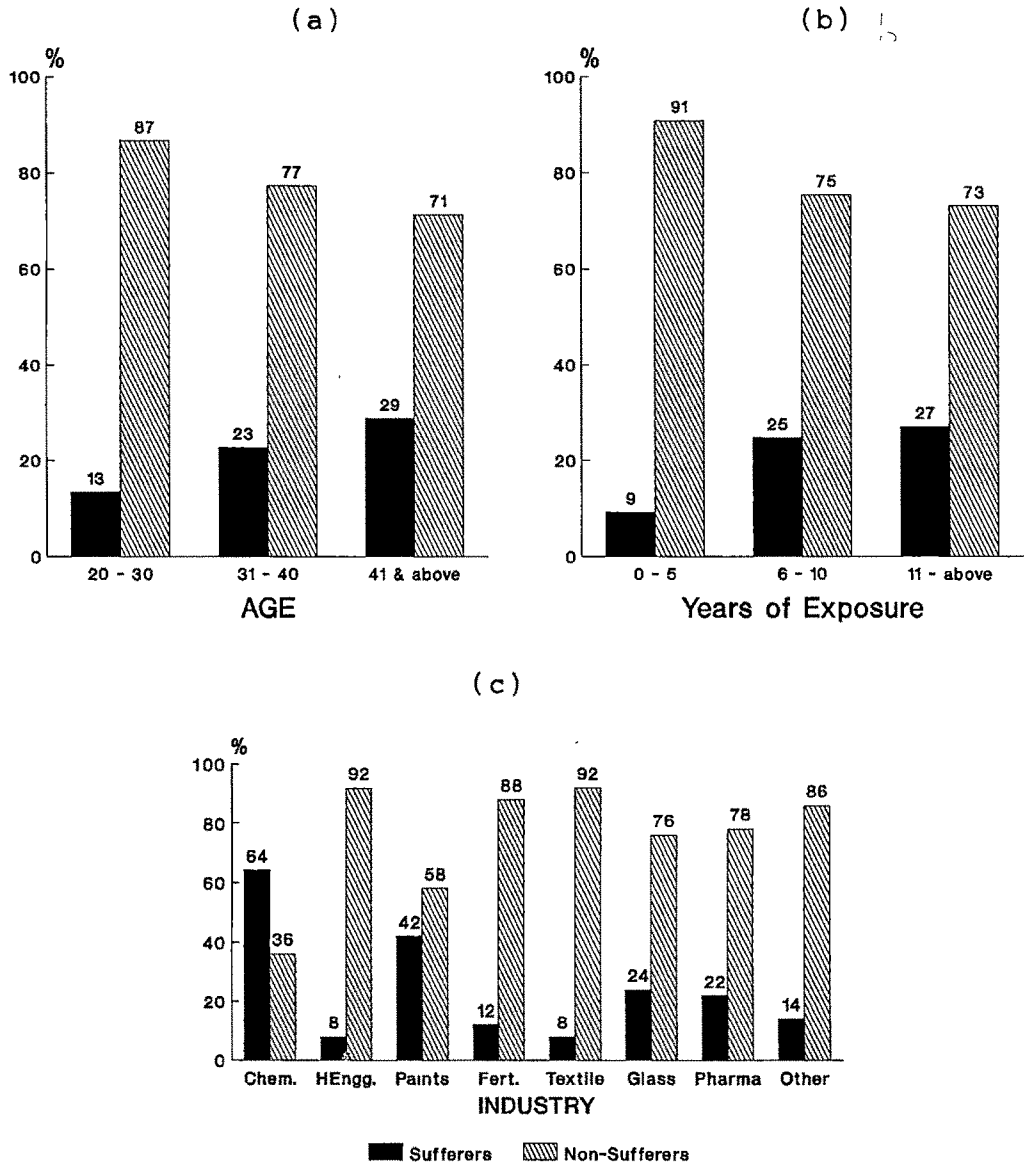

Fig.5.12

Table 5.9

SUFFERINGS AND TYPE OF INDUSTRY

Infirmities	Industrial category						
	Chem	H.E	Phar	Text	Fert	Paints	Glass
	(Percentage of workers suffering)						
Back	48	32	24	36	12	24	40
Neck	30	18	22	10	16	10	20
Shoulder	28	34	24	12	12	18	28
Hands	36	24	14	24	10	16	42
Lower Limbs	50	30	52	42	26	42	52
Respiratory	36	10	10	40	4	34	40
Cardiovascular	28	20	12	26	8	2	40
Nervous system	26	12	14	24	4	8	38
Gastrointestinal	20	4	10	16	12	12	24
Eyes	92	30	28	50	4	62	68
Ears	10	28	16	6	12	36	30
Skin	64	8	22	8	12	42	24
Nose	64	22	20	54	16	32	53
Sleep	68	46	56	76	20	20	58
Asthma	26	6	14	28	4	18	36
Stress	74	58	66	42	42	80	38

Among the major physical problems found in most of the categories of industries, except in fertilizers are those connected with lower limbs. The problem may have arisen due to

Percent distribution of Nose problem-Sufferers & Non-sufferers by Age, Years of Exposure and Type of Industry

