RISK ANALYSIS OF THE OCCUPATIONAL AND HEALTH SAFETY USING HAZARD IDENTIFICATION, RISK ASSESSMENT AND RISK CONTROL (HIRARC) METHOD IN THE UNIVERSITY OF MUHAMMADIYAH JEMBER

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ABSTRACT

Background: University of Muhammadiyah Jember has the potential and risk of dangers, so the launching of the Occupational and Health Safety program in this office area is something that needs to be carried out, in order to create a healthy, safe and comfortable office and the realization of healthy, safe, fit, performing and productive employees. Hazard Identification, Risk Assessment and Risk Control is one of the ways to identify potential dangers in any kind of job activities. **Purpose:** This research is held to analyze the risk of work accident by using HIRARC method. **Methods:** This research uses descriptive qualitative research method. The qualitative method is used to describe the condition, to identify and recognize the work accident analysis. **Results:** The findings show that hazard in the job activity is identified as chemical, mechanical, physical, electrical, ergonomic, biological, psychosocial and environmental hazards. The risk assessment which is held denotes that there are 6 high risk, 13 medium risk and 4 low risk. **Conclussion:** Risk control that can be applied are engineering controls, administrative and personal protective equipment to reduce unsafe action and unsafe condition. HIRARC method which has beed applied at the University of Muhammadiyah Jember proves that work activities in the office has a risk that should be controlled.

Keywords: *Occupational and Health Safety; HIRARC; Work Accident; Office*

BACKGROUND

Occupational and Health Safety in the office is occupational safety and health in the office area are all activities to ensure and protect the safety and health of employees through efforts to prevent occupational accidents and diseases due to work in the office (PMK, 2016). The government's goal of launching OHS in office areas is

to create a healthy, safe and comfortable office for the creation of healthy, safe, fit, performing and productive employees.

Data from the Central Statistics Agency in 2018 stated that the total workforce was 133.94 million, 127.07 million people working in the formal and informal sectors, while 6.87 million others were unemployed. Among them are formal workers in the industrial and office sectors. Based on exposure to hazard risks, the industrial sector will be exposed to mild to severe potential hazards, while the office sector is exposed to mild to moderate potential hazards.

In this era, occupational safety and health is a must for work organizers to increase productivity. The maintenance of good occupational health will minimize the number of morbidity, absenteeism, disabilities and work accidents, so that healthy and productive workers will be realized. Work accidents in the office sector can occur as a result of several potential hazards in the work environment, including physical, chemical, biological, ergonomic, psychosocial, mechanical, electrical, waste and disaster hazards.

Potential hazards in the work environment can be identified by using the HIRARC (Hazard Identification, Risk Assessment and Risk Analysis) method. HIRARC is a process of determining the priority of occupational accident risk level control so that it can classify the potential hazards into high, medium and low risks. This process will later facilitate the evaluation process (Department of Occupational Safety and Health, 2008).

Riskesdas 2018 data states that the prevalence of non-communicable diseases has increased if it compared to 2013. These diseases include cancer, stroke, chronic kidney disease, diabetes mellitus and hypertension. The increase of non-communicable diseases is related to lifestyle, such as smoking, alcoholic drinking, inadequate physical activity, and minimal consumption of vegetables and fruits. Increasing the level of education and professional workers in Indonesia will increase the number of office workers. Sedentary behavior or lack of physical activity is synonymous with office workers. Therefore, increasing the implementation of occupational safety and health in each institution or agency is something that must be developed and improved (Presidential Instruction No.1, 2017).

Until now, University of Muhammadiyah Jember has not conducted a risk analysis yet, so that the researcher is interested in conducting risk analysis to determine the potential hazards of office workers and its control plan. The OHS risk analysis uses the HIRARC method which is expected to be able to control the existing risks, so that the healthy, fit and productive workers in providing services also can be expected.

METHODS

This research used a qualitative method with a descriptive design. The work area chosen is a work area that has a potential hazard. The main informants of this research are the main leaders, represented by the head of the quality assurance agency, the head of the bureau, the dean, the head of the laboratory, the laboratory assistant and the head of security. Informants were selected by using purposive sampling. Sources of data in this research are primary data and secondary data. Primary data were obtained through interviews and observations by using the HIRARC method. Secondary data were obtained from study of supporting documents.

