A study of factors associated with sickness absenteeism among industrial workers in Karnataka

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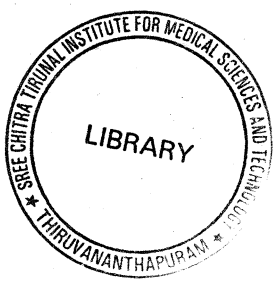
Dissertation submitted in partial fulfillment of the requirement for the award of the degree of Master of Public health



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Declaration

I hereby certify that the dissertation entitled, "A study of factors associated with sickness absenteeism among industrial workers in Karnataka" is the result of original research and has not been submitted for any degree in any other university or institution.

October, 2007 Dr Manjunatha R

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Dr. Manjunatha R

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Certificate

This is to certify that the dissertation entitled, "A study of factors associated with sickness absenteeism among industrial workers in Karnataka" submitted by Dr Manjunatha R to Achutha Menon Centre for Health Science Studies, Sree Chitra Tirunal Institute for Medical Sciences & Technology Thiruvananthapuram, Kerala (India), is a bonafide work carried out by him.

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Table of contents

Abstract

Background: Study of illnesses causing absence of workers from work in industries is a practical method to obtain health status of industrial workers and to identify occupational health hazards. Sickness absenteeism is related to social, economic and health related factors. Because of economic and public health implications, study of sickness absences is important in setting up of priorities in occupational health services and labour welfare policies. Since data on sickness absenteeism in the state of Karnataka is limited this study was undertaken.

Objective: To estimate the prevalence of sickness absenteeism and to study the factors associated with sickness absenteeism among industrial workers in a public sector industry in Karnataka

Methodology: From a total of 2525 permanent workers, 353 (mean age 55.1 yrs, male 69.4%) were selected using stratified random sampling. Information on socio-demographic variables, sickness, alcohol use, tobacco use, type of work, working pattern, relationship with superiors and physical work environment was collected using a structured pre-tested interview schedule. Multiple logistic regression and linear regression analyses were done using SPSS. A p value of < 0.05 was considered for statistical significance.

Results: The overall proportion of sickness absenteeism was 66.9% (95% CI: 0.62 – 0.71). In binary logistic regression analysis, workers from a low socio-economic status had 1.97 higher odds of sickness absenteeism (95% CI: 0.98- 3.93) compared to workers from high socio-economic status, ever users of alcohol had a 2.5 times higher odds of sickness absenteeism (95% CI: 1.20- 4.98) compared to life time abstainers, and workers who had better relations with their supervisors at work place were less likely to have sickness absenteeism with odds of 0.78 (CI: 0.63 - 0.93) compared to their counterparts.

Overall 16.4 days were lost per worker per year (male = 16.5 & female = 16.2) due to sickness absence. A blue collar worker lost 21.5 days compared to 11.9 days by a white collar worker ($p < 001$). In multiple linear regression with number of days lost due to sickness absenteeism as outcome variable, level of education ($p=0.006$), ever use of alcohol ($p=0.05$), poor relations with superiors ($p <0.001$) and shift work ($p=0.028$) were significantly associated.

Among the workers 81% had some sickness in the last one year. Among health ailments musculoskeletal problems (31.4%), gastrointestinal problems (25.8%), hypertension (24.4%), respiratory problems (18.1%) and other minor ailments (19.3%) were found to be high.

Conclusions: Sickness absenteeism among the workers was high compared to published data from other parts of India. Efforts should be made to reduce alcohol consumption, and improve the relationships with supervisory workers in order to reduce the sickness absenteeism.

Chapter 1

Introduction and background information

1. 1. Introduction:

Study of illnesses causing absence of workers from work in industries is a practical method to obtain health status of industrial workers and to identify occupational health hazards.[1] Absenteeism is an important factor determining the productivity of a given industry, and it depends upon worker's health, and also on other factors including personal and socioeconomic conditions of workers.[2] Recorded sickness absences accurately reflect the health of working populations, when health is understood in terms of physical and social functioning. [3]

1.2. Background:

Absenteeism is 'lack of physical presence when there is a social expectation to be there', it can be of two types - innocent absenteeism and culpable absenteeism.[4] Absenteeism due to reasons of sickness is considered as innocent absenteeism. Researchers have used sickness absence records as important indicator of health among working populations.[5]

1.2.1. Definitions of sickness absenteeism:

Sickness absenteeism is described as an 'emerging important epidemiological health issue' since it has economic and public health implications.[6] It increases the cost of medical care and social security, causes less labour force available for work, which results in increasing economic burden and deleterious negative effects on the national economies.[6]

Sickness absenteeism is also defined as 'temporary, extended or permanent incapacity for work as a result of sickness or infirmity.' [7]

S C Whitaker describes sickness absence as a 'complex phenomenon that is influenced strongly by factors other than health'. [8] M Kivimaki et al reports that good sick pay schemes, using leaves to take rest and spending time to support family members influences taking sick leave, and they describe that a worker may take sick leave without being ill and may have illness but without taking a sickness leave.[9]

1.2.2. Implications of sickness absenteeism:

Absenteeism is taken as one of the important factors to assess various labour welfare programs and policies.[10] Sickness absence data is a tool for the occupational health services to set priorities for prevention measures and evaluation of the existing methods.[6]

Identifying and addressing the factors related to sickness absence helps to prevent loss of manpower and resources, and increases the productivity of industries.[7]

Chapter 2

Review of Literature

2.1. Global scenario:

Since different methods are followed in different countries to measure sickness absence, the comparison between countries has limitations. The European foundation under Grundemann RWM investigated the sickness absence within the European Union and did not publish the comparison of absence rates between countries, [7] because some countries included maternity benefits and permanent disability benefits under sickness absence and some countries did not. Disparity was observed for including public sector or self-employed groups of workers data on sickness absence for national level figures between countries.[8]

Studies on sickness absenteeism by Boston Edison dates back to 1913, maintaining medical records of one day and longer absences were seen, and analysis of such records by Sappington (1918-22) and Gafafer (1938-41 and 1944-47) are seen.[1] And identifying the dental illnesses as major causes for absenteeism among tennessee plant workers by them from these records is an example of usefulness of study on sickness absence records.[1]

A study among 15 European Union member countries by D Gimeno et al showed that the proportion of sickness absence over 12 months duration was 14.5 percent, which varied between 6.7 percent and 24 percent. [11] Another study among Finnish employed workforce by Kauppinen T et al identified 45 percent of sickness absence. But in this study they have studied the sickness absence proportion over last 6 months duration. [12]

In Whitehall II study, on 10,000 British civil servants, it was reported that 57 percent of the men and 76 percent of the women had atleast one sickness absence over one year prior to the

study entry. [9] A study among 10 towns of Finland by J Vahtera et al, reported that 58 percent of the participated municipal employees had atleast one sickness absence in one year.[13] When they calculated in terms of absence days lost per year, it was 11.6 absence days per year among men and 13.9 absence days per year among women.[13] But another study among eight European countries and Canada showed overall sickness absence rate as 3.21 percent when overtime was excluded and they calculated absence rate as the ratio of number of hours reported absence due to illness in the reference week to contracted hours.[14]

Y Morikawa et al from their study on sickness absence in a Japanese cohort and a British cohort had reported that the variation in the social security and labour policies of different countries, influences difference in sickness absences in respective countries.[15]

2.2. Indian Scenario:

A study by A K Dutta and Sharma in 1978 in India, estimated that the proportion of workers who had sickness absenteeism in the past 12 months to be 59.73 percent. By sex, 85.42 percent of females and 55.59 percent of males had atleast one sickness absence, with average loss of 19.80 days per worker per year.[16] This was similar to the proportion reported by Gandhi and co-workers in 1971, in their study on cotton mill workers from Kanpur.[16]

A study by M Lal and J Biswas on group D employees of a hospital from Amritsar showed that 59.2 percent of the employees have availed their medical leave.[2] In this study the duration was taken from 1999 to their date of survey, which was done in 2002.

A study among coal workers from Bihar has shown that 55.5 percent of the workers had sickness absenteeism during one-year period; 53 percent of male and 70 percent of female workers had sickness absenteeism.[17] This study also has showed that rotational shift workers

had more absenteeism than general shift workers. Another important finding from this study was that most of the morbidities for which the absenteeism was found were preventable in nature.[17]

2.3. Predictors of Sickness absenteeism:

2.3.1. Individual factors

A. Age:

A study by Das Pratima et al from Bihar had reported higher proportions of sickness absenteeism among older workers.[17] Studies by A K Dutta and Sharma had shown that as the age increases the duration of sickness absence increases.[16] With aging, workplace perceptions, attitude towards work and sense of age discrimination at workplace affects the efficiency of workers and it influences sickness absenteeism among workers.[18]

B. Sex:

Studies have found that female workers experiences higher sickness absenteeism than male workers.[16, 17] Study of workers sickness absences, for duration of one year prior to study entry in Whitehall-II study, also reported that female workers had higher proportion of sickness absenteeism than male workers.[9] A study by M Borritz et al, among Danish human service workers reported that, sex is one of the predictors of absenteeism, and being a woman increases the risk of having high absenteeism.[19]

Costa G from Italy had reported that female workers are more vulnerable as they have more family duties and reproductive functions.[20]

C. Educational status:

Studies have reported that educational status of workers has influence on the sickness absence. A K Dutta and Sharma reported that workers who had lower level of education take more sickness absence than workers with higher levels of education; both in number of times of absence and duration of absence.[16, 17, 21] similar results were reported by studies of K D Gupta et al and Das pratima et al

D. Duration of Employment:

Studies have found that the duration of employment is a predictor of sickness absenteeism. Das pratima et al reported that as the duration of service increases the sickness absenteeism also increases.[17] Xu Z et al reported that as the duration of employment increases the risk for occupational diseases also increases. [22]

K D Gupta et al in their study on repeated sickness absences in a ship repairing organization reported that among workers who have more length of service had more sickness absences compared with workers who have less length of service.[21]

E. Marital status and family:

K D Gupta et al have found that married workers who are not staying with the family are found to take more sickness absences compared to unmarried and married staying with the family.[21] Some studies have reported that the single workers and workers who are divorced or separated take more sickness absences.[23, 24]

Maria Mechior et al from their French GAZEL study reported that increasing family demands, and having more number of dependents in the household increases the sickness absences both among men and women.[25] But K D Gupta et al reported that the rate of sickness absenteeism decrease with increase in the number of dependents on the worker.[21]

Increasing social responsibility causes increasing demands and workers tend to attend work even during illness is the possible explanation provided by them.