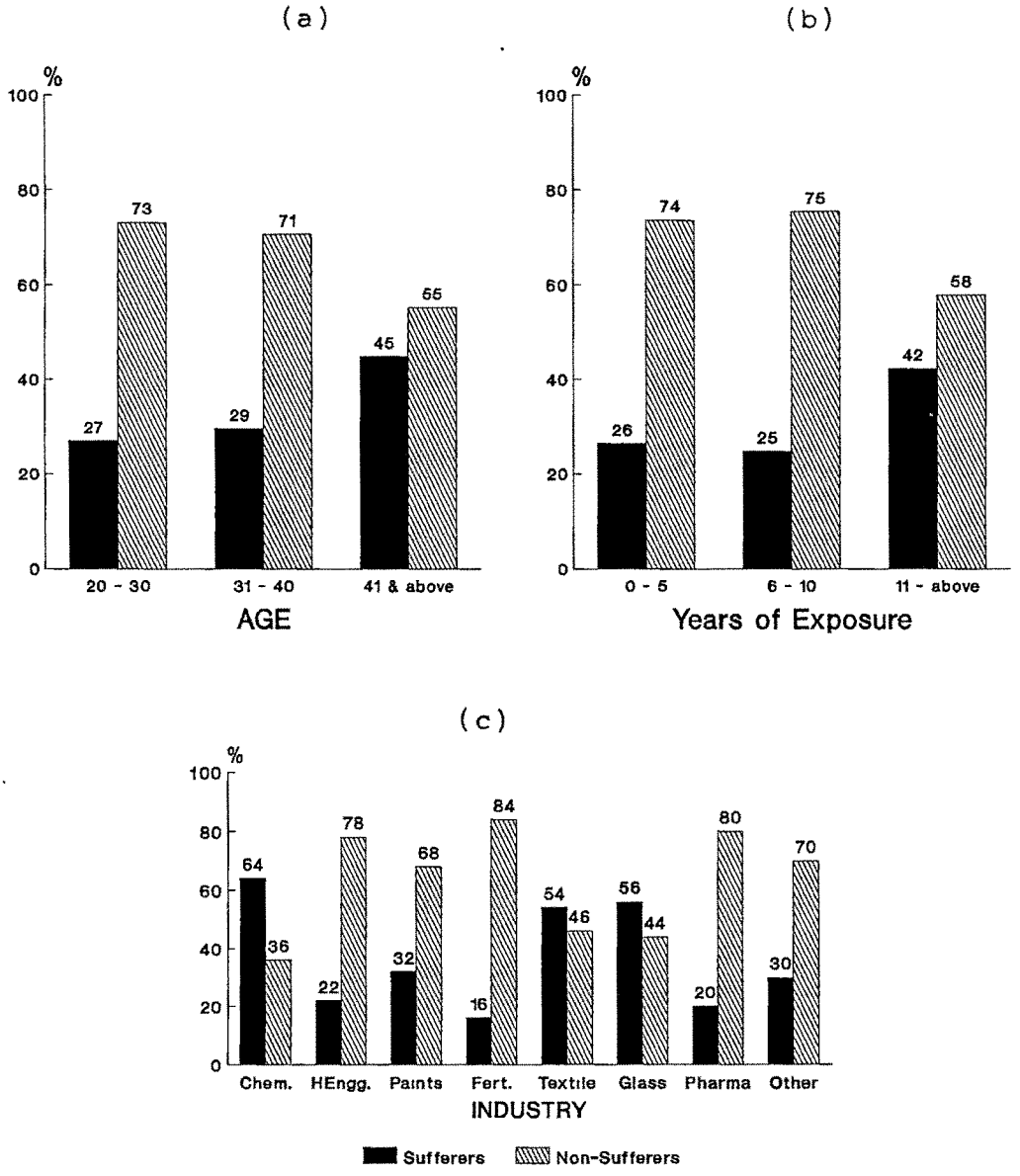

Fig.5.13

the posture. Most of the industries require constant standing posture with more number of hours of work.

The shoulder and hand problem is associated with heavy loads which is less in fertilizers. Respiratory system, nose and asthma problems are associated with inhaling of toxic chemicals and dust particles. These problems are high in chemical, textile, paints and glass industries. Similarly eye problems are associated with fumes, smoke of various chemical compounds used during processing which is high among chemicals followed by glass, paints and textiles.

The above problems are physical which show some relation between man with machine and between man and various physical and chemical agents.

The association between different categories of industries and the various health problems have been tested statistically, using analysis of variance. The results are analysed in Tables (5.11) to (5.25).

STRESS AND SLEEP

Stress is a dynamic condition in which an individual is confronted with an opportunity, constraints, or demand related to what he or she desires and for which the outcome is perceived to be uncertain or important (Schuler 1980).

Percent distribution of Sleep problem-Sufferers & Non-sufferers by Age, Years of Exposure and Type of Industry

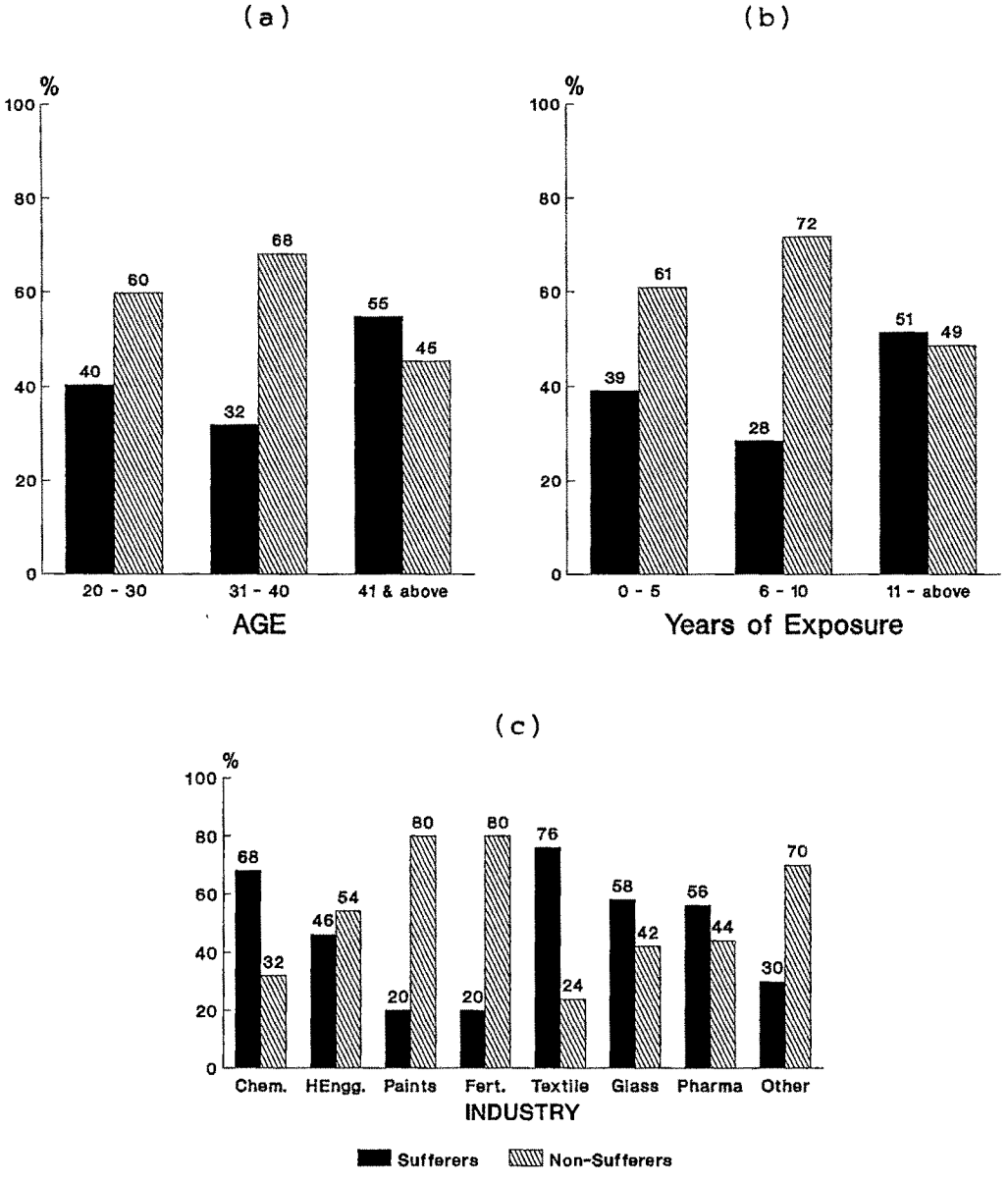

Fig.5.14

The term stress has widespread use and multiple meaning. It has been used to mean a stimulus (for example, being exposed to a stressful situation), a response (for example behaving in a particular manner), or a subjective experience (for example in the sense of feeling under stress). Thus, as stated earlier, stress is also an important determinant for the employee's functioning and his health. It is the impact of modern industrial society.

There are many psycho-social factors which operate at the work place. These are human relationships amongst workers themselves and between workers and authorities. The factors include the type and rhythm of work, work stability, service conditions, job satisfaction, leadership style, security, worker participation, communication, system of payments, welfare conditions, degree of responsibility, trade union activities and a host of similar factors.

