

Muhammad Nicky Has¹, Ade Irma Susanty²
**HEALTH AND SAFETY MANAGEMENT INFLUENCE
 ON EMPLOYEES' PRODUCTIVITY**

The purpose of this study is to analyze the influence of health and safety management on employees' productivity. The number of respondents in this study is 80 employees of an oil terminal, the data was collected through survey. The method used to analyze the data is simple linear regression. There are 9 aspects of health and safety management and 6 aspects of productivity to be analyzed in the study. The result shows that health and safety management has significant influence on employees' productivity. It is also proven that performance will be counterproductive if health and safety are not taken care of.

Keywords: health and safety management; employees' productivity.

Мухаммад Нікі Хас, Аде Ірма Сусанті
**ВПЛИВ УПРАВЛІННЯ ОХОРОНОЮ ПРАЦІ
 НА ПРОДУКТИВНІСТЬ ПЕРСОНАЛУ**

У статті зроблено спробу проаналізувати вплив управління охороною праці на продуктивність персоналу. В проведеному опитуванні взяло участь 80 респондентів – робітників нафтового терміналу (Західна Ява, Індонезія). Дані опитування проаналізовано методом простої лінійної регресії. Встановлено взаємозв'язок між 9 аспектами управління охороною праці та 6 аспектами продуктивності. Результати регресійного аналізу довели існування значного взаємозв'язку між охороною праці на виробництві та продуктивністю персоналу. Також доведено, що персонал стає контрпродуктивним у випадку, коли охорона праці слабка або відсутня на підприємстві взагалі.

Ключові слова: управління охороною праці; продуктивність персоналу.

Рис. 1. Табл. 4. Літ. 10.

Мухаммад Ники Хас, Аде Ірма Сусанті
**ВЛИЯНИЕ УПРАВЛЕНИЯ ОХРАНОЙ ТРУДА
 НА ПРОДУКТИВНОСТЬ ПЕРСОНАЛА**

В статье сделана попытка проанализировать влияние управления охраной труда на продуктивность персонала. В опросе, проведенном авторами, приняло участие 80 респондентов – рабочих нефтяного терминала (Западная Ява, Индонезия). Данные опроса проанализированы методом простой линейной регрессии. Установлена взаимосвязь между 9 аспектами управления охраной труда и 6 аспектами продуктивности. Результаты регрессионного анализа доказали существование значительной взаимосвязи между охраной труда на производстве и продуктивностью персонала. Также доказано, что персонал становится контрпродуктивным в случае, если охрана труда слаба или отсутствует на предприятии вообще.

Ключевые слова: управление охраной труда; продуктивность персонала.

Introduction. Managing human resources has an important role in improving productivity in a company. One of HR management activities is managing health and safety. Health and safety management impacts organizational productivity. Healthy employees contribute more to organization, safety work procedures minimize waste, reduce the rate of work accidents, products rejected and work defects. Finally, the quality of products increase and consequently company gets higher return.

"PT. Oil Power" is one of companies in Bandung that has high risks related to work processes. Their employees have to work very carefully. This company is aware

¹ Telkom University, Bandung, Indonesia.

of this condition, therefore health and safety management has been implemented. There are some procedures to be followed by employees so they can work safely from.

Literature review. According to (Simanjuntak, 2011), work accidents result in destruction and lower yield. It causes products to be disrupted, delayed or stalled, and interferes with the interests of consumer society overall. The increased number of accidents can be caused by non-compliance with standard operating procedures, lack of adequate work equipment, and/or poor of health and safety management.

(Anggoro et al., 2010) show that there is an influence of health on productivity. Safety, occupational health and work environment (physical & psychological) influence work productivity positively.

(Ridley et al., 2003) stated that health refers to "a condition in a healthy and safe work either for the job, the company and the communities and environment around the factory or workplace and employers must provide a place of work free from hazards likely to cause death or serious harm to employees". In a general perspective, health and safety means a condition of being safe from suffering pain, injury or loss. Hence, health safety policies may encompass activities directed at either reduction or complete removal of hazardous conditions capable of causing bodily injuries.

Research objective. On this background, the study attempts to investigate the influence of health and safety as implemented by "PT. Oil Power" on employees' productivity. This is very important to get to know how health and safety management and employees' productivity correlate on a specific real practice example.

