original article

Evaluation of physical health and its relation with history of work accidents in workers of the Central Iron Ore Company of Iran

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ABSTRACT

Aims: This study was conducted to determine the state of physical symptoms of the Iranian Central Iron Ore Company workers and its relation with history of work accidents.

Materials and Methods: This cross-sectional descriptive study was performed at the Iranian Central Iron Ore Company and included 388 workers sampled randomly out of 2100 workers. Research tool was a two-part questionnaire that its reliability was determined by some of researchers. Data was analyzed by SPSS (Statistical Package for Social Science) software and statistical tests included variance analysis and Pearson' correlation tests.

Results: According to the findings, 80.9% had favorable physical health conditions and there was a significant relationship between physical health condition, history of work accidents, cigarette smoking and type of work.

Conclusion: Considering the strong relationship between physical health and history of work accidents, it is proposed that high-level managers of the Central Iron Ore Company of Iran should pay special attention to the improvement of physical health, psychological, social, and welfare levels.

Key words: Central Iron Ore Company of Iran, occupational accidents, physical health

INTRODUCTION

Physical health plays an important role in the individual and social life and lack of attention to this important factor leads to decrease in performance, loss of manpower and psycho-physical complications, especially in professional services.[1]

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It is important to pay attention to the physical and mental aspects of health in all spheres of life, including ones work life. Work factors are extensively associated with the health of employed people and the international work organization reports that one out of three employees have a conflict between his work and family environment.[2]

According to WHO (World Health Organization) statistics, 3 million workers in the world lose their lives every year due to various diseases and work accidents. In Iran, this problem is remarkable. In the national study of health and disease in Iran using the General Health Questionnaire GHQ-28, the rate of disorders in the population older than 15 years was reported to be 12%.[3]

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There is no doubt about the effects of professional health on the psychological and physical health of workers that is confirmed by various researches. As mining work conditions are severe, this topic gains more significance. Furthermore, the small and dark surroundings, long distance between mines and cities and lack of communication facilities makes mining work conditions severe and health threatening.[4] According to the results of a study in one of the Iranian mines, 25% of mine workers do not have appropriate physical health conditions.[5]

Studies show that psycho-physical factors affect day to day work and can impose economical losses on society. It affects the implementation, progress or continuation of a process or work and even results in work accidents.[6]

A study on workers of the Medical Treatment and Education Center showed that only 5.7% of the workers had physical health problems.[1] However, literature review shows a significant relationship ($P < 0.05$) between physical health status and accidents.[5,7]

Considering the above mentioned points, mine workers are one of the most vulnerable workers in mining and industrial sectors.

The aim of the present study was the evaluation of the physical state of the workers of the Central Iron Ore Company of Iran along with its relation to type of job, education level, cigarette smoking and history of work accidents.

MATERIALS AND METHODS

This was a descriptive, cross-sectional study that included 388 mine workers in the Central Iron Ore Company of Iran. The samples were selected randomly out of 2100 mine workers. Research tool was a two part GHQ questionnaire. The first section of the questionnaire was related to the demographic characteristics of the workers and included age, type of job, work experience, marital status, cigarette smoking, job satisfaction level, consent of the employer, work shift, income level satisfaction and work accidents.

The reliability and validity of both sections of the questionnaire were determined by specialists (Cronbach's alpha coefficient was 0.83).[5]

The questionnaire evaluated the physical symptoms of the individual in the past month. As most of the workers had low education levels, the questionnaire was filled by the assistance of researcher. Simple Likert scale was used for scoring and each answer was scored between 0 and 3.

SPSS (Statistical Package for Social Science) program was used for analysis and statistical tests included variance analysis and Pearson correlation tests. Individuals with a total score of less than 7 were considered ideal, 7-14 average and those with scores above 14 as a bad physical condition.

RESULTS

The present study was performed on 388 workers of the Central Iron Ore Company of Iran, out of which 10.6% were single and 89.4% married. Other statistics were as follows: 22.9% smokers, 77.1% non-smokers, 13.9% were highly satisfied with their work, 42.3% satisfied, 34.8% relatively satisfied, 9% not satisfied, 30.4% morning shift workers, 1.3% night shift, 65.2% rotational shift workers, and 2.3% morning and evening shift workers. The demographic characteristics of the workers are presented in Table 1.

According to Table 2, only 1% of the studied population had a bad physical condition, while 80.9% had good physical health conditions and 18% were in average conditions.

Table 3 shows the results of the 7 questions related to physical health.

84.5% of the studied population had no history of work accidents in the past 3 years and 15.5% had suffered from at least one accident in the past 3 years, 50% of which included falls, fall of stones and explosions (16.6%, 3.4%, and 30%), respectively.