In modern occupational health the emphasis is upon people, the condition in which they live and work, their hopes, their attitudes towards their job, their fellow workers and employers. Stress at work may disturb his sleep and family relations.

When the various problems are examined across the different type of industries, it is evident that in almost all industries stress is a major problem although there may be some variation in the intensity of the problem (Table 5.10).

A similar association is noted from the statistical analysis as shown in Tables (5.24 and 5.26).

Table 5.10

Stress Factors	Industrial Category (Number of Respondents)						
	Chem	H.E	Phar	Text	Fer.	Paints	Glass
1. Job insecurity	18	9	20	10	-	19	8
2. Tensed due to day's happening	2	11	-	-	8	-	
3. Irritation	-	1	-	-	10	-	-
4. Problems due to job	5	-	3	-	1	-	1
5. Pay	12	5	10	11	-	21	9
6. Emotional	-	3	-	-	2	-	1
Total Respondents	37	29	33	21	21	40	19

Owing to the fact that this problem pervades all industrial workers, the consequences of an industrial environment are brought into sharp focus. It is evident that insecurity of the job is the main source of stress in most industries, being maximum in pharmaceuticals, paints and chemical industries. The impairement in health as a result of working in these industries is a major contributing factor. If

Percent distribution of Asthma problem-Sufferers & Non-sufferers by Age, Years of Exposure and Type of Industry

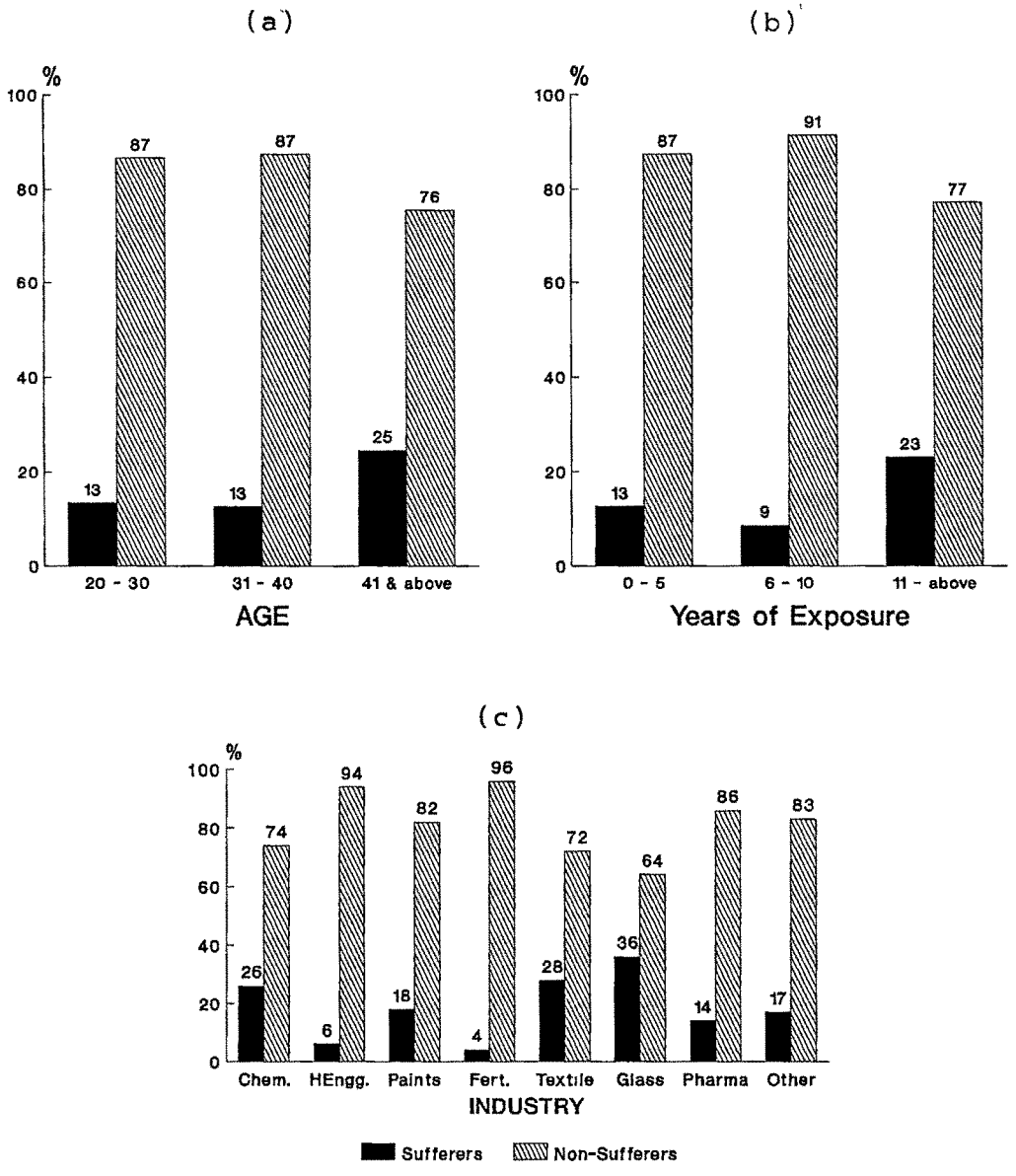

Fig.5.15

the workers fall prey to any occupational health problem, they are summararily dismissed. This enhances their sense of insecurity which is the main cause of stress. The problem of stress and sleep are all prevading and rank heighest among the health problems in practically all industries. These findings bring into focus the fact the industrial environment prevailing today is far from conducive to generate a sense of contentment among the people who work within this environment. The various industrial raw materials and industrial processes create conditions that lead to varying health problems in different industries. This emphasises the need for control measures for checking the adverse effects of the industrial environment. The need for providing a better environment in terms of working conditions, safety measures and work security become evident.

Percent distribution of Stress problem-Sufferers & Non-sufferers by Age, Years of Exposure and Type of Industry

