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Analysis Effect of Psychological Factors on Work Productivity in Iron and Steel Industry

Alamulyaqin Romadloni[1], Mirna Apriani[2], Indri Santiasih[3*]

[1,2,3]Department Safety and Risk Analys, Surabaya State Shipping Polytechnic, Surabaya, Indonesia
e-mail: indri.santiasih@ppns.ac.id

Abstract

The processing of iron and steel requires a heating temperature of up to 900 degrees Celsius. Psychological factors will have an impact on work productivity and make workers very uncomfortable. We involved 15 respondents in the area of the short taper and eye forming process and tested the work environment and conducted a stress level survey on the respondents. The results of the analysis above measuring psychological factors on 15 respondents, the Shearing Process section (Taper and Eye Forming) found that the 6 triggers of work stress were within moderate limits (10-24). With the most dominant aspect of potential stress, namely Qualitative Overload. It is necessary to add hours of rest for workers to control the level of work stress in workers.

Keywords: *psychological factors, shearing process, work productivity*

INTRODUCTION

Iron and steel industry companies received quite significant orders from domestic and foreign customers after going through the Covid-19 pandemic. Enhancement in orders also has impact on need manpower and workload increasing to meet customer needs. One of company target is output production tonnage 8500 tons per month. Operational work environment also quite hot because iron and steel processing requires heating temperature up to 900 degrees Celsius. Effect of increasing stress level of workers and working environment conditions that make workers very uncomfortable. Both in terms noise levels, heat exposure, and manual handling. Previous studies have used the Indirect Assessment Method to classify physical (physiological) workload, pulse (beats per minute), cardiovascular load (CVL) percentage, calculate energy consumption, and predict the necessary amount of rest time (Hidayat et al., 2020).

One of the most frequent health risks at work is noise. One of the most important consequences of noise is the measured mental reaction caused by distraction. The degree of annoyance caused by background noise can be impacted by a variety of non-acoustic elements, including attitudes, personality qualities, and hearing sensitivity. The aim of the research is to ascertain how hearing conservation education affects noise disturbance programs for employees in the iron and steel industry (Shabani et al., 2020).

One of the physical risks that can lead to health issues at work is heat. The most significant and frequent occupational health issue at work is the impact that unsuitable temperatures can have on employee well-being and outpu (Krishnamurthy et al., 2017).

Heat stress from building, industrial operations, and global warming can raise local temperatures by several degrees. It can also regularly expose individuals to heat levels over standard limits in industries subject to regulations, such as mining, steel, chemical environments, and ceramics (Afshari & Shirali, 2019).

Constant muscular contraction is a characteristic of static labor. Static labor often results in muscular exhaustion and is not linked to significant metabolic demands. dynamic labor defined by strong arm and leg movements and regular muscular contractions. Dynamic labor is linked to higher metabolic needs, external job performance (using force over extended distances), and overall body tiredness (Eastman & Company, 2004).

Physical factors will determine amount of production. during physical work process employees will expend energy so in order for production process to remain optimal, it necessary balance between expenditure and energy recovery. Factors that affect energy recovery include rest time, rest period, and rest frequency. Fatigue can be divided into two, namely physiological fatigue and psychological fatigue. Physiological fatigue is fatigue that arises due to changes in body physiology, while psychological fatigue is fatigue that arises due to mental workloads such as stress, psychological disorders, or pressure that results in psychological disturbance (Hidayat et al., 2020).

From this perspective, it believed that productivity correlated with availability of human resources, and human capital related to knowledge, skills, and talents possessed by employees (Lackie & Tomblin Murphy, 2020). For many work, it impractical to maintain performance standards or productivity levels using approach described in this article. There are some works where time studies, standardized data, and previously established but no longer useful time standard exist. There is productive method to update standard (Hill, 2004).

METHODOLOGY

We carry out field studies by collecting primary data directly on object to be discussed, namely level of work stress. This stage helps researcher to identify potential related hazards so as to deepen researcher's knowledge.

We use Job Stress Diagnostic Survey Questionnaire (Tabel 1) designed to determine extent which various work conditions source of stress for workers.

Respondents were asked to choose how often these conditions cause stress.

1. If the conditions described never cause stress
2. If the conditions described rarely cause stress
3. If the conditions described rarely cause stress
4. If the conditions described sometimes cause stress
5. If the conditions described often cause stress
6. When the conditions described often cause stress
7. If the conditions described always cause stress

- Score of 9 indicates a SLIGHT stress risk.
- Score between 10 and 24: MODERATE stress
- Score > 24: VERY HIGH risk of stress

The main instrument collecting data in this study to provide structured questions (questionnaires) which are distributed to respondents. Accordance with Minister of Labor's Order No. 5 of 2022, Questionnaire questions use scaled response question, which form of question that uses scale to measure and determine respondents' attitudes towards questions about research conducted. Statements in questionnaire were measured using Likert scale, scale used for work ethic, work environment, organizational commitment, and employee performance.