Impact of occupational safety and health on organizations. Organizations incur high costs due to poor safety and health programs and efforts. Dorman cited in (EU-OSHA, 2009) notes that some of indirect costs from occupational accidents include:

1. Interruption of production immediately after the accident.
2. Lower morale of coworkers.
3. Staff time taken to investigate and prepare reports on the accident.
4. Recruiting and training costs for workers replacement.
5. Reduced quality of recruitment pool.
6. Damage to equipment and materials.
7. Reduction in product quality after the accident.
8. Reduced productivity of injured workers.
9. Overhead costs of spare capacity maintained to reduce the potential negative effects of any further accidents.

These costs bring negative consequences to organization, such as deterring its ability to accomplish the set goals and diminishing the competitive advantage position of a firm at the marketplace.

Benefits in maintaining effective workplace safety and health programs. There are several benefits derivable from maintaining effective workplace safety and health programs by organizations. Some of such benefits include (EU-OSHA, 2009) direct and indirect benefits, stated as follows:

- a. Direct benefits:
 - 1) reducing insurance premiums;
 - 2) reducing litigation costs;
 - 3) reducing sick pay costs;
 - 4) improving production/productivity rates;

- 5) reducing production and materials damage;
 - 6) lowering accident costs/production delays.
- b. Indirect benefits:
- 1) reducing absenteeism;
 - 2) reducing staff turnover;
 - 3) improving corporate image;
 - 4) more chances for winning contracts;
 - 5) improving job satisfaction/morale.

In general, research findings support the existence of significant correlation between effective occupational safety and health policy compliance and sustainable economic growth as well as organizational development. Previous research results argues that implementing health and safety management in a company has to involve all employees and units. Importantly, health and safety management has to be started from top management (Wieke, 2012). According to (Simanjuntak, 2011), it involves all units and top management to supervise personnel and the entire staffs in order to avoid accidents or occupational diseases.

Based on the previous research of E. Akpan (2011: 162), "successful implementation of this system requires management commitment to the system, effective allocation of resources, and high level of employees' participation". There are 9 components of effective health and safety policy management system briefly explained below:

a. *Management leadership and organizational commitment.* In establishing an effective system, management should develop health and safety policy and then put in a written form. This policy is signed by senior officers and agreed by all of employees. It has to be supported by management, showing leadership commitment to the program is vital.

b. *Roles and responsibilities.* There should be clear information and communication on health and safety roles and responsibilities at all levels of employees in organization. This condition will make employees aware their roles and responsibilities.

a. *Management commitment.* Management at all levels must demonstrate their support of health and safety programs. This could be done through management participation in health and safety training or meeting, seminar or in performing work inspection.

b. *Employees' participation.* It is important for a system to involve all employees in developing health and safety policy. This condition will make all employees feel the responsibility for the company and for their work.

c. *Hazard identification and assessment process.* In the implementation of the policy, employees are required to assess a worksite before work begins so that management or particularly division can know of existing and potential hazards at a workplace. By conducting assessment, management could know what training contents should be given to employees. This condition can promote further development of health and safety standards.

d. *Determined control.* Assigning of control methods is aimed at to eliminating or reducing hazards. These methods could be based on following the procedures of work based on company rules and equipment according to manufacturer specifications.

e. *Hazard control.* At this step, management should implement control for maximum elimination of all serious risk potentially damaging workers.

f. *Enforcement of control.* While controlling, management should develop special enforcement policy. This policy should be well communicated in advance. Consequences for the violence of rules should be clearly explained.

g. *Emergency response plan.* A serious emergency condition (explosion, fire or flood) could seriously affect business operations and put health and safety of employees in jeopardy, even under the best health and safety management plan. It is important for a company to have an emergency response plan. It can reduce the severity of losses. Having a good ERP make employees know what to do and whom to contact.

Framework and hypotheses statement. "PT. Oil Power" has three operational aspects – accepting fuel, saving fuel and distributing fuel. This study believes that measuring employees' productivity is not only about quality and quantity but it also can be measured by others variables (self-development, morale, ability) that could be more representative than just productivity. Measure of employees' productivity based on physical embodiment of income or working per-hour is widely acceptable though. However, when seen from the standpoint of daily supervision, this measurement is not full due to variations (Masno 2010). This is especially true for the work when employees perform services or do maintenance rather than produce a product. Improving employees' productivity should be supported with good management of health and safety because employees who have poor welfare (including health and safety) also have low motivation and as a result – low productivity etc. There are critical variables to determine health and safety in a wider context.