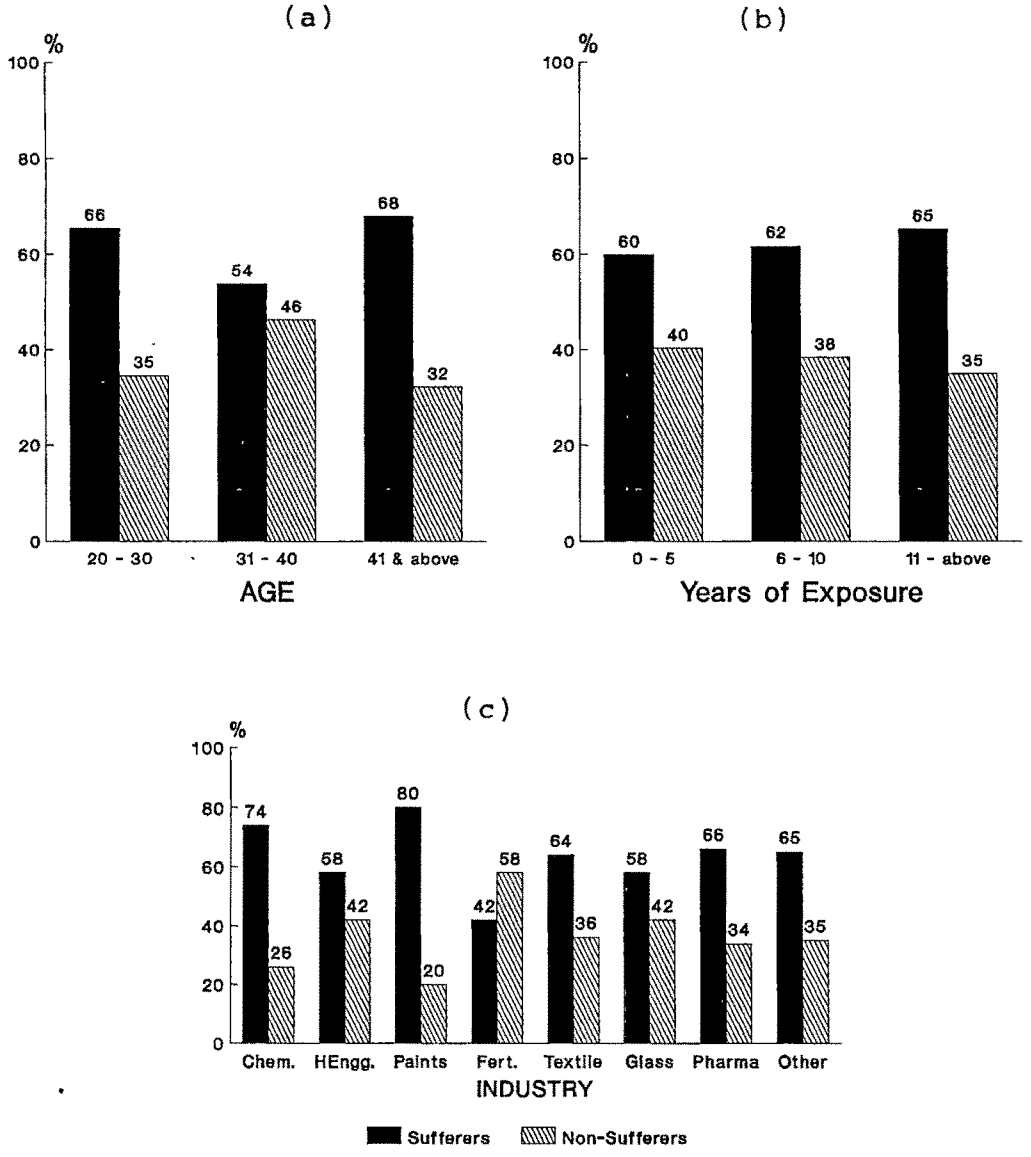

Fig.5.16

TABLE 5.11

Variable Back
By Variable Industry

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	7	26.8896	3.8414	4.5464	.0001
Within Groups	442	373.4562	.8449		
Total	449	400.3458			

Group	Count	Mean	Standard Deviation	Standard Error	Minimum	Maximum	95 Pct Conf Int for Mean
Grp 1	50	2.2440	1.1382	.1610	1.0000	5.0000	1.9205 To 2.5675
Grp 2	50	1.8400	1.1377	.1609	1.0000	5.0000	1.5167 To 2.1633
Grp 3	50	1.5560	.8781	.1242	1.0000	3.3000	1.3064 To 1.8056
Grp 4	50	1.4280	.7513	.1063	1.0000	4.0000	1.2145 To 1.6415
Grp 5	50	1.9460	.7686	.1087	1.0000	3.0000	1.7276 To 2.1644
Grp 6	50	1.8640	1.0075	.1425	1.0000	4.0000	1.5777 To 2.1503
Grp 7	50	1.8600	.7995	.1131	1.0000	4.0000	1.6328 To 2.0872
Grp 8	100	1.5480	.8475	.0848	1.0000	4.0000	1.3798 To 1.7162
Total	450	1.7593	.9443	.0445	1.0000	5.0000	1.6719 To 1.8468

(*) Denotes pairs of groups significantly different at the .050 level

		G r p	G r p	G r p	G r p	G r p	G r p	G r p	G r p
Mean	Group	4	8	3	2	7	6	5	1
1.4280	Grp 4								
1.5480	Grp 8								
1.5560	Grp 3								
1.8400	Grp 2								
1.8600	Grp 7								
1.8640	Grp 6								
1.9460	Grp 5								
2.2440	Grp 1	*	*						

From the above table it is clear that the health variable back and industry shows some association. It is clear that group 1 (Chemical Industry) differs significantly from group 4(i.e. fertilizer) and group 8 (i.e. other industry) at 0.05 level of confidence. The other groups shows no significant difference.

TABLE 5.12

Variable Neck
By Variable Industry

Analysis of Variance

Source	D.F.	Sumn of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	7	15.3423	2.1918	2.6303	.0114
Within Groups	442	368.3106	.8333		
Total	449	383.6529			

Group	Count	Mean	Standard Deviation	Standard Error	Minimum	Maximum	95 Pct Conf Int for Mean
Grp 1	50	1.9340	1.1221	.1587	1.0000	5.0000	1.6151 To 2.2529
Grp 2	50	1.7780	1.1197	.1583	1.0000	3.0000	1.4578 To 2.0942
Grp 3	50	1.3320	.6352	.0898	1.0000	3.0000	1.1515 To 1.5125
Grp 4	50	1.5700	.9509	.1345	1.0000	5.0000	1.2998 To 1.8402
Grp 5	50	1.4200	.6417	.0908	1.0000	3.0000	1.2376 To 1.62024
Grp 6	50	1.7260	1.1234	.1589	1.0000	5.0000	1.4067 To 2.0453
Grp 7	50	1.8160	.8469	.1198	1.0000	4.0000	1.5753 To 2.0567
Grp 8	100	1.5500	.8037	.0804	1.0000	5.0000	1.3905 To 1.7095
Total	450	1.6304	.9244	.0436	1.0000	5.0000	1.5448 To 1.7161

No two groups are significantly different at the .050 level.

Neck problems and type of industry show no association with each other. It means neck problem magnitude is more or less same in all 8 groups of industry. Scheffe procedure shows that no two groups differ at .050 level of confidence.

TABLE 5.13

Variable Shoulder
By Variable Industry

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	7	30.3342	4.3335	3.7011	.0007
Within Groups	442	517.5244	1.1709		
Total	449	547.8586			

Group	Count	Mean	Standard Deviation	Standard Error	Minimum	Maximum	95 Pct Conf Int for Mean
Grp 1	50	1.8720	1.0893	.1540	1.0000	4.2000	1.5624 To 2.1816
Grp 2	50	2.2200	1.0874	.2025	1.0000	5.0000	1.8130 To 2.6270
Grp 3	50	1.5560	1.0874	.1538	1.0000	4.2000	1.2470 To 1.8650
Grp 4	50	1.4640	.9600	.1358	1.0000	5.0000	1.1912 To 1.7368
Grp 5	50	1.4280	.8447	.1195	1.0000	5.0000	1.1879 To 1.6681
Grp 6	50	2.0000	1.3068	.1848	1.0000	4.8000	1.6286 To 2.3714
Grp 7	50	1.7080	.9623	.1361	1.0000	4.2000	1.4345 To 1.9815
Grp 8	100	1.5180	.9628	.0963	1.0000	4.2000	1.3270 To 1.7090
Total	450	1.6982	1.1046	.0521	1.0000	5.0000	1.5959 To 1.8006

No two groups are significantly different at the .050 level.