A good family support, creates a good psychosocial support for a worker, and the family support, helps to maintain health and results in less sickness absences.[26]

F. Distance of residence from workplace:

A study by M Lal and J Biswas, on group D employees of a hospital from Amritsar, has reported that the workers who stay far away from their workplaces take more sick leaves than their counterparts.[2] Giovanni costal et al from Europe reported that commuting for the working people causes adverse effects. It affects by delaying waiting time in public transports, thereby increases strain, increasing work stress, reduction in the time available for rest and sleep, and manifests as psychosocial problems with work and family members for the workers. Its adverse effects are more pronounced if the worker is working at more strenuous job and shift works.[27]

G. Socio-economic conditions:

Eyal A et al from Israel reported that various socio-economic factors determine absence of workers, than occupational risks or health related problems.[28] A K Dutta and R Sharma reported that the workers having lower income levels take more sick leaves than other workers.[16] M Borritz et al, also reported that, low socioeconomic status is one of the predictors of absenteeism.[19]

H. Health Conditions:

Two-way interaction: There is always a two-way interaction between person, physical and the psychological work environment.[29] Unhealthy physical and psychosocial working

environment, affects the health of the workers resulting in high sickness absence among workers. [29]

Analysis of United States public health records by Sappington (1918-22) and Gafafer (1938-41 and 1944-47) identified dental illnesses as major causes for absenteeism among tennessee plant workers.[1]A study by E C Alexopoulos and A Burdorf has concluded that blue collar workers suffer from respiratory problems more than office workers and these workers are more prone for subsequent absenteeism due to health problems.[30] Costa G reported a higher risk for gastrointestinal, psychoneurotic, and cardiovascular diseases, among shift workers than regular day workers.[20]

In a study on sickness absence and diabetic employees, by A Skerjanc, it was found that diabetic employees were absent more often and for longer duration than non-diabetic employees and the diabetic people had impairments, causing disability to work to normal standards than non diabetic employees.[31] In a study among industrial workers and construction workers by W J Meerding et al on presenteeism with sickness, it was found out that there was a mean loss of two hours per worker due to reduced productivity. The reduced productivity was associated with musculoskeletal complaints, worse physical, mental and general health, of the workers.[32]

A Study by Eyal A et al from Israel suggested that short-term leaves are more related with intercurrent illnesses and long-term leaves were related with major illnesses.[28]

I. Tobacco use:

Both smoking and smokeless tobacco use are associated with health problems [33]; Tobacco use is a major risk factor for many non-communicable diseases, mainly for respiratory, cardiovascular health problems, and cancer.[33]

J L Sindelar et al have reported that smoking causes increase in absence from work, by increasing health problems, mainly respiratory, circulatory, and cancer.[34] A study on smoking and sickness absence by T Lana et al had identified that smoking is associated with higher risk of sickness absence from work.[35] M Borritz et al, reported, that use of tobacco, is one of the predictors of absenteeism.[19]

J. Alcohol Use:

Increased risk for sickness absence due to alcohol cosumption was reported in several studies. Jussi Vahtera et al have reported a U-shaped relation between alcohol intake and medically certified sickness absence for men and women. In their study it was found that never, former, and heavy drinkers had higher rates of sickness absence compared with light drinkers. [36] Marmot MG et al from the Whitehall-II study have reported that alcohol consumption was related to employment grade. They also have reported a U – shaped relation among men for the relation of alcohol intake to short spells of sickness absence (less-than-or-equal-to 7 days), and they have identified an increase in long spells (> 7 days) of absence in frequent drinkers. But they have not found any relation of alcohol use and sickness absence among women, except the finding that higher rates of sickness absence was found in non-drinkers.[37] Marianne Upmark et al observed a higher risk among alcohol consumers for disability pensions than others. And they found a higher risk for absenteeism

among abstainers than moderate and low consumers of alcohol.[38] According to a WHO report in 2004, 15-20 percent of absenteeism and 40 percent of accidents at work are related to alcohol consumption.[39]

2.3.2. Occupational factors:

A. Blue Collar Work:

Blue collar workers who work at manufacturing and production sites experience more health problems than white collar workers and sickness absenteeism is more among them. A study by E C Alexopoulos and Burdorf A has concluded that blue collar workers suffer from more respiratory problems than office workers and they were more prone for subsequent absenteeism due to health problems.[30] In a study by T Morken et al a higher risk was observed for sickness absence among blue-collar workers than white-collar workers.[40] Eyal A et al have reported that blue collar workers take more sick leave than white-collar workers. [28] W.J. Meerding et al have reported that musculoskeletal disorders risk is more among blue collar workers, which leads to higher sickness absenteeism among them compared to white collar workers.[32]

B. Shift Work:

Individuals who work in shift work are widely reported to suffer more health problems than regular day workers.[17] This is because shift work, causes disturbances in the biological rhythm, social and family life that can negatively affect performance efficiency, health, and social relations and can result in ill effects on health and social life.[20]

Knuttson has reported that disturbances in the circadian rhythm cause variation in the dose-response relationships of drugs and sleep deprivation causes modifications in the medical disorders like asthma, diabetes and epileptic attacks. [41]

Knuttson and Boggild describe smoking and unhealthy food habits as 'main shift related behavioral effects', due to disturbances in the social life and biological rhythm. Also they have reported that shift workers are at higher risk of cardiovascular diseases than regular day workers.[42]

C. Physical work environment characteristics:

Heat:

Most common physical hazard at workplaces is heat. Foundries having oven and furnaces, particularly in steel manufacturing industries, heat stagnation, heat exhaustion, heat stroke, cramps, are the ill effects due to workplace heat.[43] It affects health, and reduces efficiency and influences sickness absenteeism. Heat fatigue is one of the main causes for workplace injuries.[44] It affects the concentration on work and increases workplace irritability of the workers, leading to workplace accidents. Exposure to excessive brightness or glare at workplace is associated with discomfort and visual fatigue. In steel industries heat associated with excessive brightness and glare, can lead to visual fatigue, blurring of vision and lead to accidents.[44]

Noise:

A study from Israel by Melamed S et al has identified higher risk of accidents and sickness among people who work at higher noisy environment. This study also reports that among males, noise exposure level affected job dissatisfaction and post-work irritability, and among females noise exposure increased somatic complaints, anxiety and depression.[45] A study by

van Dijk FJ et al on non-auditory effects of noise suggested that noise exposure together with stressful mental activities leads to disturbed concentration, irritation and annoyance among workers. [46]

Vibrations:

Working for long time with works involving vibrations exposure, affects the fine blood vessels of the fingers, increases sensitive to spasm (white fingers). Injuries of the joints, of the hands, elbows and shoulders, are more seen among workers who are involved in work having high vibrations.[44]

Dust:

Dusts are finely divided solid particles with size ranging from 0.1 to 150 microns. They are released into the atmosphere during crushing, grinding, abrading, loading and unloading operations. Particle smaller than 5 microns size is directly inhaled into the lungs and will be retained there. This fraction of the dust is called "respirable dust", and is mainly responsible for pneumoconiosis. Working for long durations at workplaces involving dust causes increased risk for respiratory problems.[44]

The physical factors play a major role in adding to or precipitating psychosocial and psychosomatic problems among workers. Aggressiveness, anxiety, depression, alcoholism, drug abuse, etc manifest as a result of excessive mental and physical stress for a long duration. [44]

D. Workplace injuries:

A study by Ruta U and Loreta P from Lithuania has reported that 9.3 percent of the sickness absence among workers is due to injuries and accidents.[47]A study by Dembe et al reported that working at non standard schedule increases the risk for workplace injuries, and the risk is more among those who experiences being fired and working at shifts.[48] Hoivik D et al reported that management style and trust in the superiors at the workspot are important factors for predicting personal injuries.[49] A WHO report of 2004, reports that 40 percent of the workplace accidents are related to alcohol consumption. [39]

E. Psychosocial Conditions at Workplace:

Study by Thomas Lund from Denmark has shown that the long term absence risk among both men and women is increased by exposure to uncomfortable work positions and physically heavy work and the effects increased with co-exposure to certain psychosocial conditions of the workers.[50] M Vezina et al in their paper on workplace prevention and promotion strategies have described that a work should remain human and the production ethics has to respect the 'psychological integrity' of individual workers.[51] Therefore any factors which can benefit the organization and employee has to be studied in order to establish a healthy working atmosphere at workplace. A study by T L Dremsa et al on absenteeism among care seeking Gulf war veterans, reported that psychological conditions were important predictors for absenteeism.[52]

Study by T Lund et al, suggested that among male employees demands for hiding emotions and high emotional demands increases the risk for long term sickness absence whereas work role conflict, low reward and working with poor management increases risk for long term absence for women.[53]

2.3.3. Organizational factors:

A. Work Place Relations:

Work place bullying is referred to 'situations in which someone is subjected to social isolation or exclusion, his or her work and efforts are devalued, and he or she is threatened or otherwise worn down or frustrated'. [54] In a study on workplace bullying and sickness absence in hospital staff by M Kivimaki et al, it was reported that five percent of the workers experienced workplace bullying and workplace bullying was associated with sickness absenteeism. Reduction in workplace bullying can help the victim to overcome such problems and also to reduce sickness absenteeism and the economic burden on the industry.[54] Burnouts is a stress-related phenomenon and results in long term sickness absences.[55] M Borritz et al, have reported that burnout, as one of the predictors of absenteeism.[19]

A study by Labriola et al suggests that physical work environment factors predicts long term sickness absence at individual levels whereas psychosocial factors predicts the long term sick absence at workplace level.[56]

B. Relations with Management:

'Much absence due to work related stress is in fact disaffection rather than disease' and 'we need better management rather than better medicine' are the words told by Dale Archer in his letter on sickness absence.[57]

In a study by S Michie et al, 'demand-control-support model' was suggested to reduce the sickness absenteeism among hospital cleaning staff. It involved giving more control over their job and involving them in certain decision-making, which can have an effect in reducing the sickness absenteeism.[58]

J Vahtera et al have reported that organizational removal from the work can cause an increase in sickness absence and risk of cardiovascular diseases.[59] S Khan and T C AW in their letter on 'auditing absence due to sickness' mentions about the need for auditing the sickness absence, he describes that sickness absence is a 'complicated procedure' until the exact underlying causes are not studied. [60]

2.4. Iron and steel workers:

Steel works industries are known to be having more hazardous places of work.[61] A study from Singapore among private sector establishments has identified that among all the manufacturing industries, iron and steel industry experiences highest sickness absenteeism.[62] Iron and steel industries are having foundries of oven and furnaces, which involves high heat, noise, vibrations, and dusty environments. Therefore iron and steel workers are more prone for occupational health problems and experience more sickness absenteeism.[44, 63]

Many studies on iron and steel industrial workers suggested a high risk of respiratory morbidity among workers. Study by Chen P C et al, showed a high prevalence of respiratory illness among steel workers and it was also reported that the duration of employment, smoking, subjective dustiness and previous respiratory illnesses predicted the respiratory symptoms among steel workers.[64]

Study by Xu Z et al reported a 40 percent higher risk of lung and stomach cancer among iron and steel workers who had exposure to work place pollutants for a longer time.[22]

A study by Redmond CK et al reported that among steel workers, the mortality from causes of cardiovascular diseases and digestive system were found. And the mortality due to these causes was more observed from those who were working at hot zones of the steel industry for

longer durations. [65] One more study by Redmond CK et al in 1979, reported a higher risk for morbidities and mortalities of cardiovascular diseases and gastrointestinal diseases among workers working at hot zones in iron and steel industries.[44]

