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Sickness Absenteeism, Morbidity and Workplace Injuries among Iron and Steel workers – A Cross Sectional Study from Karnataka, Southern India

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RESEARCH

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Abstract

Background

The study of illnesses causing absence of workers from work in industries is a practical method to study the health status of industrial workers and to identify occupational health hazards. The iron and steel industries are particularly hazardous places of work. Published data from India on health status of iron and steel workers is limited, therefore this study was undertaken to investigate the sickness absenteeism, morbidity and workplace injuries among this population.

Method

Workers were selected using stratified random sampling. A structured pre-tested interview schedule was used to collect the data. A p value of < 0.05 was considered for statistical significance.

Results

From a total of 2525 workers, 353 (mean age 55.1 yrs, male 69.4%) participated in the study. The overall proportion of sickness absenteeism was 66.9% (95% CI: 0.62 – 0.71). 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 < 0.01). Among workers, health ailments related to the musculoskeletal system (31.4%), gastrointestinal system (25.8%), hypertension (24.4%), respiratory system (18.1%) and other minor ailments (19.3%) were found to be high.

Conclusion

Sickness absenteeism is significantly higher among iron and steel workers when compared to other occupations in India. Blue collar workers and shift workers loose higher number of days due to sickness absence, and they face problems related to musculoskeletal system, gastrointestinal system and hypertension in higher proportions compared to their counterparts. Women experienced hypertension as the common health problem and higher proportions of injuries outside the work environment.

Key Words

Sickness absence, industrial workers, Karnataka, morbidity

Background

The study of illnesses absence of workers in industry is a useful proxy for the health status of such employees and helps to identify occupational health hazards. The health of workers is important in determining the ability of employees to maintain productivity. Injuries at the workplace and high sickness absences will impact on the well being of workers.[1]

The iron and steel industries have foundries consisting of oven and furnaces, which involve heat, noise, vibration, and dusty environments. Therefore iron and steel workers are especially prone to occupational health problems and experience more sickness absenteeism.[2, 3]

Since published data from India on the health status of workers in iron and steel industries are limited, this study was undertaken to study the morbidity and workplace injuries related to sickness absenteeism

Method

The ethical review board of Sree Chitra Tirunal Institute for Medical Sciences and Technology (SCTIMST), Thiruvananthapuram approved the study. The study was conducted at a public sector industry in Karnataka, after obtaining a written permission from the management of the industry. Expected proportion of sickness absenteeism is taken as 60%, from the available relevant Indian studies; [4, 5] a sample size of 375 was estimated with 99% confidence limits and 80% power of test. Workers were selected using stratified random sampling. Stratification was done between men and women to have an equal representation in the sample.

A structured pre-tested interview schedule was used to collect the data. Record review was undertaken in order to study the health facilities provided at the industry following a health event or an injury, and to match the data with reported sickness absences due to health events and workplace injuries. Health events were categorized into - musculoskeletal, gastrointestinal, cardiovascular, respiratory, gynecological, dental, neurological, ENT (Ear, Nose, Throat), eye and psychological-related problems. Informed consent was obtained from all the participants. The analysis was done using SPSS software applying appropriate statistical methods

Results

From a total of 2525 workers, 375 workers were selected. With a response rate of 94.1 %, 353 (male 69.4%) industrial workers participated in the study. The mean age of participants was 55.1 years (Male=55.2 and Female=54.9). A breakdown of participants' work pattern and type of work is given in Table 1.

Morbidity among workers:

Worker's health events in the past 12 months were obtained; 81% said that they experienced at least one health event in the past 12 months. Of these, the most frequent were those related to the musculoskeletal system (31.4%), gastrointestinal system (25.8%), hypertension (under the cardiovascular system) (24.4%) and respiratory system (18.1%). Further details of health events are shown in Table 2

Men experienced health problems related to musculoskeletal system (35.1%) and gastrointestinal system (29.8%) the most, whereas women experienced hypertension (35.2%) as the most common health problem in the past 12 months.

Table 1: Type of work

		Male		*Female*		*Total*	
		n	***%***	***n***	***%***	***N***	***%***
Work pattern	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

Table 2: Common health problems experienced

	Male		*Female*		*Total*	
	n 245	***%***	***n 108***	***%***	***N 353***	***%***
Musculoskeletal problems	86	35.1	25	23.1	111	31.1
Gastrointestinal 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

Health problems according to type of worker:

Among blue collar workers health problems related to musculoskeletal system (43.7%), gastrointestinal system (30.5%) and hypertension (25.7%) were found to be high whereas among white collar workers hypertension (23.1%) was found to be high. The comparison of health problems is shown in Table 3.