Shoulder problem and type of industry shows no association with each other. Thus, it can be said that shoulder problem is more or less same in all the eight groups of industries as no group differs significantly at 0.05 level of confidence.

TABLE 5.14

Variable Hands
By Variable Industry

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	7	39.2136	5.6019	4.7986	.0000
Within Groups	442	515.9966	1.1674		
Total	449	555.2102			

Group	Count	Mean	Standard Deviation	Standard Error	Minimum	Maximum	95 Pct Conf Int for Mean
Grp 1	50	2.0360	1.1400	.1612	1.0000	5.0000	1.7120 To 2.3600
Grp 2	50	1.7280	.8981	.1276	1.0000	5.0000	1.4728 To 2.9832
Grp 3	50	1.4600	.9521	.1346	1.0000	4.0000	1.1894 To 1.7306
Grp 4	50	1.3800	.7964	.1126	1.0000	5.0000	1.1537 To 1.6063
Grp 5	50	1.7300	1.0710	.1515	1.0000	5.0000	1.4256 To 2.0344
Grp 6	50	2.4080	1.4784	.2091	1.0000	5.0000	1.9878 To 2.8282
Grp 7	50	1.6960	1.0519	.1488	1.0000	5.0000	1.3971 To 1.9949
Grp 8	100	1.5980	1.1000	.1100	1.0000	5.0000	1.3797 To 1.8163
Total	450	1.7371	1.1120	.0524	1.0000	5.0000	1.6341 To 1.8401

(*) Denotes pairs of groups significantly different at the 0.50 level.

		G r p	G r p	G r p	G r p	G r p	G r p	G r p	G r p
Mean	Group	4	3	8	7	2	5	1	6
1.3800	Grp 4								
1.4600	Grp 3								
1.5980	Grp 8								
1.6960	Grp 7								
1.7280	Grp 2								
1.7300	Grp 5								
2.0360	Grp 1								
2.4080	Grp 6	*		*		*			

The above table shows the association between the problem of hands and various industries. It is seen that group 6 (glass industry) differs significantly from three groups. Group 4(Fertilizers), group 3(Paints) and group 8(other industries) at 0.05 level of confidence. Rest of the groups shows no significant difference.

TABLE 5.15

Variable Lower Limb
By Variable Industry

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	7	52.2924	7.4703	4.7710	.0000
Within Groups	442	692.0764	1.5658		
Total	449	744.3688			

Group	Count	Mean	Standard Deviation	Standard Error	Minimum	Maximum	95 Pct Conf Int for Mean
Grp 1	50	2.4400	1.3933	.1970	1.0000	5.0000	2.0440 To 2.8360
Grp 2	50	1.9680	.9742	.1378	.8000	5.0000	1.6911 To 2.2449
Grp 3	50	2.1360	1.2125	.1715	.8000	5.0000	1.7914 To 2.4806
Grp 4	50	1.6800	.8300	.1174	1.0000	3.4000	1.4441 To 1.9159
Grp 5	50	2.4880	1.4383	.2034	1.0000	5.0000	2.0792 To 2.8968
Grp 6	50	2.9400	1.5168	.2145	1.0000	5.0000	2.5089 To 3.3711
Grp 7	50	2.3560	1.1258	.1592	1.0000	5.0000	2.0361 To 2.6759
Grp 8	100	2.0940	1.3044	.1304	1.0000	5.0000	1.8352 To 2.3528
Total	450	2.2440	1.2876	.0607	.8000	5.0000	2.1247 To 2.3633

(*) Denotes pairs of groups significantly different at the .050 level.

		G r p	G r p	G r p	G r p	G r p	G r p	G r p	G r p
Mean	Group	4	2	8	3	7	1	5	6
1.6800	Grp 4								
1.9680	Grp 2								
2.0940	Grp 8								
2.1360	Grp 3								
2.3560	Grp 7								
2.4400	Grp 1								
2.4880	Grp 5								
2.9400	Grp 6	*	*	*					

Referring to the above table, which shows the association between problem of limbs and industry type, it can be concluded that group 6(glass industry) differs significantly at 0.05 level of confidence from group 4(Fertilizers), groip 2(Heavy Engineering) and group 8 (other industries). Rest of the groups shows no significant difference.

TABLE 5.16

Variable Respiratory Sys.
By Variable Industry

Analysis of Variance

Source	D.F.	Sum of squares	Mean Squares	F Ratio	F Prob.
Between Groups	7	50.6731	7.2390	8.6153	0.0
Within Groups	442	371.3931	.8403		
Total	449	422.0662			

Group	Count	Mean	Standard Deviation	Standard Error	Minimum	Maximum	95 Pct Conf Int for Mean
Grp 1	50	2.0780	.8899	.1259	1.0000	4.1000	1.8251 To 2.3309
Grp 2	50	1.5380	.6574	.0930	1.0000	3.9000	1.3512 To 1.7248
Grp 3	50	1.9620	1.0055	.1422	1.0000	3.9000	1.6762 To 2.2478
Grp 4	50	1.5060	.5575	.0788	1.0000	3.2000	1.3476 To 1.6644
Grp 5	50	2.3240	1.0655	.1507	1.0000	4.6000	2.0212 To 2.6268
Grp 6	50	2.2600	1.1796	.1668	1.0000	4.6000	1.9248 To 2.5952
Grp 7	50	1.6480	.5694	.0805	1.0000	3.2000	1.4862 To 1.8098
Grp 8	100	2.3550	1.0394	.1039	1.0000	4.60000	2.1488 To 2.5612
Total	450	2.0029	.9695	.0457	1.0000	4.6000	1.9131 To 2.0927

(*) Denotes pairs of groups significantly different a the .050 level.

		G r p	G r p	G r p	G r p	G r p	G r p	G r p	G r p
Mean	Group	4	2	7	3	1	6	5	8
1.5060	Grp 4								
1.5380	Grp 2								
1.6480	Grp 7								
1.9620	Grp 3								
2.0780	Grp 1								
2.2600	Grp 6	*	*						
2.3240	Grp 5	*	*						
2.3550	Grp 8	*	*	*					

The above table shows the association between the problem of respiratory system and type of industry. It can be clearly seen that group 6(glass industry) differs significantly from groups 4 and 2 i.e. (Fertilizers and Heavy Engineering industry) at 0.05 level of confidence. The group 5(Textile Industry) differs significantly from group 4(Fertilizers) and group 2(Heavy Engineering) at 0.05 level of confidence. While group 8(other industries) differs significantly at 0.05 level of confidence from group 4, 2 and 7 (i.e Fertilizers, Heavy Engineering and Pharmaceuticals). Rest of the groups shows no significant difference.