2.5. Certifying sickness absenteeism:

In India according to The Factories Act 1948, for obtaining a leave the worker should apply to the manager of the factory in advance of not less than 15 days to the specified day of leave from work, but for the reason of sickness leave this will not apply, the worker can obtain the leave himself and apply after the period of illness, the certifying surgeon shall be a registered medical practitioner, appointed by the state, or the authorities of the Government who is qualified according to Indian Medical Council Act 1933. [66]

Reporting, recording, notification and investigation of all work-related injuries and diseases, ill health and incidents are essential for monitoring of occupational health and safety of workers.[63]

2.6. Addressing Sickness absenteeism:

Many European Governments have adopted programmes to set medical standards for early retirements of workers with ill health and programmes to encourage long absentee workers to return back to their work. Some examples include 'Social engagement of companies' of Denmark[8] which aims at reducing the long absenteeism situation, a 'National Campaign to reduce absenteeism' by Norway Government and the social partners is one such example.[7]

2.6.1. Sickness Absenteeism-Health System:

Some times the view of health professionals and co-ordination between curative doctors and occupational health professionals is important in addressing sickness absenteeism

In a study by J R Anema et al on disability management by doctors it was observed that clinical waiting period, duration of treatment, and the view of the treating physicians were obstacles for return-to-work after a sickness incident and the communication between occupation physicians and treating physicians was also limited and influenced sickness absence.[67]

An ILO report of 2005 emphasizes on the fact that iron and steel making enterprises should set pre-determined plans and standards in order to measure the safety standards and monitor the safety and health of the workers in order to create a developing and promoting health culture.[63]

2.6.3. Worker - friendly policies:

Time flexible work policies and family friendly and employee friendly environments for a worker can result in better health of employees, reduce absences, reduce health care costs and increase commitments of the workers towards increasing the productivity of an industry.[68]

Chapter 3

Justification for the study

3. Political economy of the market forces:

3.1. The effect on labour:

Due to increase in globalization, resulting in exchange of technology, goods, labour and jobs globally, the integration of economy in labour market has its effects on the labour force. It is observed that globalization has created more skilled labour and reduction in unskilled labour, increasing technology application resulting in the large wage gap between skilled and unskilled labourers and increasing the unemployment rates and in turn this could have effects on the job requirement, job security of the labour force. This trend has produced dramatic effects on wage and created income inequality. [69]

India initiated this process in 1991 through its approach-privatization, liberalization and globalization - in the name of economic reforms, which adversely affects the employment opportunities and labour welfare.[70] Through liberalization the Government has created an encouraging environment for foreign goods against domestically produced goods, this has created more competition, and forcing the Government and private industries in the country to adopt technology, labour from foreign resources. These developments are important when we are looking at labour welfare and related factors.[71]

Subcontracting, outsourcing arrangements, emergence of new actors and pro-investor policies could negatively affect labour welfare policies. Informal sector is affected more in these labour market developments; reduction in power of labour unions and lack of power for labour unions in social dialogues affects the labour welfare.[72]

3.2. Indian industrial sector:

Indian industrial sector is one of the fast growing sectors in the world, and India is having the policies of contracting services in labour market, privatization, globalization and liberalization[73]. Studying effects of these developments in labour market on labour welfare policies are important in this period of fast growth.

Study of health conditions of workers is important to identify health problems and studying the health of workers in relation with their social and family related factors provides understanding of the burden of health problem, in relation to social context, which can help to bring necessary changes in labour welfare policies and to create healthy working conditions of workers.

Through literature it is evident that sickness absenteeism, is an important measure which reflects the health status of workers, less information is available among industrial workers sickness absenteeism in India and Karnataka state; Steel works industries are known to be having more hazardous places of work.[61] However, little published information is available on iron and steel industries in India.

3.3. Indian Iron and Steel industry:

Indian Steel industry is described as the 'potential global steel hub' internationally, [73] which is expanding, as India is one of the fastest growing economies of the world.[73] India is the ninth largest steel producer of the world.[74] The steel production growth rate nationally is 7 percent per annum since last fifteen years. Next projected rate is 7-8 percent per annum in future.[75] To reach anticipated target of producing 110 metric Ton by 2020, the Steel industry

in India needs an additional workforce of 2, 20,000. And it says that creating one man-year of employment results in job opportunity for 3.5 man-year employment in other sectors as the steel industry is closely linked with other industries like mining, transport, construction, machinery and steel fabrication. By 2020 the growth of steel industry will result in creating one million employment opportunities in India.[75] As the steel industry is growing at a fast rate, there is a competition between industries to increase their productivity. Therefore there is a need to study the health status of workers in these industries in this period of fast growth. By undertaking this study, I have made an effort to study the health problems and health related factors through studying sickness absenteeism and its associated factors in a public sector iron and steel industry in the state of Karnataka.

Chapter 4

Objectives and methodology

4.1. Objectives of the study:

1. To estimate the prevalence of sickness absenteeism among industrial workers in an industry in Karnataka
2. To Study the factors associated with sickness absenteeism among industrial workers in an industry in Karnataka

4.2. Methodology:

4.2.1. Study Design:

- Cross-Sectional Study

4.2.2. Study Setting:

* Visvesvaraya Iron and Steel Plant, Bhadravathi, Karnataka

4.2.3. Sample Frame:

* A total number of 2525 employees were working in the industry. Permanent workers constituted the majority of the workforce in the industry
* **Inclusion Criteria:** Regular employees who joined the industry at least one year back
* After applying inclusion criteria, there were 2464 workers available for the study.

4.2.4. Sample Selection Procedure:

* Stratified random sampling was done in order to achieve sufficient proportion of male and female workers/ blue collar and white collar workers/ shift and regular workers

4.2.5. Sample Size Estimation:

- Estimated by Epi Info 2002,
- Expected prevalence of sickness absenteeism was taken as 60 percent (From available Indian studies) [16, 17]
- 10 percent of the prevalence on either side of 60 percent is taken as worst acceptable limit (54%, 66%) for the calculation
- Considered at 99 percent confidence level
- Sample size estimated =375

Sample size (n) estimation steps:

$$n^1 = \frac{(2.58)^2 P Q}{d^2}$$

where, 2.58 = confidence limit at 99% confidence interval
n^1 = sample size for a general population
P = Expected prevalence of sickness absenteeism
Q = (1 - P)
d = allowable error (taken as 10% of P)

$$n^1 = \frac{(2.58)^2 * 0.6 * 0.4}{(0.06)^2} = 442$$

Then sample size for industrial population of 2464, is calculated as follows:

$$n = \frac{n^1}{1 + \frac{n^1}{N}}$$ where N = Total sample frame (2464)

$$n = \frac{442}{1 + \frac{442}{2464}} = \mathbf{375}$$

4.3. Variables:

Variables included in the study are shown below:

Predictor variables		
Occupational	**Organizational**	**Individual**
1.Type of worker - Blue collar - White collar 2.Work environment Characteristics - Heat - Noise - Vibrations - Dust - Physical stress - Mental stress 3.Shift work 4. Injury/Accidents	Work place relations- 1.Relation with co-workers 2.Relation with superiors	1. Age 2. Sex 3. Educational level 4. Number of dependents 5. Duration of work 6. Socio economic status 7. Distance of residence from the work place 8. Tobacco use 9. Alcohol use 10. Health conditions

Outcome Variable: Sickness absenteeism

4.3.1. Operationalization of variables:

- **Sickness absenteeism:** Any worker who lost any working day due to the reasons of Sickness or Injury in the past 12 months
- **Blue-collar worker:** who is working at production sites, furnaces, plants, of the industry
- **White-collar worker:** who is working at office side and service side of the industry
- **Shift work:** includes those who work in rotational shifts in work and having atleast three or more than three days of rotational works in a week

Tobacco use:

(Taken from WHO, Guidelines for controlling and monitoring Tobacco epidemics) [76]

- **Current tobacco users**: someone who at the times of survey, uses tobacco in any form either daily or occasionally
- **Current smoker**: someone who at the times of survey, smokes in any form either daily or occasionally
- **Non-smokers:** comprises individuals who are **never-smokers** (those who have never smoked at all)
- **Former-Smokers**: People who were former smokers but currently do not smokes at all or those who were former occasional smokers

Alcohol use:

(Taken from NCD Risk Factor Surveillance. GOI-WHO Collaborative Programme) [77]

- **Current Drinker**: Those who consumed one or more drinks of any type of alcohol in the year preceding the survey (taken past 12 months)
- **Former drinker**: Those who have ever drunk alcohol but those who did not consume one or more drinks during the year preceding the survey (taken past 12 months)
- **Lifetime abstainer**: Those who never consumed one or more drinks of any type of alcohol

4.4. Data collection methods:

4.4.1. Tools for data collection

1. Pre-tested structured interview schedule
2. Review of records at personnel department, VISP industry, Bhadravathi.

A. Structured interview schedule:

Interview schedule consisted of four sections, including general informations, workplace informations, health information and sickness absenteeism informations. The questions on personal characteristics, tobacco use, workplace relations and sick leave information were modified and adopted from a Malaysian Ministry of Health, occupational health Unit's survey by Hasniza bt. Abdullah.[78] The questions were modified according to industrial setting.

Questions on AUDIT (Alcohol Use Disorder Identification Test) test for alcohol use [79] were adopted from A Clinician's guide developed by U S National Institute on Alcohol Abuse and Alcoholism, U.S. Department of Health and Human Services

Classification of residing distance, was adopted from a study by M Lal and J Biswas on group D employees of a hospital from Amritsar.[2] Information on age, number of dependents in the household, were collected as continuous variables, and then classified according available classifications from previous studies.

B. Review of records at personal department:

Record review was undertaken in order to identify the recorded sick leaves of the participants. The number of workplace injuries, profile of the industry, occupational health facilities provided at the industry was collected.

4.4.2. Data collection technique:

The interview schedule was pre-tested in the study setting before the beginning of the study. - Validation and translation of the interview schedule was done in local language Kannada. I personally collected the data during the period of June 15th to September 15th 2007. Six to eight interviews were conducted in a day.

4.4.3. Ethical Considerations:

Formal written permission was obtained from the management of the VISP industry.

The Institutional Ethics Committee of SCTIMST formally approved the research. Informed consent was taken from all the informants.

A. Informed consent:

The consent form and interview schedule was translated in Kannada (local language). The study was explained to all informants before the interview. Participants in the study were informed about their choice to refuse to answer any question or series of questions or not to participate entirely in the study.

B. Privacy:

The interviews were taken at the house of the participants. Full privacy was ensured during interviews by selecting the time for interviews according to the comfort of the participants.

C. Confidentiality:

Confidentiality of the participants, about their sickness, and practices of utilizing sickness benefits was maintained. Informations on workplace relations and relations with management were kept confidential and dealt with carefully.

4.4.4. Project Management:

A. Staffing and work plan:

Only principal Investigator was involved in the data collection and management. At the end of each days work the interview schedules were crosschecked to avoid any technical errors.

B. Data Storage and transfer and Management:

Data were stored by myself, throughout the study. The hard copies were entered to computer software at the end of each day's work, and the back up of all the soft copies were maintained for the safety of the data. Safety and monitoring of data had been done in the best possible manner.