Tabel 1 Job Stress Diagnostic Survey Questionnaire

No	**Questionnaire Items**	**Stress Condition Value**						
1	My tasks' and work's objectives are unclear	1	2	3	4	5	6	7
2	I undertake pointless chores or initiatives	1	2	3	4	5	6	7
3	Every evening or weekend, I have to bring work home in order to catch up	1	2	3	4	5	6	7

4	I thought the requirements for the caliber of the job were absurd	1	2	3	4	5	6	7
5	This firm doesn't provide me enough opportunities to advance	1	2	3	4	5	6	7
6	I am in charge of other employees' professional growth	1	2	3	4	5	6	7
7	I'm not sure who I should report to or who should report to me	1	2	3	4	5	6	7
8	My top and bottom met in the center, and I was there	1	2	3	4	5	6	7
9	I take up too much of my time with unnecessary meetings	1	2	3	4	5	6	7
10	The duties given to me are too challenging or intricate	1	2	3	4	5	6	7
11	Finding work in another work unit is necessary for me to advance in my career	1	2	3	4	5	6	7
12	I am in charge of directing and/or assisting my subordinates in resolving their issues	1	2	3	4	5	6	7
13	I lack the power necessary to do my work duties	1	2	3	4	5	6	7
14	There was no official chain of command in place	1	2	3	4	5	6	7
15	I am in charge of all job tasks at once, which is practically out of control	1	2	3	4	5	6	7
16	The chores appear to be getting more difficult	1	2	3	4	5	6	7
17	I don't think remaining at this company will assist me in advancing my career	1	2	3	4	5	6	7

18	I do actions or make choices that compromise safety and welfare	1	2	3	4	5	6	7
19	It's unclear to me exactly what is expected of me	1	2	3	4	5	6	7
20	I produce art that is appreciated by some people but not by others	1	2	3	4	5	6	7
21	There is actually more work than I can handle in a day	1	2	3	4	5	6	7
22	The company anticipates that I will perform above my ability or expertise	1	2	3	4	5	6	7
23	In my profession, I seldom get the chance to grow and acquire new information and abilities	1	2	3	4	5	6	7
24	My duties at this company are more focused on people than objects	1	2	3	4	5	6	7
25	I'm not sure how my job contributes to achieving the larger company goals	1	2	3	4	5	6	7
26	I get contradictory demands from a few different folks	1	2	3	4	5	6	7
27	I believe I don't have enough time for frequent breaks	1	2	3	4	5	6	7
28	I'm not properly trained or experienced to do my tasks	1	2	3	4	5	6	7
29	I believe my career is not moving forward	1	2	3	4	5	6	7
30	I am accountable for the future of other individuals (career)	1	2	3	4	5	6	7

We tested 15 respondents in Short Taper 1, Short Taper 2, Eye Forming 1, Eye Forming 2 and Eye Forming 3 processes. Steps that must be carried out :

- Developing questionnaire statements
- Distribute questionnaires to respondents

• Make a recapitulation of respondents' answers that we share
• Tabulated data input to SPSS program for analysis

RESULT

The average age and years of service of the 15 respondents we analyzed in this study were 26 years and 8 years. Most of the 90% responders with a vocational high school diploma are among the 40% who are not married.

Six assessment categories are created from the survey items: 1) Role ambiguity, 2) conflict, 3) overload in terms of quantity, 4) overload in terms of quality, 5) career advancement, and 6) social responsibility others.

The purpose of questionaire not to measure your level of personal stress. Both experts and laypeople in subject of workplace safety and health can utilize this questionnaire.

Six causes of job stress were determined to be within moderate stress in Shearing process section (Taper and Eye Forming) based on the study of psychological factor measurements on the 15 respondents mentioned above. Specifically, with the most important source of possible stress, qualitative overload.

Technology problems, organizational and management issues, as well as Psychosocial variables affect employees' health, happiness, and performance both individually and collectively. These elements include, but are not limited to, workplace demands and content, job control, social interactions, role considerations, contentment with employment, job future, and career-related concerns (Piranveyseh et al., 2016).

CONCLUSION

Conclusions may be taken from studies on the relationship between workload productivity and psychological variables in iron and steel sector. According to studies on workplace stress levels, moderate stress was identified, and explanation of overload was provided in qualitative terms. In order to reduce degree of job stress experienced by employees, more relaxation time must be provided for them.

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