TABLE 5.17

Variable Cardiovascular Sys.
By Variable Industry

Analysis of Variance

Source	D.F.	Sum of squares	Mean squares	F Ratio	F Prob.
Between Groups	7	41.7543	5.9649	10.8200	0.0
Within Groups	442	243.6689	.5513		
Total	449	285.4232			

Group	Count	Mean	Standard Deviation	Standard Error	Minimum	Maximum	95 Pct Conf Int for Mean
Grp 1	50	2.0480	.8232	.1164	1.0000	4.3000	1.8141 To 2.2819
Grp 2	50	1.7900	.8011	.1133	1.0000	3.7000	1.5623 To 2.0177
Grp 3	50	1.2920	.5190	.0734	1.0000	2.8000	1.1445 To 1.4395
Grp 4	50	1.5240	.6435	.0910	1.0000	3.7000	1.3411 To 1.7069
Grp 5	50	1.9460	.7983	.1129	1.0000	3.7000	1.7191 To 2.1729
Grp 6	50	2.2920	1.0370	.1467	1.0000	5.0000	1.9973 To 2.5867
Grp 7	50	1.8900	.6707	.0949	1.0000	4.7000	1.6994 To 2.0806
Grp 8	100	1.4930	.6322	.0632	1.0000	3.7000	1.3676 To 1.6184
Total	450	1.7520	.7973	.0376	1.0000	5.0000	1.6781 To 1.8259

(*) Denoates pairs of groups significantly different at the 0.050 level.

		G r p 3	G r p 8	G r p 4	G r p 2	G r p 7	G r p 5	G r p 1	G r p 6
Mean	Group								
1.2920	Grp 3								
1.4930	Grp 8								
1.5240	Grp 4								
1.7900	Grp 2								
1.8900	Grp 7	*							
1.9460	Grp 5	*							
2.0480	Grp 1	*	*						
2.2920	Grp 6	*	*	*					

The above table shows the association between the problem of cardiovascular system and type of industry. It can be seen that there is some association between group 7(Pharmaceutical industry) and group 3 (Paints) as they differ at 0.05 level of confidence. Similarly group 5 (Textiles) differs singificantly from group 3 (Paints) at 0.05 level. Group 1 (Chemical Industry) differs from group 3 (Paints) and group 8 (Other Industries) and also group 6 (glass) differs at 0.05 level of confidence from group 3(Paints), group 8 (Other industry and group 4(Fertilizers). Rest of the groups shows no significant diffcerence at 0.05 level of confidence.

TABLE 5.18

Variable Nervous System
By Variable Industry

Analysis of Avariance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	7	65.5084	9.3583	20.9590	0.0
Within Groups	442	197.3564	.4465		
Total	449	262.8648			

Group	Count	Mean	Standard Deviation	Standard Error	Minimum	Maximum	95 Pct Conf Int for Mean
Grp 1	50	2.0600	.8391	.1187	1.0000	4.2000	1.8215 TO 2.2985
Grp 2	50	1.6280	.8853	.1252	1.0000	5.0000	1.3764 To 1.8796
Grp 3	50	1.4240	.5324	.0753	1.0000	2.6000	1.2727 To 1.5753
Grp 4	50	1.1160	.3548	.0502	1.0000	2.6000	1.0152 To 1.2168
Grp 5	50	2.0280	.6376	.0902	1.0000	3.4000	1.8468 To 2.2092
Grp 6	50	2.3960	.9659	.1366	1.0000	4.2000	2.1215 To 2.6705
Grp 7	50	1.6840	.5285	.0747	1.0000	2.6000	1.5338 To 1.8342
Grp 8	100	1.4100	.5032	.0503	1.0000	3.0000	1.3101 To 1.5099
Total	450	1.6840	.7651	.0361	1.0000	5.0000	1.6131 To 1.7549

(*) Denotes pairs of groups significantly different at the .050 level.

		G r p	G r p	G r p	G r p	G r p	G r p	G r p	G r p
Mean	Group	4	8	3	2	7	5	1	6
1.1160	Grp 4								
1.4100	Grp 8								
1.4240	Grp 3								
1.6280	Grp 2	*							
1.6840	Grp 7	*							
2.0280	Grp 5	*	*	*					
2.0600	Grp 1	*	*	*					
2.3960	Grp 6	*	*	*	*	*			

The above table shows the association between health problem of nervous system and type of industry. It is very clear from the table that groups 2 (Heavy Engineering) and group 7(Paints) both differs significantly at 0.05 level of confidence from group 4(Fertilizer) while both the groups 5 (Textile Industry) and group 1(Chemical Industry) differs from groups 4(Fertilizers), group 8(Other industries) and group 3(Pint Industry) at 0.05 level of confidence. It is also seen that group 6 (Glass industry) differs significnatly at 0.05 level of confidence from groups 4, 8, 3, 2 and 7 i.e. fertilizer, other industries, paints, heavy engineering and Pharmaceuticals respectively.

TABLE 5.19

Variable Gastro Intestinal System
By Variable Industry

Analysis of Variance

Source	D.F.	Sum of squares	Mean squares	F Ratio	F Prob.
Between groups	7	11.2138	1.6020	3.9687	.0003
Within Groups	442	178.4138	.4037		
Total	449	189.6276			

Group	Count	Mean	Standard Deviation	Standard Error	Minimum	Maximum	95 Pct Conf Int for Mean
Grp 1	50	1.8020	.7263	.1027	1.0000	3.6000	1.5956 To 2.0084
Grp 2	50	1.5800	.4620	.0653	1.0000	2.9000	1.4487 To 1.7113
Grp 3	50	1.2860	.6334	.0896	1.0000	3.4000	1.1060 To 1.4660
Grp 4	50	1.4920	.6552	.0927	1.0000	4.2000	1.3058 To 1.6782
Grp 5	50	1.6280	.6547	.0926	1.0000	3.2000	1.4419 To 1.8141
Grp 6	50	1.8020	.7953	.1125	1.0000	3.7000	1.5760 To 2.0280
Grp 7	50	1.7080	.5536	.0783	1.0000	3.2000	1.5507 To 1.8653
Grp 8	100	1.4980	.5895	.0589	1.0000	3.0000	1.3810 To 1.6150
Total	450	1.5882	.6499	.0306	1.0000	4.2000	1.5280 To 1.6484

(*) Denotes pairs of groups significantly different at the.050 level.

		G r p 3	G r p 4	G r p 8	G r p 2	G r p 5	G r p 7	G r p 6	G r p 1
Mean	Group								
1.2860	Grp 3								
1.4920	Grp 4								
1.4980	Grp 8								
1.5800	Grp 2								
1.6280	Grp 5								
1.7080	Grp 7								
1.8020	Grp 6	*							
1.8020	Grp 1	*							

Referring to the above table, which shows the association between gastrointestinal system problem and type of industry. It is clear that group 6 (glass industry) and group 1(Chemical industry) shows significant difference at 0.05 level of confidence from group 3(Fertilizer). Rest of the groups shows no significant difference.

TABLE 5.20

Variable Eyes
By Variable Industry

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	7	122.4353	17.4908	13.4925	0.0
Within Groups	442	572.9793	1.2963		
Total	449	695.4146			

Group	Count	Mean	Standard Deviation	Standard Error	Minimum	Maximum	95 Pct Conf Int for Mean
Grp 1	50	3.6040	.7211	.1020	1.0000	4.7000	3.3991 To 3.8089
Grp 2	50	2.1100	.9886	.1398	1.0000	4.3000	1.8291 To 2.3909
Grp 3	50	3.0160	1.3449	.1902	1.0000	5.0000	2.6338 To 3.3982
Grp 4	50	1.9280	1.1980	.1694	1.0000	5.0000	1.5875 To 2.2685
Grp 5	50	2.3240	1.1202	.1584	1.0000	4.3000	2.0056 To 2.6424
Grp 6	50	2.9500	1.2653	.1789	1.0000	4.8000	2.5904 To 3.3096
Grp 7	50	2.0780	1.0318	.1459	1.0000	5.0000	1.7848 To 2.3712
Grp 8	100	2.3070	1.2250	.1225	1.0000	5.0000	2.0639 To 2.5501
Total	450	2.5138	1.2445	.0587	1.0000	5.0000	2.3985 To 2.6291

(*) Denotes pairs of groups significantly different at the .050 level.