4.4.5. Data Analysis:

- Data entered in SPSS 11.5 soft ware.
- Binary logistic regression and multiple linear regression analyses were done using SPSS software

Chapter 5

RESULTS

- Univariate analysis was undertaken to study the sample characteristics
- Bivariate analysis was done to study the relationship of the predictor variables with sickness absenteeism
- Binary logistic regression analysis was done to study the association of predictor variables with sickness absenteeism
- Multiple linear regression analysis was done by taking the number of days lost per worker per year due to sickness absenteeism as an outcome variable.

I. UNIVARIATE ANALYSIS

5.1. Sample Characteristics:

- Sample consisted a total of 353 industrial workers {Male= 245 (69.4%)}.
- A response rate of 94.13 percent was observed for the study.
- Mean age of the participants was 55.12 years (Male=55.22 and Female=54.9).
- Descriptions of personal characteristics is shown in Table.1

5.1.1. Personal Characteristics:

Table.1: Personal characteristics

		Male		Female		Total	
		N	%	N	%	N	%
Age Group	25-35	6	2.4	0	Nil	6	1.7
	36-45	3	1.2	1	.9	4	1.1
	46-55	81	33.1	69	63.9	150	42.5
	56 & Above	155	63.3	38	35.2	193	54.7
	Total	245	100	108	100	353	100.0
Level of Education	No Formal Education	9	3.7	11	10.2	20	5.7
	Primary Education	65	26.5	44	40.7	109	30.9
	Secondary Education	101	41.2	26	24.1	127	36.0
	Graduate	62	25.3	27	25.0	89	25.2
	Post Graduate	8	3.3	0	Nil	8	2.3
	Total	245	100	108	100	353	100.0
Residing Distance	<5 kms	186	75.9	93	86.1	279	79.0
	5-10 kms	51	20.8	14	13.0	65	18.4
	>10 kms	8	3.3	1	.9	9	2.5
	Total	245	100.0	108	100.0	353	100
Marital Status	Single	5	2.0	1	.9	6	1.7
	Married	229	93.5	88	81.5	317	89.8
	Separated	5	2.0	7	6.5	12	3.4
	Divorced	3	1.2	1	.9	4	1.1
	Widow/Widower	3	1.2	11	10.2	14	4.0
	Total	245	100.0	108	100.0	353	100.0
Type of Family	Nuclear	135	55.1	55	50.9	190	53.8
	Extended	94	38.4	46	42.6	140	39.7
	Joint	16	6.5	7	6.5	23	6.5
	Total	245	100.0	108	100.0	353	100.0
No. Of Dependents in the Family	Less than 2	36	14.7	17	15.7	53	15
	2	82	33.5	28	25.9	110	31.2
	3	58	23.7	29	26.9	87	24.6
	4	43	17.6	29	26.9	72	20.4
	More than 4	26	10.6	5	4.6	31	8.8
	Total	245	100.0	108	100.0	353	100.0

5.1.2.Income and socio-economic status description:

Description about the average monthly income and classification of socio-economic status depending upon income are shown in table 2. As the number of workers in income groups 1st and 4th were less, socioeconomic status was classified into two groups

Table 2: Income and socioeconomic status

		Male		Female		Total	
		N	%	N	%	N	%
Average Monthly salary	5001-10000	0	Nil	2	1.9	2	.6
	10001-15000	162	66.1	83	76.9	245	69.4
	15001-20000	75	30.6	22	20.4	97	27.5
	>=20001	8	3.3	1	.9	9	2.5
	Total	245	100.0	108	100.0	353	100.0
Socio-Economic Status	Low (<=15000)	162	66.1	85	78.7	247	70
	High (>15000)	83	33.9	23	21.3	106	30
	Total	245	100.0	108	100.0	353	100

5.1.3.Worker Characteristics:

Description of workers in different types of work and pattern of work are shown in Table3

Table 3: Type and pattern of work

		Male		Female		Total	
		N	%	N	%	N	%
Shift Work	Shift Work	159	64.9	14	13.0	173	49.0
	Regular Work	86	35.1	94	87.0	180	51.0
	Total	245	100.0	108	100.0	353	100.0
Type of Work	Blue Collar Work	153	62.4	14	13.0	167	47.3
	White Collar Work	92	37.6	94	87.0	186	52.7
	Total	245	100.0	108	100.0	353	100.0

5.1.4.Tobacco Use:

Ever and current use of any form of tobacco, and proportion of smokers and smokeless forms of tobacco users are shown in Table 4

Table 4: Tobacco use

N=351	Ever User	Current User
Any Form	**184 (52.4%)**	**128 (36.5%)**
Smokers	78 (22.2%)	58 (16.5%)
Smokeless Tobacco users	143 (40.7%)	106 (30.2%)

A. Smokers: -

Response rate for all the questions on smoking status was 99.2 percent.

There were no smokers among females. The proportion of participants with there smoking status is shown in Table 5

Table 5: Smoking status

		Male	
		N	%
Smoking	**Never Smoker**	165	67.3
	Current Smoker	58	23.7
	Former Smoker	20	8.2
	Non responders	2	0.8
	Total	245	100

Type of Smoking: - 32 percent of the Smokers used *beedis* and 64 percent were using cigarettes, 4 percent were using both the forms of smoking.

B. Smokeless tobacco Use:

Response rate for all the questions on smokeless tobacco use was 94.6 percent.

Proportion of workers using smokeless forms of tobacco was more when compared to smoking. The description of smokeless tobacco use and different forms of use are shown in table 6 and 7

Table 6: Smokeless tobacco use status

		Male		Female		Total	
		N	%	N	%	N	%
Smokeless Tobacco Use	Never User	140	57.1	67	62.0	207	58.6
	Current User	78	31.8	28	25.9	106	30.0
	Former User	17	6.9	4	3.7	21	5.9
	Non responders	10	4.1	9	8.3	19	5.4
	Total	245	100	108	100	353	100

Table 7: Type of smokeless tobacco used

		Male		Female		Total	
		N	%	N	%	N	%
Smokeless Tobacco Use	Snuff	3	3.85	0	0	3	2.83
	Betel	41	52.56	21	75.00	62	58.49
	Ghutka	30	38.46	2	7.14	32	30.19
	Chewing Tobacco	2	2.56	0	0	2	1.89
	More than one type	2	2.56	5	17.86	7	6.60
	Total	78	100	28	100	106	100

5.1.5. Alcohol Use:

Response rate for all the questions on alcohol use was 95.15 percent. Prevalence of alcohol use is shown in Table 8. Alcohol use was more among men than women.

Table 8: Alcohol use status

		Male		Female		Total	
		N	%	N	%	N	%
Alcohol Use	Lifetime abstainer	155	63.3	104	96.3	259	73.4
	Current User	40	16.3	3	2.8	43	12.2
	Former User	35	14.3	0	0	35	9.9
	Non responders	15	6.1	1	0.9	16	4.5
	Total	245	100.0	108	100.0	353	100.0

The table 8.1 is showing the proportion of current alcohol use according to type of worker, pattern of work, and socioeconomic status of workers:

Table 8.1: Current alcohol use

Type of work	Blue collar worker	N = 160	28 (17.5%)
	White collar worker	N = 177	15 (8.5%)
Pattern of work	Shift worker	N = 164	30 (18.3%)
	Regular day worker	N = 173	13 (7.5%)
Socioeconomic status	Lower	N = 235	28 (11.9%)
	Higher	N = 102	15 (14.7%)

AUDIT Test for alcohol use:

Alcohol Use Disorder Identification Test was applied to all the current users of alcohol. With a response rate of 86 percent, the test was found positive among 32.4 percent of the current users.

(Note: -AUDIT test consisted of scoring for 10 questions related to current alcohol use,[79] from 0 to 40, test is considered as positive for males having a score of >= 8, and females having a score of >= 4)

5.2. Perception of Work place environment characteristics:

Individual worker's perceptions about seven characteristics at their work environment were asked and graded; the responses are shown in Table 9

Table 9: work environment characteristics perceptions

	Grade of Perceiving	Frequency	Percentage (%)
Heat at Workplace	High	48	13.7
	Moderate	168	48
	Less	128	36.6
	Not at all	6	1.7
	Total	N=350	100.0
Noise at work place	High	46	13.1
	Moderate	149	42.6
	Less	149	42.6
	Not at all	6	1.7
	Total	N=350	100.0
Perceiving Unsafe ness at workplace	High	31	8.9
	Moderate	86	24.6
	Less	204	58.3
	Not at all	29	8.3
	Total	N=350	100.0
Dust at Workplace	High	29	8.3
	Moderate	82	23.4
	Less	160	45.7
	Not at all	79	22.6
	Total	N=350	100.0
Vibration at work place	High	13	3.7
	Moderate	49	14.1
	Less	94	27
	Not at all	192	55.2
	Total	N=348	100.0
Physically Stress at workplace	High	40	11.6
	Moderate	294	83.8
	Less	15	4.3
	Not at all	2	.6
	Total	N=351	100.0
Mentally Stress at workplace	High	82	23.2
	Moderate	256	72.5
	Less	15	4.2
	Not at all	0	0
	Total	N=353	100

5.3. Health problems:

Worker's health problems in the past 12 months were obtained and 81 percent of the workers said that they experienced atleast one health problem in the past 12 months.

The health problem information was categorized into 18 groups, out of which musculoskeletal problems (31.4%), gastrointestinal problems (25.8%), hypertension (24.4%) and respiratory problems (18.1%) were found to be high. The details of these health problems is shown in Table 10

Table 10: Common health problems experienced

	Male		Female		Total	
	(N=245)	%	(N=108)	%	N=353	%
Musculoskeletal problems	86	35.1	25	23.1	111	31.1
Gastro intestinal Problems	73	29.8	18	16.7	91	25.8
Hypertension	48	19.6	38	35.2	86	24.4
Respiratory problem	48	19.6	16	14.8	64	18.1
Minor ailments	39	15.9	29	26.9	68	19.3

Men experienced health problems related to musculoskeletal problems (35.1%) and gastro intestinal problems (29.8%) the most, whereas women experienced hypertension (35.2%) and other minor ailments (26.9%) as the most common health problem in the past 12 months.

5.3.1. Health Problems according to type of worker:

Among blue collar workers health problems related to musculoskeletal system (43.7%), gastro intestinal system (30.5%) and hypertension (25.7%) were found high whereas among white collar workers hypertension (23.1%) was found to be high. The comparison of health problems is shown in table 11

5.3. Health problems:

Worker's health problems in the past 12 months were obtained and 81 percent of the workers said that they experienced atleast one health problem in the past 12 months.

