

# Determinants of Work Productivity in Laboratory of Regional Public Hospital

Edward Kurnia Setiawan Limijadi<sup>1</sup>, Suliyanto<sup>2</sup>, Wiwiek R. Adawiyah<sup>3</sup>, Ahmad Fajri<sup>4</sup>

<sup>1</sup>Department of Clinical Pathology of Medical Science Faculty of Diponegoro University, Indonesia  
Email: liemsianhok@yahoo.com

<sup>2,3</sup>Department of Economic of Jendral Soedirman University, Indonesia

<sup>4</sup>Department of Financial Analysis of Semarang State Polytechnic, Indonesia

**Abstract**— This study analyze the influence of self-protection, handling infectious materials, and health of employees and the most influence of independent variable to work productivity in the laboratory of regional public hospital (a case at RSUD Prof. Dr. Margono Soekardjo Purwokerto). This study is a survey of employees in the laboratory of RSUD Prof. Dr. Margono Soekardjo Purwokerto. The total sample had been done with 44 subjects. Primary data were taken by distributing questionnaires of self-protection (X1), infectious materials handling (X2), employee health (X3), and work productivity (Y). The secondary data were obtained in relation to research which is the number and characteristics of laboratory employees, work productivity indicators, and others. Data collection by questionnaire used 1 to 7 Likert scale, interview and observation. Reliability and validity tests for the questionnaire, the conversion of ordinal into interval according to successive interval methods, the classic assumption test, multiple regression analysis, F test, t test, and elasticity were done by statistical analysis. The result shows that Coefficient of determination is 74,2%, means 74,2% of work productivity in the laboratory are influenced by independent variables in this study. Independent variables jointly affect work productivity in the laboratory,  $F_{count} > F_{table}$ . Independent variables partially affect work productivity in the laboratory,  $t_{count} > t_{table}$  ( $X1=6,993 > 1,96$ ;  $X2=2,704 > 1,96$ ;  $X3=4,082 > 1,96$ ). Self protection is the most influence on work productivity in the laboratory with the elasticity of 0,483. Based on the results, determinant factors were affected to work productivity, and self protection is the most influence on work productivity in laboratory.

**Keywords**— self-protection, infectious materials handling, employee health, work productivity.

## I. INTRODUCTION

The laboratory is one of the supporting facilities for health services in hospitals. Laboratory installations consist of clinical pathology laboratories, anatomic pathology laboratories, microbiology laboratories, and forensic laboratories. Not all laboratory types are in every hospital because of the different types and levels of each hospital. The most frequent laboratory installations in a hospital are clinical pathology laboratories with microbiology, and anatomical pathology laboratories.

The establishment of a laboratory for health services requires certain conditions that must be met, implemented, and evaluated. Establishment of laboratories requires certain places, chemicals and their storage, provision of laboratory equipment and their placement, security and safety procedures, handling of specimens and infectious waste, prevention of infections and health efforts of workers and human resources. The whole must be standardized and carried out as much as

possible with the aim in order to provide optimal and quality service. These provisions are also intended for internal parties so that occupational safety and health in the laboratory can be guaranteed. The last thing is very important to note because without guaranteeing occupational safety and health, laboratory staff can be easily exposed to infections and other negative impacts. The situation does not provide a comfortable atmosphere for internal employees. Management is required to handle this.

According to the US Department of Laboratory Bureau of Laboratory Statistics in Teguh (2010) said that the results of the National Safety Council (NSC) report in 1988 showed that the occurrence of accidents in hospitals was 41% greater than workers in other industries. Cases that often occur are needle sticking, sprains, back pain, scratches / cuts, burns, infectious diseases and others. A number of cases were reported as being compensated by hospital workers, which were sprained, stretched:

52%; bruises, bruises: 11%; cuts, blisters, stab wounds: 10.8%; fracture: 5.6%; multiple injuries: 2.1%; burns : 2%; scratch wounds: 1.9%; infection : 1.3%; dermatitis: 1.2%; and others: 12.4% . Also presented the results based on work accident research in the Clinical Pathology laboratory of the General Hospital, DR. Zainoel Abidin (RSUZA) Banda Aceh in 2009 amounted to 69.6%. The research also informs that occupational safety and health management (K3 promotion and training) is related to work accidents at the Clinical Pathology Laboratory of Banda Aceh Hospital (Salawati, 2009).