		G r p	G r p	G r p	G r p	G r p	G r p	G r p	G r p
Mean	Group	4	7	2	8	5	6	3	1
1.9280	Grp 4								
2.0780	Grp 7								
2.1100	Grp 2								
2.3070	Grp 8								
2.3240	Grp 5								
2.9500	Grp 6	*	*						
3.0160	Grp 3	*	*	*					
3.6040	Grp 1	*	*	*	*	*			

The above table refers to the eye problem and groups of industries. It is seen that group 6 (glass industry) differs significantly from groups 4 and 7 (i.e. Fertilizers and Pharmaceuticals) at 0.05 level of confidence. It also shows that group 3(Paints) differs at 0.05 level from group 4, 7 and 2 (i.e. Fertilizers, Pharmaceuticals and Heavy Engineering). Similarly group 1 (Chemical Industry) differs from groups 4, 7, 2, 8 and 5 (Fertilizers, Pharmaceuticals, heavy Engineering, other industries and Textile Industry respectively) at 0.05 level of confidence. Rest of the groups show no significant difference.

TABLE 5.21

Variable Ears
By variable Industry

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prof.
Between Groups	7	47.5404	6.7918	11.3722	0.0
Within Groups	442	263.9638	.5972		
Total	449	311.5042			

Group	Count	Mean	Standard Deviation	Standard Error	Minimum	Maximum	95 Pct Conf Int for Mean
Grp 1	50	1.4080	.7510	.1062	1.0000	4.3000	1.1946 To 1.6214
Grp 2	50	2.1180	.7286	.1030	1.0000	3.7000	1.9109 To 2.32 51
Grp 3	50	1.9400	1.1555	.1634	1.0000	4.3000	1.6116 To 2.2684
Grp 4	50	1.2900	.5207	.0736	1.0000	3.0000	1.1420 To 1.4380
Grp 5	50	1.2640	.5337	.0755	1.0000	3.3000	1.1123 To 1.4157
Grp 6	50	1.8740	1.0279	.1454	1.0000	3.7000	1.5819 To 2.1661
Grp 7	50	1.8080	.8741	.1236	1.0000	3.7000	1.5596 To 2.0564
Grp 8	100	1.2800	.5360	.0536	1.0000	3.3000	1.1737 To 1.3863
Total	450	1.5847	.8329	.0393	1.0000	4.3000	1.5075 To 1.6618

(*) Denotes pairs of groups significantly different at the .050 level.

Mean	Group	Grp 5	Grp 8	Grp 4	Grp 1	Grp 7	Grp 6	Grp 3	Grp 2
1.2640	Grp 5								
1.2800	Grp 8								
1.2900	Grp 4								
1.4080	Grp 1								
1.8080	Grp 7		*						
1.8740	Grp 6	*	*	*					
1.9400	Grp 3	*	*	*					
2.1180	Grp 2	*	*	*	*				

The above table shows the relation between ear problem and various groups of industries. It is thus clear that group 7(Paints) differs at 0.05 level of confidence from group 8(other industries). It is also clear that both the groups, 6(glass industry) and group 3(paints) differ from group 5 (Textile industry), group 8 (other industries) and group 4(Fertilizers) at 0.05 level of confidence. While group 2(Heavy Engineering) differs from groups 5, 3, 4, 1 (Textile, other industries, Fertilizers and Chemical Industry) at 0.05 level of confidence. Rest of the groups shows no significant difference.

TABLE 5.22

Variable Skin
By Variable Industry

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	7	100.6875	14.3839	16.0364	0.0
Within Groups	442	396.7007	.8975		
Total	449	497.3882			

Group	Count	Mean	Standard Deviation	Standard Error	Minimum	Maximum	95 Pct Conf Int for Mean
Grp 1	50	2.8460	1.2273	.1736	1.0000	5.0000	2.4792 To 3.1948
Grp 2	50	1.3620	1.0099	.1428	1.0000	5.0000	1.0750 To 1.6490
Grp 3	50	2.0960	1.1310	.1599	1.0000	4.0000	1.7746 To 2.4174
Grp 4	50	1.4220	.6825	.0965	1.0000	3.0000	1.2280 To 1.6160
Grp 5	50	1.2420	.6640	.0939	1.0000	4.0000	1.0533 To 1.4307
Grp 6	50	1.6540	1.0712	.1515	1.0000	4.0000	1.3496 To 1.9854
Grp 7	50	1.7780	.7229	.1022	1.0000	3.3000	1.5726 To 1.9834
Grp 8	100	1.4410	.9210	.0921	1.0000	5.0000	1.2582 To 1.6238
Total	450	1.6980	1.0525	.0496	1.0000	5.0000	1.6005 To 1.7955

(*) Denotes pairs of groups significantly different at the .050 level.

Mean	Group	Grp 5	Grp 2	Grp 4	Grp 8	Grp 6	Grp 7	Grp 3	Grp 1
1.2420	Grp 5								
1.3620	Grp 2								
1.4220	Grp 4								
1.4410	Grp 8								
1.6540	Grp 6								
1.7780	Grp 7								
2.0960	Grp 3	*	*		*				
2.8460	Grp 1	*	*	*	*	*	*	*	

The above table mentions association between the skin problem and group of industries. It can be concluded refering to the table that group 3(Paint Industry) differs significantly from groups 5, 2, and 8 (Textile, Heavy Engineering and other industries) at 0.05 level of confidence. The group No.1 (Chemical Industry) differs at 0.05 level of confidence from group 5, 2, 4, 8, 6, 7, 3 (Textile Heavy Engineering, Fertilizers, Others, glass, Pharmaceuticals and Paint Industries). Rest of the groups shows no significant difference.

TABLE 5.23

Variable Nose
By Variable Industry

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	7	50.4127	7.2018	7.9825	0.0
Within Groups	442	398.7712	.9022		
Total	449	449.1839			

Group	Count	Mean	Standard Deviation	Standard Error	Minimum	Maximum	95 Pct Conf Int for Mean
Grp 1	50	2.8920	1.1175	.1580	1.0000	5.0000	2.5744 To 3.2096
Grp 2	50	2.0020	.6781	.0959	1.0000	3.5000	1.8093 To 2.1947
Grp 3	50	1.9640	1.0671	.1509	1.0000	4.8000	1.6607 To 2.2673
Grp 4	50	1.7320	.8462	.1197	1.0000	5.0000	1.4915 To 1.9725
Grp 5	50	2.2500	1.0164	.1437	1.0000	5.0000	1.9611 To 2.5389
Grp 6	50	2.5000	1.0302	.1457	1.0000	4.0000	2.2072 To 2.7928
Grp 7	50	1.8440	.8671	.1226	1.0000	5.0000	1.5976 To 2.0904
Grp 8	100	2.1260	.9249	.0472	1.0000	5.0000	1.9425 To 2.3095
Total	450	2.1596	1.0002	.0472	1.0000	5.0000	2.0669 To 2.2522

(*) Denotes pairs of groups significantly different at the 0.050 level.