According to the Table 4, mine workers are at a greater risk of physical health problems as compared to other jobs and the

Table 1: Demographic factor of Iran Central Iron Ore company workers

	N (%)
Age (years)	
17-29	163 (42)
30-39	(43) 167
40-57	58 (14.9)
Type of work	
Miner	90 (23.2)
Technician	98 (25.3)
Transportation	61 (15.7)
Office	94 (24.2)
Manger	34 (8.8)
Other	11 (2.8)
Work experience	
Less than 6 years	109 (28.1)
6-14 years	160 (46.2)
More than 14 years	119 (30.7)
Educational level	
Primary school	45 (11.6)
Middle school	108 (27.8)
High school	167 (43)
Academic education	68 (17.5)

Table 2: Physical health condition score of Iran Central Iron Ore company workers

Physical condition scores	*N* (%)
Under 7	314 (80.9)
7-14	70 (18)
More than 14	4 (1)
Total	388 (100)

Table 3: Physical health condition score of Iran Central Iron Ore company workers

Physical health according to GHQ	No		Low		High		Very high	
	N	%	*N*	%	*N*	%	*N*	%
Good and healthy	36	9.3	268	69.1	65	16.8	19	4.9
Need of injectable medications	345	88.9	37	9.5	4	1	2	7
Weakness and asthenia	219	56.4	126	32.5	32	8.2	11	2.8
Feel sick	227	58.5	123	31.7	26	6.7	12	3.1
Headache	149	38.4	184	47.4	41	10.6	14	3.6
Head pressure	247	70.6	92	23.7	13	3.4	9	2.3
Feeling hot and cold	231	59.5	126	32.5	23	5.9	8	2.1

GHQ: General health questionnaire

relationship between the type of work and physical health was statistically significant ($P < 0.05$).

61.7% of the smokers and 74% of the non-smokers had good physical health condition and there was a significant relationship between physical health and cigarette smoking ($P < 0.003$) [Table 5].

Table 6 shows that those with a history of work accidents, only 13.1% had appropriate physical health conditions, while 86.9% of those without history of work accidents had good physical health condition. The relationship between history of work accidents and physical health was significant ($P = 0.02$).

DISCUSSION

This study showed that 18% of the population under study had some kind of physical health problems. The results of another study indicates that 26.7% of the women workers complained of physical health problems.[8] The difference could be due to the fact the study sample included women in that study, while the mining workers in the present study were men and the results of various studies show that women workers suffer from relatively more problems because of their natural physical restrictions.[9] A study showed that work burnout in men is more than women that is confirmed by the other studies.[8,10]

The results of the present study showed that physical health problems in mine workers are more than other occupations because of work conditions and high levels of fatigue in this company[11] and are in line with the results of the Wessely study.[12]

In a study, it was determined that there is a significant relationship between parent's occupation and general physical health of students. It was concluded that low-income and hard work job employees cannot afford to meet welfare needs of the family as compared to higher-income jobs, thus this issue leads to psychological and physical problems of the workers family member.[13] This is in line with the results of the North American study wherein psychological and physical problems in the Canadian population with higher standards of living are comparatively less.[14]

Table 4: Relationship between physical health and type of work in Iran Central Iron Ore company workers

Type of work	Physical health				Total	
	Good health		Unhealthy			
	N	%	*N*	%	*N*	%
Miner	69	76.7	21	23.3	90	100
Technician	81	82.7	17	17.3	98	100
Transportation	50	82	11	19.7	61	100
Office	76	80.9	18	19.7	94	100
Manger	28	82.4	6	17.6	34	100
Other	10	90.9	1	9.1	11	100
Total	314	80.9	74	19	388	100

Significant relationship between physical health and type of work ($P<0.05$)

Table 5: Relation between physical health and smoking in Iran Central Iron Ore company workers

Smoking	Physical health subscale						Total	
	Good health		Average health		Unhealthy			
	N	%	*N*	%	*N*	%	*N*	%
Yes	55	61.8	26	29.2	8	9	89	100
No	221	73.9	72	24.1	6	2	299	100
Total	276	71.7	98	25.3	14	3.6	388	100

Significant relationship between physical health and smoking ($P=0.003$)

Table 6: Relation between physical health and history of work accidents in Iran Central Iron Ore company workers

Physical health	History of work accidents				Total	
	Yes		No			
	N	%	*N*	%	*N*	%
Good health	39	13.1	258	86.9	297	100
Unhealthy	21	23.1	7.	76.9	91	100
Total	60	15.5	328	84.5	388	100

Significant relationship between physical health and accident ($P=0.02$)

Khaghanizadeh states that there is no relationship between the economy and livelihood situation and their physical factors,[15] but the study concludes that there is a significant relationship between type of job and burnout with physical and psychological health.[7] The result of the study by Danesh is also in line with our results.[5]

The results of the present study showed there is a significant relationship between cigarette smoking and physical health that is in agreement with the results of the study by Suda that states lifestyle including cigarette smoking and alcohol consumption has a significant effect on physical health.[16] The study by Corti

and coworkers concluded that the health of smokers is in more serious condition as compared to non-smokers and there is a significant statistical relationship between cigarette smoking and physical health.[17] Another study states that high stress works leads to cigarette and alcohol abuse thus deteriorating physical health and leading to physical damage. It concludes that cigarette smoking is related to physical complications.[18,19]

The results of the present study showed that there is a relationship between history of work accidents and physical health. As stated earlier, the physical and psychological health of mine workers is at a greater risk as compared to other workers due to a number of reasons, the most important being in high-stress conditions, workload, organizational and individual factors. Physical problems like pain and fatigue lead to increase in work accidents.[11,20] Considering the high levels of stress, physical and psychological disorders in mining work as compared to the general population,[5,21] work burnout, especially in younger and inexperienced workers[7] and strong relation between physical health and history of work accidents. It seems there is a need for higher level occupational health and work authorities of the Yazd, Bafgh district and managers of the Central Iron Ore Company of Iran to pay special attention to both pre-recruitment and regular physical examinations of workers in order to prevent or remove the present problems of workers and increase their physical, mental and social health levels.

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