The number of events above is a case that occurs in hospitals and Clinical Pathology laboratories which are part of the hospital, there is still little research on workplace accidents in hospitals and laboratories, so that data on work accident rates are still limited. Based on the number of events in both places, research is needed as an effort to improve K3 in the laboratory. Guaranteed Occupational Safety and Health (K3) in the laboratory, will produce good work productivity. This study will examine the relationship. This is consistent with the description in the International Journal of Occupational Safety and Ergonomics (11: 3), that there is a relationship between job satisfaction with safety policy management. This is found in workers who receive safe working conditions in their organization. Workers who are in unsafe jobs, will get dissatisfaction at work (Audrie, 2006). Job satisfaction is related to productivity. The higher satisfaction, will increase work productivity as well, and vice versa. This research was conducted in another field, not in the health sector. Therefore, it is necessary to do research on this matter in the field of health, especially in the laboratory. Prof. Regional General Hospital Dr. Margono Soekardjo Purwokerto-Indonesia is a large class B education hospital with a large number of employees in each section. The hospital has a laboratory installation for public health services . There are quite a lot of complaints at the laboratory installation according to the laboratory installation manager regarding the results of the examination and other matters. Like other workplaces, laboratories need to be concerned about OSH which can affect employee work productivity. There are no studies on the relationship between K3 and work productivity in the laboratory. Conducting this research, will be known about the relationship at Prof. Regional General Hospital laboratory. Dr. Margono Soekardjo Purwokerto.

## II. RESEARCH METHODOLOGY

This research is a survey research on laboratory employees at Regional Public Hospital (RSUD Prof. Dr. Margono Soekardjo Purwokerto -

Indonesia). Sampling with saturated sampling method, amounting to 44 people. Primary data was obtained by distributing questionnaires about self protection (X 1), handling infectious material (X2), employee health (X 3), and work productivity (Y) . Secondary data taken are the number and characteristics of laboratory employees, indicators of work productivity, and other data . Data collection with questionnaires in the form of a Likert scale 1-7 scale, interviews and observations. Reliability and validity tests were carried out for the questionnaire ; converting ordinal data into intervals according to the MSI ( Successive Interim Method 1 ) ; classical assumption tests which include tests of normality, heteroscedasticity, multicollinearity, autocorrelation, and linearity; multiple regression analysis ; F test ; t test ; and elasticity.

## III. RESULT AND DISCUSSION

The results of testing the questionnaire are reliable and valid as a data collection tool. The classic assumption test results are that the data on each variable are normally distributed, there is no heteroscedasticity, multicollinearity, autocorrelation, and linearity occurs in these data. In the multiple regression analysis the following formula is obtained:  $Y = 1.541 + 0.275 X_1 + 0.09025 X_2 + 0.157 X_3$  .

A constant value of 1.541 means the work productivity variable in the laboratory of the Regional General Hospital Prof. Dr. Margono Soekardjo Purwokerto is 1.541 percent with the assumption that the variables of self-protection, handling of infectious material and employee health are constant.

Coefficient X 1 of 0.275 means that the variable of self-protection has a positive relationship with the variable work productivity in Prof. Regional General Hospital Laboratory Dr. Margono Soekardjo Purwokerto, this shows that the increase in self-protection variable will increase the variable of work productivity. If there is an increase in the variable of self-protection by one unit, it will raise the work productivity variable in the laboratory of the General Hospital in Prof. Dr. Margono Soekardjo Purwokerto is 0.275 units, assuming that the other variables remain at the 95 percent confidence level.

The X 2 coefficient of 0.09025 means that the infectious material handling variable has a positive relationship with the work productivity variable in the laboratory of the Regional General Hospital Prof. Dr. Margono Soekardjo Purwokerto, this shows that the increase in infectious material handling variables will increase work productivity variables. If the infectious material handling variable rises by one unit, it will raise the work productivity variable in the laboratory of Prof. Regional General Hospital Dr. Margono Soekardjo Purwokerto

amounted to 0.09025 units, assuming that the other variables remained with a confidence level of 95 percent. The coefficient X 3 amounted to 0.157 means that the variable employee health has a positive relationship with labor productivity in the laboratory variables Regional General Hospital Prof. Dr. Margono Soekardjo Purwokerto, this shows that the increase in employee health variables will increase work productivity variables. If the employee health variable rises by one unit, it will raise the work productivity variable in the laboratory of the Regional General Hospital Prof. Dr. Margono Soekardjo Purwokerto is 0.157 units, assuming that the other variables remain with a confidence level of 95 percent.

Through statistical calculations obtained the coefficient of determination of 0.742 or 74.2 percent. This means that 74.2 percent rise and fall of the variable work productivity in the laboratory of the Regional General Hospital Prof. Dr. Margono Soekardjo Purwokerto is influenced by personal protection, infectious material handling and employee health, while the remaining 25.8 percent is explained by other independent variables not included in this study.

The thing in the F test shows that the calculated F value > F table value or is in the rejection area of  $H_0$  with a F table value of 2.61, while the calculated F value of 38.373, thus the variables of personal protection, handling of infectious material and employee health together have the same significant effect on the variable work productivity. In the t test, the results show that the variables of self-protection, handling of infectious material and employee health partially have a significant effect on work productivity variables in the laboratory of Prof. Regional General Hospital Dr. Margono Soekardjo Purwokerto with t count value > t table value. Sequentially value of t count is 6.993; 2,704; 4,082, while the value of t table is 1.96.