		G r p	G r p	G r p	G r p	G r p	G r p	G r p	G r p
Mean	Group	4	7	3	2	8	5	6	1
1.7320	Grp 4								
1.8440	Grp 7								
1.9640	Grp 3								
2.0020	Grp 2								
2.1260	Grp 8								
2.2500	Grp 5								
2.5000	Grp 6	*							
2.8920	Grp 1	*	*	*	*	*			

The above table shows association between problem of nose and various groups of industries. It is seen that group 6(glass industry) differs at 0.05 level of confidence from group 4(Fertilizers) and also it is clear that group 1 (Chemical Industry) differs significantly at 0.05 level of confidence from group 4 (Fertilizers), group 7 (Pharmaceuticals), group 3(Paints), group 2 (Heavy Engineering) and group 8(Other industries). Rest of the groups shows no significant difference.

TABLE 5.24

Variable Sleep
By Variable Industry

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	7	57.8517	8.2643	9.8357	0.0
Within Groups	442	371.3949	.8403		
Total	449	429.2466			

Group	Count	Mean	Standard Deviation	Standard Error	Minimum	Maximum	95 Pct Conf Int for Mean
Grp 1	50	2.7060	.8128	.1149	1.0000	4.0000	2.4750 To 2.9370
Grp 2	50	2.6380	1.3334	.1886	1.0000	5.0000	2.2591 To 3.0169
Grp 3	50	2.2260	.8161	.1154	1.0000	4.0000	1.9941 To 2.4579
Grp 4	50	1.9020	.8577	.1213	1.0000	4.0000	1.6582 To 2.1458
Grp 5	50	3.1520	.8890	.1257	1.0000	4.8000	2.8994 To 3.4046
Grp 6	50	2.8880	.9057	.1281	1.0000	4.3000	2.6306 To 3.1454
Grp 7	50	2.6660	.8429	.1192	1.0000	5.0000	2.4265 To 2.9055
Grp 8	100	2.3130	.8378	.0838	1.0000	5.0000	2.1468 To 2.4792
Total	450	2.5338	.9778	.0461	1.0000	5.0000	2.4432 To 2.6244

(*) Denotes pairs of groups significantly different at the .050 level.

		G r p	G r p	G r p	G r p	G r p	G r p	G r p	G r p
Mean	Group	4	3	8	2	7	1	6	5
1.9020	Grp 4								
2.2260	Grp 3								
2.3130	Grp 8								
2.6380	Grp 2	*							
2.6660	Grp 7	*							
2.7060	Grp 1	*							
2.8880	Grp 6	*							
3.1520	Grp 5	*	*	*					

The above table shows the association between disturbed sleep and various groups of industries. It is seen that all the three groups 2, 7 and 1 (Heavy Engineering, Pharmaceuticals and glass industries) differ significantly at 0.05 level of confidence from group 4 (Fertilizers). In the same way group 5(Textile Industry) differs significantly at 0.05 level of confidence from group 4 (Fertilizers) group 3(Paints) and group 8(other industries). Rest of the groups shows no significant difference.

TABLE 5.25

Variable Asthama
By Variable Industry

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	7	79.7923	11.3989	9.7830	0.0
Within Groups	442	515.0060	1.1652		
Total	449	594.7983			

Group	Count	Mean	Standard Deviation	Standard Error	Minimum	Maximum	95 Pct Conf Int for Mean
Grp 1	50	2.1360	1.1797	.1668	1.0000	5.0000	1.8007 To 2.4713
Grp 2	50	1.2760	.5798	.0820	1.0000	3.4000	1.1112 To 1.4408
Grp 3	50	1.4200	.6679	.0945	1.0000	2.6000	1.2302 To 1.6098
Grp 4	50	1.1720	.4081	.0577	1.0000	2.6000	1.0560 To 1.2880
Grp 5	50	2.1520	1.6848	.2383	1.0000	5.0000	1.6732 To 2.6308
Grp 6	50	2.4160	1.8904	.2673	1.0000	5.0000	1.8788 To 2.9532
Grp 7	50	1.6360	.5823	.0824	1.0000	2.8000	1.4705 To 1.8015
Grp 8	100	1.4220	.8379	.0838	1.0000	4.2000	1.2557 To 1.5883
Total	450	1.6724	1.1510	.0543	1.0000	5.0000	1.5658 To 2.7791

(*) Denotes pairs of groups significantly different at the 0.050 level.

		G r p	G r p	G r p	G r p	G r p	G r p	G r p	G r p
Mean	Group	4	2	3	8	7	1	5	6
1.1720	Grp 4								
1.2760	Grp 2								
1.4200	Grp 3								
1.4220	Grp 8								
1.6360	Grp 7								
2.1360	Grp 1	*	*		*				
2.1520	Grp 5	*	*		*				
2.4160	Grp 6	*	*	*	*				

The above table shows association between health problem of asthma and the various groups of industries. The table shows that groups 1 and 5 (Chemical and Textile Industry) differ significantly at 0.05 level from groups 4, 2, 3 and 8 (Fertilizer, Heavy Engineering, Paints and Other Industries). Rest of the groups are not significantly different.

TABLE 5.26

Variable Stress
By Variable Industry

Analysis of Variance

Source	D.F.	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	7	27.2815	3.8974	4.0169	.0003
Within Groups	442	428.8507	.9703		
Total	449	456.1322			

Group	Count	Mean	Standard Deviation	Standard Error	Minimum	Maximum	95 Pct Conf Int for Mean
Grp 1	50	3.0940	1.0346	.1463	1.0000	5.0000	2.8000 To 3.3880
Grp 2	50	2.7600	.9442	.1335	1.0000	4.8000	2.4917 To 3.0283
Grp 3	50	3.2740	1.1328	.1602	1.0000	5.0000	2.9521 To 3.5959
Grp 4	50	2.3520	1.0890	.1540	1.0000	4.3000	2.0425 To 2.6615
Grp 5	50	2.9700	.8858	.1253	1.3000	4.7000	2.7183 To 3.2217
Grp 6	50	2.7280	.9918	.1403	1.0000	5.0000	2.4461 To 3.0099
Grp 7	50	2.9580	.9424	.1333	1.0000	5.0000	2.6902 To 3.2258
Grp 8	100	2.7810	.9077	.0908	1.0000	4.7000	2.6009 To 2.9611
Total	450	2.8553	1.0079	.0475	1.0000	5.0000	2.7620 To 2.9487

(*) Denotes pairs of groups significantly different at the .050 level.

		G r p	G r p	G r p	G r p	G r p	G r p	G r p	G r p
Mean	Group	4	6	2	8	7	5	1	3
2.3520	Grp 4								
2.7280	Grp 6								
2.7600	Grp 2								
2.7810	Grp 8								
2.9580	Grp 7								
2.9700	Grp 5								
3.0940	Grp 1								
3.2740	Grp 3	*							

The above table shows association between stress and various industry groups. It is clear that group 3(paints) differs significantly at 0.05 level of confidence from group 4(fertilizer). Rest of the groups shows no significant difference.