These are as follows:

- a. Management leadership and organizational commitment.
- b. Roles and responsibilities.
- c. Management commitment.
- d. Employees' participation.
- e. Hazard identification and assessment process.
- f. Determined controls.
- g. Hazard control.
- h. Enforcement of control.
- i. Emergency response plan.

Measuring employees' productivity would require the variables as follows:

- a. Abilities.
- b. Improved outcomes.
- c. Morale.
- d. Self-development.
- e. Quality.
- f. Efficiency.

"Successful implementation of this system requires management commitment to the system, effective allocation of resources, and a high level of employees' participation" (Akpan, 2011: 162) and the culture of safety should start from top management (Wieke et al., 2012). This means that top management or senior officers have to get involved directly. The higher culture of health and safety is applied by top management, the higher will be the overall performance.

We tend to believe there is an influence of health and safety management on employees' productivity. According to (Anggoro, 2010; Faisal, 2013), health and

safety have positively influence on employees’ productivity. Hence, the research framework can be described as follows Figure 1.

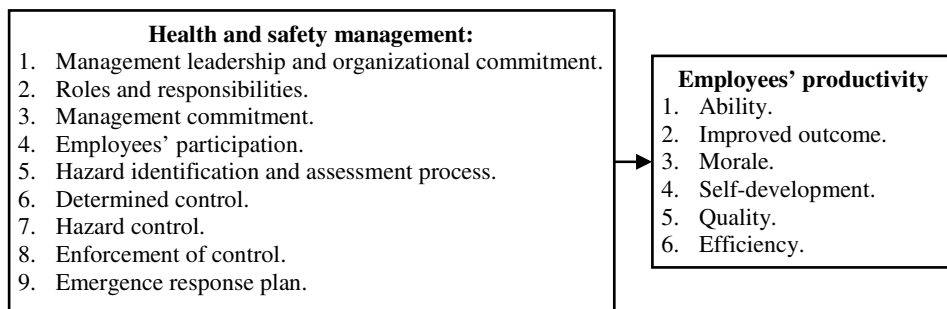


Figure 1. **Framework** (Nuruzzaman et al., 2008)

The hypothesis of this study is: health and safety management has significant influence on employees’ productivity. The subvariables of health and safety management are taken from (Akpan, 2011) and the sub-variables of employees’ productivity are based on (Sutrinso, 2010). The theoretical framework is based on the research by (Nuruzzaman et al., 2008).

Research method and respondents characteristics.

Research method. Causal research is the methodology used here. The object in this study is employees of "PT. Oil Power" (Bandung). Questionnaire is the tool to collect information from the respondents which consist of the items representing variables and subvariables. The sample size is 80 employees who work in production area, since production’s employees are very important when it comes to health and safety of operational procedures. The size of the sample is determined by using Slovin formula because the exact population is known. Data is processed and analyzed by using the simple regression.

Respondents’ characteristics. The data are gained from the questionnaires consisted of respondents’ characteristics and research data. The questionnaires given to 80 respondents contain questions on variable X1 (health and safety management) and Y (employees’ productivity). The respondent characteristics would be as follows Table 1.

Table 1. **Respondents characteristics, authors’**

No.	Indicators	Respondents characteristics					
		Female		Male			
1	Gender %						
		8		92			
2	Age %	< 30 Years		30–40 Years		> 40 Years	
		42		35		23	
3	Length of service %	0–3 Years		4–6 Years		> 6 Years	
		49		20		31	
4	Last education %	Senior high school	Diploma	Bachelor	Master	Doctor	Others
		57	16	22	0	0	5

So, most of the respondents are male, majority age is less than 30. Therefore, the length of service is dominantly between 0 to 3 years. Educational background of most respondents is senior high school.

Key results.