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	(N=245)	%	(N=108)	%	N=353	%
Musculoskeletal problems	86	35.1	25	23.1	111	31.1
Gastro intestinal Problems	73	29.8	18	16.7	91	25.8
Hypertension	48	19.6	38	35.2	86	24.4
Respiratory problem	48	19.6	16	14.8	64	18.1
Minor ailments	39	15.9	29	26.9	68	19.3

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Table 11: Health problems according to type of work

	Blue Collar		White Collar		Total	
	(N=167)	%	(N=186)	%	N=353	%
Musculoskeletal problems	73	43.7	38	20.4	111	31.1
Gastro intestinal Problems	51	30.5	40	21.5	91	25.8
Hypertension	43	25.7	43	23.1	86	24.4
Respiratory problem	39	23.4	25	13.4	64	18.1

5.3.2. Health problems according to pattern of work:

Shift workers experienced musculoskeletal problems (41.6%), gastro intestinal problems (29.5%) and hypertension (26%) as the most common illness whereas regular workers experienced gastrointestinal (22.2%) and hypertension (22.8%) as the most common illnesses in the past 12 months. The comparison is shown in the table 12

Table 12: Health problems by pattern of work

	Shift worker		Regular Worker		Total	
	(N=173)	%	(N=180)	%	N=353	%
Musculoskeletal problems	72	41.6	39	21.7	111	31.1
Gastro intestinal Problems	51	29.5	40	22.2	91	25.8
Hypertension	45	26	41	22.8	86	24.4
Respiratory problem	40	23.1	24	13.3	64	18.1

5.3.4. Proportion having History of hospitalization in the past 12 months:

Twenty-six (7.4%) workers were hospitalized atleast once in the past 12 months due to sickness or injury. The proportions of hospitalizations according to sex, type and pattern of work are shown in table 13

History of hospitalization is found more among blue collar workers when compared with white collar workers, and among workers with different patterns of work, shift workers were having more history of hospitalization when compared to regular workers

Table 13: Hospitalizations

		Hospitalized		Total
		Frequency	%	(N)
Sex	Men	19	7.8	245
	Women	7	6.5	108
Type of Work	Blue Collar	17	10.2	167
	White Collar	9	4.8	186
Shift Work	Shift Work	17	9.8	173
	Regular Work	9	5	180

5.4. Sickness absence data

5.4.1. Proportion who lost any working day due to reasons of Sickness or Injury in the past 12 months:

Among the participants 66.9 percent missed any of the working days due to the reasons of sickness or injury, and the distribution among men and women is shown in Table 14.

4.2 percent of the workers said that they couldn't recall about their sickness absence history of the past 12 months

Table 14: Sickness absenteeism

Sickness absenteeism	Male		Female		Total	
	Frequency	%	Frequency	%	Frequency	%
Yes	162	66.1	74	68.5	236	66.9
No	75	30.6	27	25.0	102	28.9
Don't Know	8	3.3	7	6.5	15	4.2
Total	245	100.0	108	100.0	353	100

5.4.2. Injury in the past 12 months:

Thirty-six (10.2 %) workers had any kind of injury in the past 12 months. Proportion of injury was found equally among male and female workers (10.2%) in the past 12 months.

Place of Injury:

Among men 52 percent had injury at work spot, where as 27.3 percent of the women had injury at the work spot, the distribution of place of injury is shown in Table 15.

Table 15: Place of injury

Place of Injury	Male		Female		Total	
	Frequency	%	Frequency	%	Frequency	%
At work	13	52.0	3	27.3	16	44.4
Out side work	8	32.0	7	63.6	15	41.7
Both	4	16.0	1	9.1	5	13.9
Total	25	100.0	11	100.0	36	100.0

5.5. Sick Leave Information:

Three - hundred - twenty (90.7%) of the workers availed atleast one sick leave in the past 12 months (Male = 90.6% and female = 90.7%). Out of which 53 percent of the respondents had availed atleast one sick leave in the past one month.

The reasons for obtaining sick leave were asked, with a response rate of 95 percent, 336 respondents had 208 spells of absences in the past one month. The stated reasons for availing sick leave in the past one month are shown in Table 16

Table 16: Reasons for obtaining sick leave

Reasons	1st Spell	2nd Spell	3rd Spell	Total	%
Sickness	138	13	0	151	72.6
Injury	13	4	0	7	3.4
Family Responsibilities	15	5	1	21	10.0
Social Responsibilities	21	5	2	28	13.5
Pregnancy Related Reasons	0	0	0	0	0
Abortion Related Reasons	0	0	0	0	0
Gynecological Problems	1	0	0	1	0.5
Total	178	27	3	208	100

Sickness was the most common cause for availing a sick leave among both men and women, followed by social causes among men and family responsibilities among women, it is shown in Table 17

Table 17: common reasons for obtaining sick leave

Order of causes	Men	Women
1	Sickness (71.9%)	Sickness (74.5%)
2	Social Responsibilities (14.4%)	Family Responsibilities (11%)
3	Family Responsibilities (9.8%)	Social Responsibilities (10%)

II. RESULTS: BIVARIATE ANALYSIS

5.6. Personal characteristic variables and sickness absenteeism:

Relation of sickness absenteeism with different personal characteristic variables is shown in table 18

Table 18: Personal characteristics variables with sickness absenteeism

Variables	Proportion of having sickness absence in the groups	P Value
Sex	Male=68.4% Female=73.3%	0.441
Level of Education	No Formal Education=77.8% Primary Education=77.9% Secondary Education=70.5% Graduate=62.8% Post Graduate=12.5%	**0.001**
Marital Status	Married living with spouse = 68.8% Others = 79.4%	0.277
Residing distance from workplace (in Kms)	<5=68.4% 5-10=76.2% >10=66.7%	0.472
Number of dependants in the Household	Having < 4 dependents = 66.1% Having 4 or > 4 dependents = 78.4%	**0.033**
Type of Family	Nuclear=65.7% Others = 74.4%	0.107
Socioeconomic Status	Low = 75.5% High = 56.4%	**0.001**

5.6.1. Age:

As the number of workers in the first and second age group was low, for further analysis, age was taken as a continuous variable. The difference in the mean age of those having sickness absenteeism (55.6 years) and those not having sickness absenteeism (53.9 years) was found

to be statistically significant (p=0.013). But the linear relationship between age and number of days of sickness absenteeism per year was very weak with, correlation coefficient,

r = 0.097

5.6.2. Number of dependents in the household:

Since the previous studies have shown an association between (less than 4 and more than / equal to 4) number of dependants and sickness absenteeism, [25] number of dependents in the household was classified into binary variable and its association with sickness absenteeism is shown in table 19

When the numbers of dependents in the household was categorized as less than four and four or more than four, the number of dependents in the household was found to be associated with sickness absenteeism (p = 0.033)

Table 19: Number of dependents and sickness absenteeism

Number of Dependents	Frequency	Proportion of having Sickness Absence in the Groups	P Value
> 4 or 4	103 (29.2%)	78.4%	0.033
< 4	250 (70.8%)	66.1%	

5.6.3. Marital Status:

Marital status was categorized into two groups as married living with spouse and others. But the difference in sickness absenteeism between these categories was not significant.

5.6.4. Type of Family:

Type of family was categorized into two groups as nuclear family and others. But the difference in sickness absenteeism between these categories was not significant

From the table 18, it can be seen that among the personal characteristic variables, level of education, number of dependents in the household and socioeconomic status were found to be significantly associated with sickness absenteeism.

5.7. Tobacco use and sickness absenteeism:

5.7.1. Smoking Status:

Table 20: Ever smoker and sickness absenteeism

Variables	Frequency	Proportion of having Sickness Absence in the Groups	P Value
Ever Smoker	78 (22.2%)	68.4%	0.903
Never Smoker	273 (77.8%)	70%	

Table 21: Smoking status and sickness absenteeism

Variables	Frequencies	Proportion of having Sickness Absence in the Groups	P Value
Never Smoker	273 (77.8%)	70%	0.217
Current Smoker	58 (16.5%)	73.7%	
Former Smoker	20 (5.7%)	52.6%	

By looking at the comparisons made between different group of smoking status, shown in Table 20 and 21, it is evident that smoking status was not associated with sickness absenteeism in this study

5.7.2. Smokeless Tobacco Use:

Table 22: Ever use of smokeless tobacco and sickness absenteeism

Variables	Frequency	Proportion of having Sickness Absence in the Groups	P Value
Ever User	143 (40.7%)	72.3%	0.456
Never User	208 (62%)	67.7%	

Table 23: smokeless tobacco status and sickness absenteeism

Variables	Frequencies	Proportion of having Sickness Absence in the Groups	P Value
Never User	208 (62%)	67.7%	0.633
Current User	106 (31.7%)	72.5%	
Former User	21 (6.3%)	73.7%	

By looking at the comparisons made between different group of smokeless tobacco users, shown in Table 22 and Table 23, it is evident that smokeless tobacco use is not associated with sickness absenteeism

5.6. Alcohol Use and Sickness absenteeism:

Table 24: Ever drinker and sickness absenteeism

Variables	Frequency	Proportion of having Sickness Absence in the Groups	P Value
Ever User of Alcohol	91 (25.9%)	79.8%	**0.022**
Life-time Abstainer	260 (76.9%)	65.9%	

Table 25: Alcohol use status and sickness absenteeism

Variables	Frequencies	Proportion of having Sickness Absence in the Groups	P Value
Life-time Abstainer	260 (76.9%)	65.9%	0.098
Current User	43 (12.8%)	79.1%	
Former User	35 (10.4%)	78.8%	

Table 26: AUDIT test and sickness absenteeism

Variables	Proportion of having Sickness Absence in the Groups	P Value
AUDIT Score	Positive=91.7% Negative=64%	0.119

Among the variables related to alcohol use, ever use of alcohol is found to be significantly associated with sickness absenteeism (p= 0.022)

5.7. Work and sickness absenteeism:

Table 27: Type and pattern of work with sickness absenteeism

Variables	Proportion of having Sickness Absence in the Groups	P Value
Shift Work	Yes =75% No=64.9%	0.058
Type of Worker	Blue Collar=76.7% White Collar=63.7%	0.013

From Table 27, it is evident that among the variables related to pattern of work and type of work, significant association was found between type of work and sickness absenteeism (p= 0.013)

5.8.1. Duration of work and sickness absenteeism:

The linear relationship between duration of work in the industry and number of days lost due to sickness were related with a weak correlation of r = 0.14

5.8.2.work environment characteristics and sickness absenteeism:

Table 28: work environment perceptions and sickness absenteeism

	Grade of Perceiving	Proportion of having Sickness Absence in the Groups (%)	P Value
Heat at Workplace	High	80.9	**0.001**
	Moderate	71.3	
	Less	66.4	
	Not at all	0	
Noise at work place	High	77.8	**0.025**
	Moderate	69.5	
	Less	69.2	
	Not at all	16.7	
Perceiving Unsafe ness at workplace	High	83.3	0.254
	Moderate	69.1	
	Less	69.0	
	Not at all	59.3	
Dust at Workplace	High	84.6	0.224
	Moderate	72.2	
	Less	68.6	
	Not at all	63.6	
Vibration at work place	High	92.3	0.225
	Moderate	63.6	
	Less	71.9	
	Not at all	67.9	
Physically Stress at workplace	High	84.6	0.124
	Moderate	68.3	
	Less	57.1	
	Not at all	50.0	
Mentally Stress at workplace	High	71.3	0.896
	Moderate	69.1	
	Less	73.3	
	Not at all	0.0	

Among the variables related to worker's perceptions about their work environment characteristics, difference perceptions of heat and noise were found to be significantly associated with sickness absenteeism

5.8.3. Work place relations (with co-workers and superiors):

(0-20 Scoring was given depending upon responses of five Questions under each category to assess the personal relationship of the worker with co-workers and superiors at their workplace. Lower score indicates a good relationship with co-workers and superiors)

Table 29: workplace relations and sickness absenteeism

	Mean of Score Among those Having Sickness Absence in the past 12 Months	**Mean of Score Among those Without Sickness Absence in the past 12 Months**	**P Value**
Relation with Co-Workers	10.35	10.04	0.136
Relation with Superiors	10.85	9.88	0.000

The difference in relations with superiors at workplace was found to be significantly associated with sickness absenteeism.