Table 3: Health Problems among blue and white collar workers

	Blue Collar		*White Collar*		*Total*	
	n 167	***%***	***n 186***	***%***	***N 353***	***%***
Musculoskeletal problems	73	43.7	38	20.4	111	31.1
Gastrointestinal 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

Health problems among Shift and Regular workers:

Shift workers most commonly experienced problems related to musculoskeletal system (41.6%), gastrointestinal system (29.5%) and hypertension (26%). Regular workers experienced problems of gastrointestinal system (22.2%) and hypertension (22.8%) as the most common illnesses in the past 12 months. The comparison is shown in Table 4

Table 4: Health problems comparison among regular and shift workers

	Shift worker		*Regular Worker*		*Total*	
	n 173	***%***	***n 180***	***%***	***N 353***	***%***
Musculoskeletal problems	72	41.6	39	21.7	111	31.1
Gastrointestinal 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

Hospitalizations:

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 5

History of hospitalization was found high among blue collar workers when compared with white collar workers, Shift workers were having a higher proportion of hospitalization when compared to regular workers

Table 5: Hospitalizations and Workplace Injury:

		Hospitalized		*Total*
		N	***%***	***(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

Thirty-six (10.2 %) workers had experienced injuries in the past 12 months. The proportion of injury was found to be equal among male and female workers (10.2%) in the past 12 months. When the place in which the injury was sustained was considered, 52% of injuries among men and 27.3% among women were at the worksplace, the distribution of place of injury is shown in Table 6.

Table 6: Place of injury

Place of Injury	*Male*		*Female*		*Total*	
	n	***%***	***n***	***%***	***N***	***%***
At work	13	52.0	3	27.3	16	44.4
Outside 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

Sickness absences:

Among the participants 66.9% of workers missed atleast a working day due to the reasons of sickness or injury in the past 12 months, and the distribution among men and women is shown in Table 7. A small proportion of workers (4.2%) said that they couldn't recall about their sickness absence history of past 12 months

Table 7: Sickness absenteeism

Sickness absenteeism	*Male*		*Female*		*Total*	
	n	***%***	***n***	***%***	***N***	***%***
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

Man - days lost per worker per year:

Overall 16.4 days were lost per worker per year (male = 16.5 & female = 16.2) due to sickness absence (see Table 8). A blue collar worker lost 21.5 days compared to 11.9 days by a white collar worker ($p < 0.01$).

Table 8: Number of workdays lost per worker per year

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

Discussion

This study estimated 66.9% (men = 66.1% and women = 68.5%) of sickness absenteeism among 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. [4, 5] The higher prevalence in this study could be due to the nature of the work that the study participants were involved in, as the iron and steel industry is believed to be a more hazardous place of work, resulting in higher sickness absenteeism, than other industries.[6, 7]

Health problems among blue collar workers:

Blue collar workers experienced more health problems than white collar workers, among which problems related to musculoskeletal system (43.7%), gastrointestinal system (30.5%), and hypertension (25.7%) were found to be high. This was consistent with reports by Morken et al in 2003.[8] 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 working days (21.5 days) due to sickness absenteeism when compared to white collar workers (11.9 days). Workers in Blue collar work are exposed to harmful physical and chemical work environments [9]; which increases the risk of having health problems, mainly involving musculoskeletal system and respiratory system, [10] subsequently causing higher susceptibility to other health problems and resulting in higher sickness absences. [9]

Shift workers and health problems:

Shift workers experienced more health problems ($P<0.05$) and hospitalizations (9.8%) than non-shift workers. The health problems related to musculoskeletal system (41.6%), gastrointestinal system (29.5%) and hypertension (26%) were found to be high, and they lost higher 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, [11] and subsequent ill effects on cardiovascular system and gastrointestinal system among shift workers[12].

Hypertension among women:

Interestingly, hypertension was found to be proportionally higher among women (35.2%). This could be due to the higher age of women in our sample (mean age 54.9 years). Women can experience postmenopausal increases in blood pressure due to hormonal changes at this time.[13] This hypothesis was further supported by estimating the age-adjusted hypertension prevalence among men and women, which showed that 35.5% of the women with hypertension among those above 45 years compared to 20.3% of the men with hypertension among those above 45 years ($P<0.05$).

Workplace Injuries:

We have found similar proportions of injury among both men and women (10.2%). When we considered the place in which injuries were sustained, 52% of injuries among men and 27.3% of injuries among women were at the workplace. This could be due to the fact that, more men were working at blue collar jobs and shift works than women. But the reason for having more injuries outside the workplace (63.6%) among women cannot be explained and needs to be studied further.

Conclusion

Sickness absenteeism is high among iron and steel workers when compared with other published data from India. Blue collar workers and shift workers loose significant number of days due to sickness absence, and they face problems related to musculoskeletal system, gastrointestinal system and hypertension in higher proportions than others. Women experienced hypertension as a common health problem and experienced higher number of injuries, this needs to be studied further.

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PEER REVIEW

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CONFLICTS OF INTEREST

The authors declare that they have no competing interests.

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