RESULTS

Hazard Identification

The first stage of HIRARC is hazard identification. The results of hazard identification at the University of Muhammadiyah Jember are presented in the following table:

Table 1. Hazard Identification of the General Administration Unit in the University of Muhammadiyah Jember

No	PROCESS	HAZARD	RISK	CONSEQUENCES
1	Sweeping (floor)	- Dust - Un ergonomic broom	- Inhaled - Contact with mucosa membrane (eyes, node and mouth) - Fatigue	- Respiratory dissorder - Konjungtivitis - Irritation - Low back pain and the joints
2	Floor moping	- Chemical agent from floor desinfectan - Slippery floor - Moping technique - Equipment	- Spilled - Misuse - Slip on - Fall down - Joint pain	- Intoxication - Muculoskeletal dissorder
3	Washing floor moping equipment	- Chemical agent from floor desinfectan - Microorganism - Body language	- Exposure of chemical agent - Microorganism exposure - Not ergonomic	- Dermatitis - Iritation - Muculoskeletal dissorder
4	Cleaning the furniture	- The way of cleaning (stand up, tiptoe, using portable stair) - Microorganism (virus, bacteria, germs) - Chemical agent	- Not ergonomic - Fall down - Microorganism exposure - Chemical exposure	- Muculoskeletal dissorder - GIT dissorder
5	Cutting grass	- Sharp equipment	- In touch with sharp equipment. - Dust	- Injury - Respiratory dissorder
6	Electrical instalation	- Electric current - Sparks	- Fall down - Electric shock - Short circuit	- Muculoskeletal dissorder - Burn injury - Fire - Death
7	Manual handling	- Body position - Body weight bearing - Height	- Dislocate - Increasing intra abdominal pressure - Fall down	- Muculoskeletal dissorder - LBP - Hernia
8	Working with many tools and equipment	Work equipment (dimention, shape and design)	- Fatigue - Injury	- Work related musculoskeletal disorders (WMSDs) - Low back pain

				- Tension headache - Frozen shoulder
9	Maintain environment security	- Sun light - Working out door - Interaction with many people - Foreigners	- Dazzled - Hot air exposure - Microorganism exposure - Crime	- Headache - Dehidration - Respiratory dissorder - Physical harassment
10	Work in 2-4th floor	Height	- Fall down	- Fatigue - Dislocation - Fracture
11	Working indoor	Earthquake	- Wrong direction - Fall down - Squeezed	- Hit by an object - Fracture

Table 2. Hazard Identification of the Laboratorium Unit in the University of Muhammadiyah Jember

No	PROCESS	HAZARD	RISK	CONSEQUENCES
Nursing Laboratorium				
1	Preparing practicum that uses chemicals agent	- Chemical agent	- Wrong reagent - Inhaled - Hit by the hand - Swallowed	- Explosion - Shortness of breath - Dermatitis - Burn injury - Intoxication
2	Preparing practicum that uses sharp equipment	- sharp equipment - Used needles	- Injury - Punctured	- Infection - Contagious disease
3	Preparing practicum that uses electrical	- Electric current - Sparks	- Fall down - Electric shock - Short circuit	- Muculoskeletal dissorder - Burn injury - Fire - Death
4	Preparing practicum related to invasive procedures	- Medical waste	- Microorganism exposure	- Contagious disease
Basic Laboratorium				
1	Preparing practicum	- Chemical agent	- Wrong reagent - Inhaled - Hit by the hand - Swallowed	- Explosion - Shortness of breath - Dermatitis - Burn injury - Intoxication
		- Electric current - Sparks	- Fall down - Electric shock - Short circuit	- Muculoskeletal dissorder - Burn injury - Fire - Death
Computer Laboratorium				
1	Preparing practicum	- Computer - Electric current	- Microorganism exposure - Short circuit	- Respiratory/ GIT dissorder - Burn injury

Table 3. Hazard Identification of the Computer Laboratorium Unit in the University of Muhammadiyah Jember