5.8. Health problems and sickness absenteeism:

From Table 30, we can see that having health problems of musculoskeletal system, gastro intestinal system, hypertension, respiratory system and having other minor illnesses are significantly associated with sickness absenteeism

Table 30: Health problems and sickness absenteeism

Health Problem	Proportion of having Sickness Absence in the Groups	P Value
Musculoskeletal Problem	Yes=87% No=61.7%	**0.000**
Hypertension	Yes=84.3% No=65.1%	**0.001**
Respiratory Problem	Yes=82.8% No=66.8%	**0.018**
GI Problem	Yes=80% No=66.1%	**0.020**
Cardiovascular Problem	Yes=90.9% No=69.1%	0.184
Neurological Problem	Yes=87.5% No=69.4%	0.443
Gynecological Problem	Yes=100% No=70.7%	0.108
Diabetes	Yes=86.2% No=68.3%	0.072
Cancer	Yes=100% No=69.6%	0.557
Stroke	Yes=100% No=69.6%	1.000
Asthma	Yes=100% No=69.3%	0.184
Skin Diseases	Yes=50% No=70.1%	0.587
Dental Problem	Yes=90.9% No=69.1%	0.184
Eye Problems	Yes=73.3% No=69.7%	1.00
ENT Problems	Yes=88.9% No=68.8%	0.122
Others (Minor ailments like Nonspecific Fever, Viral Fever)	Yes=88.1% No=65.3%	**0.000**

5.9.1. Tobacco use, Alcohol use and Health problem:

The proportion of having a health problem was found to be high among current and former users of alcohol when compared with lifetime abstainers. This difference is statistically significant (P = 0.004)

Table 31: alcohol use and health problems

Alcohol Use	Health problem		P Value
	Yes	No	
Life time Abstainer	76.4%	23.6%	0.004
Current user	93.0%	7.0%	
Former user	94.3%	5.7%	

Then the association between alcohol use and health problem was studied by sex. It was found that the association was significant among men (p = 0.005), whereas in women it was not significant. This can be seen in table 32 and 33.

- **Table 32: Among men: Alcohol use and health problem**

Alcohol use	Health problem		P Value
	Yes	No	
Life time Abstainer	75.5%	24.5%	0.005
Current user	92.5%	7.5%	
Former user	94.3%	5.7%	

- **Table 33: Among women: Alcohol use and health problem**

Alcohol use	Health problem		P Value
	Yes	No	
Life time Abstainer	77.9%	22.1%	1.00
Current user	100.0%	.0%	
Former user	0%	0%	

5.9.3. Education level and health problems:

Table 34: Education level and health problem

	Health Problem in Past 12 months		Total
Level of Education	**Yes**	**No**	
No Formal Education	19 (95.0%)	1(5.0%)	20
Primary Education	93 (85.3%)	16 (14.7%)	109
Secondary Education	99 (78.0%)	28 (22.0%)	127
Graduate	72 (80.9%)	17 (19.1%)	89
Post Graduate	3 (37.5%)	5 (62.5%)	8
Total	286 (81.0%)	67 (19.0%)	353

From table 34, it is evident that proportion having health problems is more among those having lower level of education, and this difference of having health problems, between different levels of education of workers was found to be statistically significant ($p = 0.006$)

5.10. Description of number of days lost per worker per year:

Table 35: number of workdays lost per worker per year

	Variable	Mean of work-Days Lost Per Worker/12 Months	P Value
1	Sex	Male =16.53 Female = 16.29	0.924
2	**Shift Work**	Shift Worker =18.64 Regular Worker = 14.36	0.069
3	**Type of Work**	Blue Collar Worker = 21.52 White Collar Worker = 11.91	0.00

Important Findings noted from Bivariate Analysis:

From bivariate analysis it was found that age, level of education, number of dependents in the household, socio economic status, ever use of alcohol, type of work, different heat and noise perceptions at workplace, having health problems (of musculoskeletal system, hypertension, respiratory problem and gastro intestinal problems), and poor relations with superiors were found to be significantly associated with sickness absenteeism

III. BINARY LOGISTIC REGRESSION ANALYSIS

A. Mediation effect due to variables related to health problems:

When all the variables showing significant relations with Sickness absenteeism from bivariate analysis were taken in binary logistic regression, only variables of health problems were showing significant relation with the sickness absenteeism. It is shown in table 36

Table 36

Serial No	Variable	Significance	Odds Ratio	95% CI
1.	Respiratory Illness	0.016	2.802	(1.207, 6.505)
2.	Gastro-intestinal Disorders	0.001	3.207	(1.573, 6.540)
3.	Hypertension	0004	2.965	(1.409, 6.239)
4.	Musculoskeletal Problems	0.000	4.062	(1.937, 8.519)
5.	Other Minor Ailments	0.000	6.182	(2.535, 15.078)

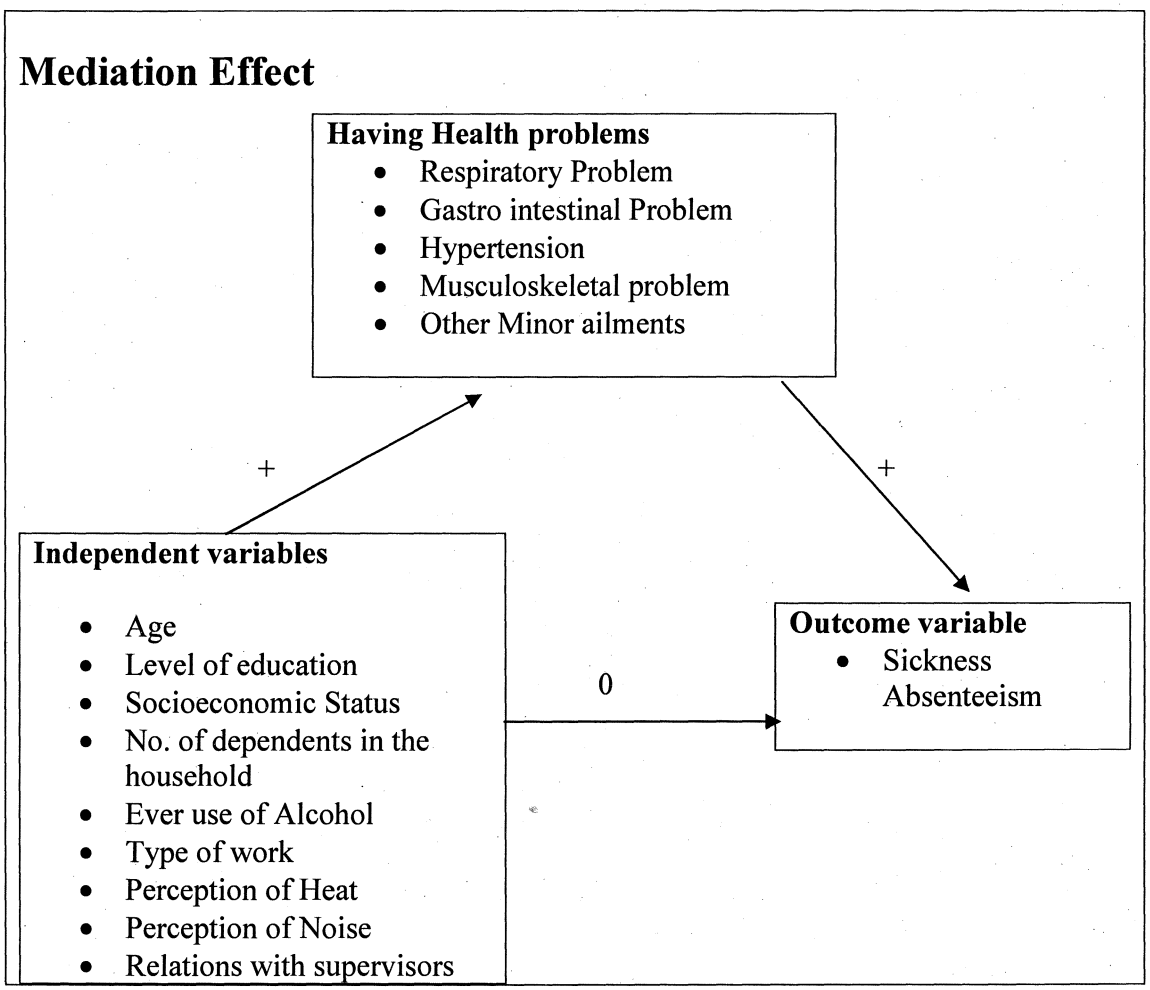
Having any health problem was significantly associated with sickness absenteeism ($p < 0.001$). When health problems were included in the model, the other variables, which were showing significant relations with the sickness absenteeism from bivariate analysis, were not showing any association.

From bivariate analysis and binary logistic regression analysis, it was seen that the health problems including musculoskeletal problems, gastro intestinal problems, hypertension, respiratory problems, and other minor ailments were showing significant associations with sickness absenteeism.

Then the relations between having any health problem and other variables including age, socioeconomic status, ever use of alcohol, type of work, perceptions about workplace heat and noise were studied. Then it was found that level of education (0.006), ever use of alcohol (0.001), type of worker (0.005), age (0.001) were showing significant association.