Employees' perception of health and safety management and employees productivity. Variable X in this research is responsible for health and safety management. Health and safety management contains 9 indicators and variable Y is employees' productivity containing 6 indicators as follows:

a. Management leadership and organizational commitment shows that employees' perceptions is 87%, which is considered to be very good. It means there is health and safety management in the company and management puts health and safety standards as high priority. It can be seen management also gives support and commitment by remind the employees to always follow the standards.

b. Roles and responsibilities show the employees' perceptions are 84%, which is considered to be very good. It describes that management has clear communication with employees on the policy, employees know about their roles and responsibilities and follow health and safety rules at work. This also explains that communication between management and employees have been conducted well.

c. Management commitment shows the employees' perception is 86%. Most of the items are more than 85% which for this sub-variable is considered to be very good. This result explains that management has given efforts and commitment to implement health and safety standards.

d. Employees' participation shows employees' perceptions of 83%, which is considered to be very good. In other words, management involves all employees in programs or seminars. Moreover, this result shows that employees' participation is needed in planning of health and safety work in the future as well.

e. Hazard identification and assessment process shows the employees' perception is 87%. Implementing health and safety work, management does not only provide standards but also gives knowledge and training to employees so that their skills are meeting the standards required.

f. Determined control shows the employees' perception of 86%, which is considered to be very good. It means the availability of self-protective tools for employees is controlled well.

g. Hazards control shows the employees' perception of 86%, which is considered to be very good. It describes that employees are checked before entering the work area. Moreover, employees are given procedures in work place which means that they know safety procedures.

h. Enforcement of control shows the employees' perceptions of 82%. Management has conducted enforcement control well enough.

i. Emergence response plan shows the employees' perceptions on the level of 86%. It means that all aspects of emergence response plan are conducted well. Thus, emergence response plan is an important aspect in implementation of health and safety plan.

j. Employees' productivity shows the employees' perception is very high, all items are more than 80% which means that all the aspects under study are important in ensuring employees' productivity.

The influence of health and safety management on employees' productivity (Table 3). The formulation of the result is $Y = -0.006 + 0.979X$. This means if the value of X is 0, the value of Y will be -0.006. X means health and safety. When X is null

that means health and safety are not implemented. When X is null, Y (employees productivity) is -0.006. This proves that when health and safety are not implemented, employees' performance is negative or counter-productive. When the value of X is 0.979, the value of Y becomes 0.973. This means that every 1 point increase in health and safety management will be followed by the increase of employees' productivity for 0.979.

Table 2. Respondents' perceptions, authors'

Variable	Aspects	Average, %
Health and safety management	Management leadership and organizational commitment	87.1
	Roles and responsibilities	84.7
	Management commitment	86
	Employees participation	84.8
	Hazard identification and assessment process	87
	Determined control	86.8
	Hazard control	86.8
	Enforcement control	82.4
Employees' productivity	Emergence response plan	86.5
	Ability	82
	Improved outcomes	84
	Morale	83
	Self-development	84
	Quality	84
	Efficiency	82

Table 3. Simple regression test, authors'

Model	Unstandardized coefficients		Standardized coefficients	T	Sig.
	B	Std. Error	Beta		
1 (Constant)	-.006	.351	.786	-.018	.986
Health and safety management	.979	.087		11.233	.000

The significance value less than 0.005, indicating that the influence of health and safety management on employees' productivity is significant.

Coefficient of determination. The result aims to see great influence of health and safety management on employees' productivity, the calculation is as follows Table 4.

Table 4. Coefficient of determination, authors'

Model	R	R ²	Adjusted R ²	Std. Error of estimation
1	.786	.618	.613	.40544

Table 4 shows that coefficient of determination (R²) is .618, or 62%. This means that health and safety management can explain employees' productivity by .618. In other words, the independent variable has influence of 62% on the dependent variable, the rest (38%) is influenced by some other factors, not included in this research.

Conclusion. Based on the analysis, this study concludes:

a. Health and safety management at "PT. Oil Power" is well implemented. All aspects are measured on health and safety management have the average score over

80%. This means that health and safety management supports well company's operations, especially those related to high risks.

b. Employees' productivity at "PT. Oil Power" is very high. All aspects measured on employees's productivity have the average score of about 80%.

c. There is a significant influence of health and safety management on employees' productivity. This the evidence that good implementation of health and safety influences employees' productivity. The study proves that employees will be counter-productive in case of poor/absence of health and safety management. The influence of health and safety management on employees' productivity is 62%. The rest of 38% influence is attributed to some other factors.

Direction for further investigation. In our further researches we would focus on factors not covered by this study, investigate another variables which may influence employees' productivity such as motivation, abilities, culture, communication etc.

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