Based on the elasticity test results obtained the value of self-protection elasticity (E1) of 0.483, handling of infectious material (E2) of 0.151, and employee health (E3) of 0.278. The value of elasticity of self-protection is greater than the value of elasticity in handling infectious material and employee health so that it can be interpreted that self-protection has the greatest influence on work productivity.

The results showed that personal protection, handling of infectious material, and the health of each employee affected the work productivity of employees in hospital laboratories. These results are consistent with the initial hypothesis put forward in the previous section. As stated earlier, the three independent variables are part of K3 in the laboratory. The results of this study are the first in the laboratory field, there has been no prior research on this

matter. However, there are other studies in other fields which state that occupational safety and health affect work productivity.

Current research shows that self-protection, handling of infectious material, and the health of each employee affect the work productivity of employees in hospital laboratories. The three independent variables are components of K3. These results are consistent with research conducted by PT Agar Sehat Makmur Lestari Pasuruan which examined the effect of K3 on productivity. The results show that there is a significant influence between the implementation of K3 on employee work productivity (Pamungkas, 2008). In addition, research on the textile company PT. Lokatex Pekalongan, found that there is a significant positive relationship between perceptions about the K3 program with work productivity (Aprilia, 2008).

Personal protection carried out in the laboratory of the Regional General Hospital Prof. Dr. Margono Soekardjo Purwokerto is carried out in several ways. The most important thing to do is to wear gloves when working in a laboratory. Not forgetting also the use of laboratory coats and footwear. The routine personal protective equipment is always used when working in the laboratory and removed when leaving the laboratory. But it is still not used some other personal protective equipment such as respirators and glasses. Indeed, both of these are not routine to be used, only for some special handling of some examination materials. Hand washing activities are also carried out by laboratory employees after work, giving protection to each employee. Likewise, disposable and reusable materials are also handled according to proper and correct procedures.

Handling infectious material has also been tried well. Samples received are in a closed state, and are always maintained so as not to spill. If there is a spill, it will immediately be cleaned in the right way. The sterilizer works well so that infectious material can be handled. The use of disinfectants as an effort to prevent infectious material is also carried out if necessary. This action also functions as self-protection against the infectious material.

The health of employees in the laboratory is well considered. K first aid brain is available in the laboratory, there are also written warnings that are useful for preventing people from entering the laboratory if they are not interested. There are also other health programs such as immunizations as indicated. For female employees also get special attention if needed because of something for example in a state of pregnancy or unhealthy circumstances. The activities and circumstances described above are likely factors that support the hypothesis accepted in statistical tests that there is an effect of self-

protection, handling of infectious material, and employee health on employee work productivity in hospital laboratories.

Personal protection most influences the work productivity of employees in hospital laboratories. The results of this study are also in accordance with the results of other studies. Research on the Relationship between the Use of Hand Protective Equipment with Disabilities Due to Work Accidents at PT. Purinusa Eka Persada Semarang in 2005 found that there was a relationship between the use of hand protective equipment and the consequences of work accidents which ultimately affected the work productivity of employees (Utami, 2006). There is a descriptive study of the use of personal protective equipment in Dr. Soetomo Surabaya, that the highest K3RS control is technically not good, and administratively the highest is not very good. This can be seen from the unavailability of PPE in the hospital and inadequate, employees also do not use PPE when working (Sholihah, 2006). In research on the use of PPE in Cipto Mangunkusumo General Hospital, it was found that there were more than 40% of staff in laboratories at high risk of being infected with dangerous diseases because they only used one PPE. The risk will be higher if officers do not use PPE and do not wash their hands after work (Perwitasari, 2006). Based on the results of these studies and several other studies it can be seen that personal protective equipment plays a very important role in occupational safety and health. This situation also applies in the laboratory for the protection of employees against the transmission of infectious biological agents, so that employees avoid various diseases. This situation will certainly increase employee productivity in hospital laboratories. Conversely, if an employee is exposed to an illness it will reduce his work productivity.

This study uses parametric statistical analysis because of normal data distribution. Thus the results of research in accordance with the hypotheses previously made can be drawn conclusions and conclusions can be generalized. This study has limitations in terms of the use of independent variables which are limited to only three factors. There are still many other factors that influence K3 in the laboratory that affect the work productivity of hospital laboratory employees.

#### IV. CONCLUSION

Based on result and discussion, independent variables were affected to work productivity. Self-protection is the most influenced factor on work productivity in laboratory of RUSD Prof. Dr. Margono Soekardjo Purwokerto-Indonesia.

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