Therefore it was found that when taken in a binary logistic model, variables of health problems were acting as **Mediator Variables**[80, 81] Because of this effect, the variables age, level of education, type of work, workplace heat and noise perceptions, and socioeconomic status were not showing any associations in the binary logistic regression model

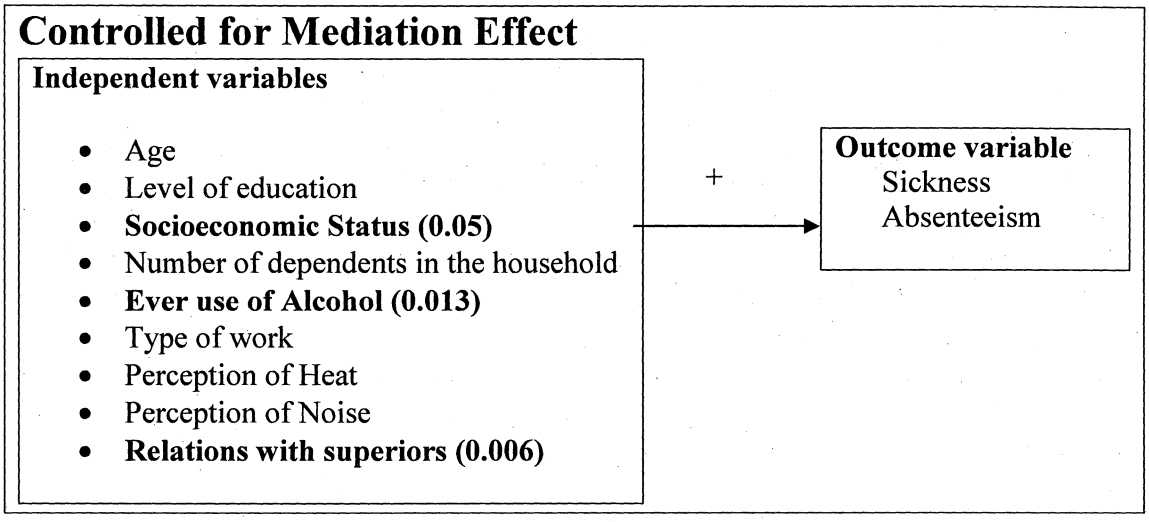
Diagram 1: Mediation effect due to variables related to health problems



B. Controlling for mediation effect:

Therefore, for other significant predictor variables (showing significant relation from bivariate analysis), excluding the variables of health problems, we continued with a binary logistic regression analysis

Diagram 2: Controlled for mediation effect due to variables of health problems



Then following variables were showing significant associations with the sickness absenteeism from binary logistic regression when controlled for mediation effect of variables related to health problems: -

Serial No	Variable	Significance	Odds Ratio	95% C I
1.	Socio-economic Status	0.05	1.97	(0.98, 3.93)
2.	Relations with superiors at workplace	0.006	0.78	(0.63, 0.93)
3.	Ever use of Alcohol	0.013	2.45	(1.20, 4.98)

Important Findings from binary logistic regression analysis:

From binary logistic regression analysis it was found that, lower socioeconomic status, ever user of alcohol and having poor relations with superiors at workplace were associated with sickness absenteeism

IV. MULTIPLE LINEAR REGRESSION ANALYSIS

Multiple linear regression analysis was performed by taking the outcome variable as the number of working days lost due to sickness absenteeism during the past 12 months. Since the number of working days lost by shift worker (18.64 days) and regular workers (14.36 days) was also different, shift work was also included in the linear regression analysis.

- Lower level of education (0.006), ever use of alcohol (0.05), poor relations with superiors at workplace (0.000) and shift work (0.028) were significantly associated with sickness absenteeism when adjusted for age, number of dependents in the family, type of work, duration of work, perceptions about workplace heat and noise and socio-economic status.

Important Findings from multiple linear regression analysis:

From multiple linear regression analysis it was found that, lower educational status, ever use of alcohol, shift work and having poor relations with superiors at workplace were associated with sickness absenteeism

Chapter 6

Discussion and Limitations of the study

6.1. Discussion:

High prevalence of sickness absenteeism among industrial workers:

This study estimated 66.9 percent (men = 66.1% and women = 68.5%) of sickness absenteeism among industrial workers, with a loss of 16.4 days per worker per year due to sickness absenteeism, which was almost similar in both men and women. This was high when compared to previous studies on sickness absenteeism in India. Studies by Gandhi and A K Dutta in 1971 and 1978 respectively reported a proportion of 60 percent consistently.[16]. And 61 percent was reported by Das Pratima from Bihar.[17] The higher prevalence in this study could be due to the involvement of industrial workers of iron and steel firm, which is believed to be having more hazardous places of work resulting in high sickness absenteeism than other industries.[61 62]

Sickness absenteeism by sex

The proportion of sickness absenteeism among men and women was similar in this study which was contrary to earlier reports by Gandhi (1971), AK Dutta (1978), Das Pratima (1997) and Whitehall II study by M Kivimaki in 2003, which reported a high difference of sickness absenteeism between men and women .[9, 16, 17]. This could be due to fact that more men were working in shift work (64.9%) and blue collar work (62.4%) when compared with women workers (13% in both Blue collar and shift work) in our study, which is shown in table 3

ducational level – type and pattern of work:

he workers having lower educational level experienced more health problems, and reported ore sickness absenteeism, as the level of education increases the proportion of sickness bsence decreases (table 18). This is consistent with the previous studies by A K Dutta and R harma, [16] Socio-economic status was found to be associated with sickness absenteeism, orkers from lower socio-economic status had more sickness absenteeism compared to orkers from higher socio-economic status. This was also consistent with previous studies[16,] This could be due to the fact that socio economic status and workers educational level ecides their type and pattern of work.

lcohol use – health – sickness:

Vorkers who were ever users of alcohol had more sickness absenteeism compared to lifetime bstainers of alcohol. Current and former users of alcohol experienced more health problems hen compared with lifetime abstainers. This was consistent with the reports by M Upmark, Möller, and A Romelsjö, in 1999.[38] We have found that the association between alcohol use nd sickness absenteeism, was significant only among men, but there was no association mong women. This is similar to the findings reported by Marmot MG et al from the Vhitehall-II study.[37] Proportion of current use of alcohol was seen more among blue collar orkers and shift workers, when compared with their counter parts.

lore health problems among blue collar workers

lue collar workers experienced more health problems than white collar workers, among hich musculoskeletal problems (43.7%), gastro intestinal problems (30.5%), and ypertension (25.7%) was found to be high. This was consistent with reports by T Morken et l, in 2003.[40]. The proportion of hospitalization among blue collar workers was also found to

be high (10.2%) and blue collar workers had higher sickness absenteeism than white collar workers; they lost more number of days (21.5 days) due to sickness absenteeism when compared to white collar workers (11.9 days). [30] This was probably because the Blue collar work exposes the workers to harmful physical and chemical work environments, the interactions with the physical work environment and illness increases the risk of having health problems, mainly involving musculoskeletal system and respiratory system is high.[16 32] subsequently causing higher susceptibility to other health problems.[30]

Shift workers had more health problems

Shift workers experienced more health problems (P = 0.046) and hospitalizations (9.8%) than non-shift workers. The health problem included musculoskeletal problems (41.6%), gastro intestinal problems (29.5%) and hypertension (26%), and they lost more number of days (18.6 days) due to sickness absenteeism compared to regular workers (14.4 days). This could be due to the disturbances in the circadian rhythm.[42] and subsequent ill effects on cardiovascular system and gastro intestinal System [20].

We have found higher prevalence of gastrointestinal disorders, among blue collar workers and shift workers, and this was consistent with studies of Redmond CK, which concluded with high morbidities and mortalities due to gastrointestinal system among steel workers. The workers at high heat workplaces, experiences more problems due to cardiovascular and gastro intestinal problems. [44]

We have found that the workers who were working in work environments of having high grade of heat and noise had more sickness absenteeism. This was consistent with earlier studies by van Dijk FJ, et al in 1987. [46], Exposure to high heat at workplace negatively affects health and causes job dissatisfaction, post-work irritability, increase anxiety,

contributing to high sickness absenteeism. [61] Among health problems higher proportion of having musculoskeletal problems could be due to the fact that our study involved nearly half of the workers working in shift work (49%) and workers at blue collar jobs (47.3%).

Interestingly hypertension was found to be high among women workers (35.2%), while proportion of women working in shift works (13%) and blue collar jobs (13%) were less. The reason could be due to higher age of women in our sample (mean age 54.9 years). Women experience postmenopausal increase in blood pressure due to hormonal changes in their postmenopausal period. [82] This was found out by estimating age adjusted hypertension prevalence among men and women, which showed that 35.5 percent of the women with hypertension among those above 45 years compared to 20.3 percent of the men with hypertension among those above 45 years.

We have found similar proportions of injury among both men and women (10.2%), this was slightly high when compared with 9.3 percent of injuries reported by Ruta U and Loreta P from Lithuania.[47]. But they have reported this from a textile industry, and our study involved iron and steel industrial workers. Among the places of injury, workplace injuries were more experienced by men (52%), whereas, outside the workplace (63.6%) was common among women, this could be due to the fact that, more men were working at blue collar jobs and shift works than women. But the reasons for having more injuries outside the workspot among women need further investigation.

Workplace relations:

It was found that workers who had better relations with their superiors at work place were less likely to have sickness absenteeism compared to others. This could be due to the fact that psychosocial factors predicts the sickness absence at workplace level [56], and control over the

job, involvement in decision making at workplace, worker's attitude towards the work and concentration at job are influenced by workplace relations. [58]

Sickness absenteeism; self reported and recorded

We have made an effort to explore the reasons for sickness absenteeism, by inquiring into the reasons of sickness absence of workers from the **last 30 days**; this was to minimize recall bias from the participants. We have found that sickness (72.6%) as the most common cause for obtaining sick leave both among men and women. But the next reasons among men were social responsibilities, followed by family responsibilities. Among women it was family responsibilities followed by social responsilities (table 17). This is in accordance with the reports by Cost G of Italy, who reported that women have more family responsibilities and reproductive functions which make them vulnerable to avail more sick leaves than men. Here even though we have found very minimal difference between men and women for sickness absenteeism, we have found that the family responsibilities as the second most common reason for availing sick leave among women.

A reasonably good agreement of data comparison between recorded and self reported sickness absenteeism for 12 months duration was found by J E Ferri et al from Whitehall II study. It was observed in our study that those who reported to be having sickness absenteeism, had recorded sick leaves in the past 12 months. The possible differences in the recorded sick leaves (90.7%) and self reported sickness absence (66.9%), for the past 12 months was explained by the reasons of sickness absences enquired in the study, which revealed that, 72.6% of the sickness absences were due to sickness absences, and 3.4% due to injuries. Therefore a total of 75% of the sickness absenteeism was due to reasons of sickness

and injury, this reflects the differences observed between recorded and reported sickness absence for the past 12 months duration in our study. Another 25% were due to the reasons of social (13.5%) and family responsibilities (10%), which are closely linked with the predictors of health and sickness absenteeism of the workers.

From this study we have found that the sickness absenteeism is associated with physical characteristics such as having blue collar work and shift work, associated with psychological characteristics such as their relations with superiors at workplace, and social characteristics such level of education, alcohol use and socioeconomic status, of workers. Therefore sickness absenteeism is an 'integrated measure of physical, psychological and social functioning in studies of working populations' [3, 6]

6.2. Limitations of the study:

- Since permanent workers constituted the majority of the workforce in the industry, and our inclusion criteria involved workers who are working in the industry atleast since last one year, we could not explore the sickness absenteeism and factors associated with sickness absenteeism among contract workers / informal workers.

- Since most of the workers in the studied public sector industry, were residing in quarters provided by the industry, we could not explore relation of sickness absenteeism and its factors with housing and water sanitation facilities of the workers.

Chapter 7

Conclusions:

- Sickness absenteeism among industrial workers in this study was higher compared to published data from other parts of India.
- Blue collar workers and shift workers experienced more health problems than white collar workers, particularly related to musculoskeletal system and gastro intestinal system.
- Workers with lower level of education experienced more health problems and reported more sickness absenteeism
- Alcohol use was associated with more health problems among men.
- Poor relationship with superior workers was one of the predictors of sickness absenteeism

Recommendations:

- Efforts should be made to reduce alcohol consumption, and improve the relationships with superior workers in order to reduce the sickness absenteeism.
- Regular efforts should be there to detect and address health problems experienced by workers, focusing blue collar workers and shift workers

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Informed Consent Form

I am Dr.Manjunatha.R. MPH Scholar from Sree Chitra Tirunal Institute for Medical Sciences & Technology (SCTIMST), Trivandrum, a Government institute in Kerala. As a part of my MPH course requirement, I am conducting a study on factors associated with Sickness Absenteeism among Industrial Workers. The purpose of this research is to study the health conditions of industrial workers. I have taken permission from the authorities at Visvesvaraya Iron & Steel Plant (VISP), Bhadravathi to conduct interviews among workers in VISP industry. If you consent to participate in the study, I would like to interview you for about 25 to 30 minutes. Similarly I will be interviewing other 350 participants in VISP industry. While you yourself may not benefit directly from this study, the findings obtained by conducting this study may benefit the public health programs, as a whole. Your identity and the information given by you will be analyzed by myself alone for research purposes only. No individual information will be provided to the management and effort will be made not to reveal details that will help group identification. If you do not want to answer any question or series of questions, you can refuse to say at any point in time. If you want to know any further information regarding this study you can contact Head of the Department, Achutha Menon Centre for Health Science Studies (AMCHSS), SCTIMST, Trivandrum at phone number 0471-2443152.

Would you be willing to participate in this research project?

Yes ☐ No ☐

Signature of the participant Signature of the investigator

Section A: General Information

A.1: Personal Information: -

1. Sex: -

	Response	Coding
Male		1
Female		2

2. Age: -_____(in Completed Years)

3. Level of Education: -

	Response	Coding
No Formal Education		1
Primary Education		2
Secondary Education		3
Graduate		4
Post Graduate		5

4. Residence: -

How far is your Residing Home from your Industry?

	Response	Coding
<5 kms		1
5-10 kms		2
>10 kms		3

5. Marital Status: -

	Response	Coding
Single		1
Married		2
Separated		3
Divorced		4
Widow/widower		5
Others (specify..)		6

6. Number of Dependents in the Household _____
(Non-earning members of the household)

7. Type of family: -

Nuclear		1
Extended		2
Joint		3

8. What is your Average monthly salary?

	Response	Coding
<=5000		1
5001-10000		2
10001-15000		3
15001-20000		4
>=20001		5

A.2: Tobacco Use information: -

A.2.1: Smoking: -

9. Have you Ever smoked any tobacco products? (Such as Beedis, Cigarettes, any others)

(Ever Smoker)

	Response	Coding
Yes		1
No		2

(If, No, then go to Next Section)

10. If yes, do you currently smoke any tobacco products? (Beedis, Cigarettes, any others)

(Current Smoker)

	Response	Coding
Yes		1
No		2

11. How old were you when you First Started smoking?

Age (in Years) ☐☐

Don't Remember ☐

12. Do you remember how long ago it was?

In years ☐☐

OR
In months ☐☐
OR
In weeks ☐☐

13. On average, how many of the following do you smoke each day?

Beedis	
Cigarettes	
Any others	

14. If No, When did you Stop Smoking?

(Former Smoker)

	Response	Coding
Stopped since less than 1 year		1
Stopped since, More than 1 year		2

A.2.2: Smokeless Tobacco Use information: -

15. Have you Ever used any Smokeless form of Tobacco? (Such as snuff, betel, Ghutka, Kahaini, chewing tobacco)

(Ever User)

	Response	Coding
Yes		1
No		2

(If, No, then go to Next Section)

16. If Yes, Do you currently use any smokeless forms of tobacco? (Such as snuff, betel, Ghutka, Kahaini, chewing tobacco)

(Current User)

	Response	Coding
Yes		1
No		2

17. How old were you when you First Started using smokeless form of tobacco?

Age (in Years) ☐☐

Don't Remember ☐

18. Do you remember how long ago it was?

In years ☐☐

OR
In months ☐☐

☐☐

19. On average, how many times a day do you use……

Snuff	
Betel	
Ghutka	
Kahaini	
Chewing tobacco	

20. If No, When did you stop using?

(Former User)

	Response	Coding
Stopped since less than 1 year		1
Stopped since, More than 1 year		2

A.3: Alcohol Use information: -

21. Have you ever consumed any drink that contains alcohol such as beer, whisky, rum, gin, brandy or other local products?

(Ever User)

	Response	Coding
Yes		1
No		2

(If, No, then go to Next Section)

22. If yes, have you consumed alcohol with in the past 12 months?

(Current User)

	Response	Coding
Yes		1
No		2

23. How old were you when you First Started using alcohol?

Age (in Years) ☐☐

Don't Remember ☐

24. Do you remember how long ago it was?

In years ☐☐

OR
In months ☐☐

☐☐

25. Frequency and Intensity of Alcohol Use: -
Here are 10 questions regarding your Alcohol Using pattern, please select one of the 5 options given in front of each of the questions; -

(AUDIT Screening test for Alcohol Use)

	Questions	0	1	2	3	4	
25.1	How often do you have a drink Containing alcohol?	Never	Monthly or less	2 to 4 times a month	2 to 3 times a week	4 or more times a week	
25.2	How many drinks containing alcohol do you have on a typical day when you are drinking?	1 or 2	3 or 4	5 or 6	7 to 9	10 or more	
25.3	How often do you have 5 or more drinks on one occasion?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily	
25.4	How often during the last year have you found that you were not able to stop drinking once you had started?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily	
25.5	How often during the last year have you failed to do what was normally expected of you because of drinking?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily	
25.6	How often during the last year have you needed a first drink in the morning to get yourself going after a heavy drinking session?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily	
25.7	How often during the last year have you had a feeling of guilt or remorse after drinking?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily	
25.8	How often during the last year have you been unable to remember what happened the night before because of your drinking?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily	
25.9	Have you or someone else been injured because of your drinking?	No		Yes, but not in the last year		Yes, during the last year	
25.10	Has a relative, friend, doctor, or other health care worker been concerned about your drinking or suggested you cut down?	No		Yes, but not in the last year		Yes, during the last year	
						Total	

26. If No, When did you stop using?

(Former User)

	Response	Coding
Stopped since less than 1 year		1
Stopped since, More than 1 year		2

Section B: Work place information

B.1: Shift Work information: -

27. Do you have shift work in your work Schedule?

	Response	Coding
Yes		1
No		2

(If, No, then go to Next Section)

28. If yes, then what is the Average duration for which working/worked in the shift work?

Average Duration for which worked/working in Shift work (in Yrs)

	Response	↓	Coding
Yes, Presently			1
Previously, not now			2
Started Recently (< 1 year)			3

29. If yes, How often you get shift work in a week?

	Response	Coding
Less than 3 days a week		1
More than 3 days a week		2
Regularly on Shift work		3

B.2: Work Duration information: -

30. Since how long are you working in this industry?

_____Years _____Months

31. What was your Previous Occupation, before joining this industry?

	Response	Coding
None		1
Same		2
Other, Please Specify		3

B.3. Work Pattern information: -

32. What is the type of your work?

(Blue-collar works include working at production sites, furnaces, plants, etc
White-collar works includes working at office side and service side)

(Department of Work_____)

	Response	Coding
Blue Collar Work		1
White Collar Work		2

B.4: work Environment information; -

33. Please show do you feel about each of these 7 characteristics at your workplace

		1	2	3	4
		High	Moderate	Less	Not at all
24.1	Heat				
24.2	Noise				
24.3	Unsafe				
24.4	Dusty				
24.5	Vibration				
24.6	Physically Stress				
24.7	Mentally Stress				

B.5: Work place Relations: -

B.5.1: Work place Relations (Co-workers): -

34. Below are 5 statements regarding your relations with your co-workers/colleagues at your workplace. Show how do you agree with each of these following 5 statements at your work place

Statement	Strongly Agree (1)	Agree (2)	Disagree (3)	Disagree Strongly (4)
I have an influence over the things that happen to me				
I am satisfied with the amount of involvement I have in decision making				
I am satisfied with the fairness and respect I receive from my colleagues				
I have no conflicts with my colleagues in the last one year				
On the whole, I like My job				

B.5.2: Work place relations (Managers & Supervisors): -

35. Below are 5 statements regarding your relations with your Supervisors/Managers at your workplace. Show how do you agree with each of these following 5 statements at your work place

Statement	Strongly Agree (1)	Agree (2)	Disagree (3)	Disagree Strongly (4)
I am satisfied with the response I receive from my managers/supervisors				
My supervisors/managers have a sincere interest in the well being of employees				
I am satisfied with the fairness and respect I receive from my managers/supervisors				
I have no conflicts with my supervisors/managers in the last one year				
I feel I am rewarded well for the level of efforts I put in for my job				

Section C: Health information

C.1. Health Conditions: -

36. Have you had any of the following health problems diagnosed or treated by a doctor in the last one year?

Conditions	Response	Coding
Respiratory diseases		1
Cardiovascular diseases		2
Neurological disorders		3
Gastrointestinal disorders		4
Obstetrical Problems		5
Gynecological Problems		6
Hypertension		7
Diabetes		8
Cancer		9
Stroke		10
Asthma		11
Skin Diseases		12
Dental ailments		13
Mental disorders		14
Musculoskeletal Problems		15
Eye problems		16
ENT problems		17
Any Others		18
None		99

C.2: Hospitalization information: -

37. Were you hospitalized in the last one-year?

	Response	Coding
Yes		1
No		2

38. If Yes, How many days were you hospitalized in the last one-year?

_____Days

Section D: Sickness Absenteeism information

D.1. Sickness Absence information: -

39. Did you miss any working day due to sickness in the last one-year?

	Response	Coding
Yes		1
No		2

40. If yes, how many days you were unable to work due to sickness in the last one year?

_____Days

41. Did you miss any working day due to injury in the last one-year?

	Response	Coding
Yes		1
No		2

42. If yes, the injury was on work or outside the work in the last one year?

	Response	Coding
Injury on work		1
Injury outside the work		2
Had Both		3

43. If yes, how many days you were unable to work due to injury in the last one-year?

	Number of days unable to work
Injury on work	
Injury outside the work	
Total days lost due to injury	

D.2 Sickness Leave information: -

44. Did you take any sick leave in the last one-year?

	Response	Coding
Yes		1
No		2

45. If Yes,

How many days	
How many Spells	
Don't Know	

46. Did you take any Sick Leave in the last one-month?

	Response	Coding
Yes		1
No		2

47. If Yes, then please select the reason from the following, which led you to take the leave on that day

	1st spell	2nd spell	3rd spell	No. Of Days	Coding
Due to Sickness					1
Due to Injury					2
Due to Family Responsibilities					3
Due to Social Responsibilities					4
Due to Pregnancy & related complications					5
Abortion					6
Gynaecological problems					7
Others (please specify)					8