No	PROCESS	HAZARD	RISK	CONSEQUENCES
1	Teaching and learing process and administration	- Electric current - Electronics equipment	- Electric shok - Short circuit	- Muculoskeletal dissorder - Burn injury - Fire - Death
2	Work with computer	Radiation	- Photokeratitis - Eyestrain - Increased radiation	- Eyes iritatiton - Melatonin hormone dissorder - Asthenopia - Cataract - Nausea - Vominiting - Headache
3	Work with electronic equipment	- Electric current - Electronics equipment	- Electric shok - Short circuit	- Muculoskeletal dissorder - Burn injury - Fire - Death
4	Work indoor with air conditioner	- AC - Aspergilus	- Spreading disease	- Respiratory dissorder - Aspergilosis
5	Manual writing and reading	Not ergonomic postion	- Fatigue - Injury	- Work related musculoskeletal disorders (WMSDs) - Low back pain - Tension headache - Frozen shoulder
6	Academic service	- Working hours - Work load - Fatigue	- Stress related work	- Performance degradation - Motivation degradation - Service quality degradation

RISK ASSESSMENT

Risk assessment is carried out to evaluate the amount of risk and impact that will be caused. The results of the risk assessment at the work unit at the University of Muhammadiyah Jember are as follows:

Table 4. Risk Assessment of the General Administration Unit in the University of Muhammadiyah Jember

No	PROCESS	HAZARD	RISK	CONSEQUENCES	L	S	RR
1	Maintain environment security	- Sun light - Working out door - Interaction with many people - Foreigners	- Dazzled - Hot air exposure - Microorganism exposure - Crime	- Headache - Dehidration - Respiratory dissorder - Physical harassment	4	4	16

2	Cleaning the furniture	- The way of cleaning (stand up, tiptoe, using portable stair) - Microorganism (virus, bacteria, germs) - Chemical agent	- Not ergonomic - Fall down - Microorganism exposure - Chemical exposure	- Muculoskeletal dissorder - GIT dissorder	4	3	12
3	Electrical instalation	- Electric current - Sparks	- Fall down - Electric shock - Short circuit	- Muculoskeletal dissorder - Burn injury - Fire - Death	3	4	12
4	Floor moping	- Chemical agent from floor desinfectan - Slippery floor - Moping technique - Equipment	- Spilled - Misuse - Slip on - Fall down - Joint pain	- Intoxication - Muculoskeletal dissorder	4	2	8
5	Manual handling	- Body position - Body weight bearing - Height	- Dislocate - Increasing intra abdominal pressure - Fall down	- Muculoskeletal dissorder - LBP - Hernia	4	2	8
6	Work in 2-4th floor	Height	- Fall down	- Fatigue - Dislocation - Fracture	2	4	8
7	Working indoor	Earthquake	- Wrong direction - Fall down - Squeezed	- Hit by an object - Fracture	2	4	8
8	Cutting grass	- Sharp equipment	- In touch with sharp equipment. - Dust	- Injury - Respiratory dissorder	3	2	6
9	Working with many tools and equipment	Work equipment (dimention, shape and design)	- Fatigue - Injury	- Work related musculoskeletal disorders (WMSDs) - Low back pain - Tension headache - Frozen shoulder	3	2	6
10	Sweeping (floor)	- Dust - Un ergonomic broom	- Inhaled - Contact with mucosa membrane (eyes, node and mouth) - Fatigue	- Respiratory dissorder - Konjungtivitis - Irritation - Low back pain and the joints	4	1	4
11	Washing floor moping equipment	- Chemical agent from floor desinfectan - Microorganism - Body language	- Exposure of chemical agent - Microorganism exposure - Not ergonomic	- Dermatitis - Iritation - Muculoskeletal dissorder	4	1	4

Table 5. Risk Assessment of the Laboratorium Unit in the University of Muhammadiyah Jember

No	PROCESS	HAZARD	RISK	CONSEQUENCES	L	S	RR
Nursing Laboratorium							
1	Preparing practicum that uses sharp equipment	- sharp equipment - Used needles	- Injury - Punctured	- Infection - Contagious disease	3	4	12
2	Preparing practicum that uses electrical	- Electric current - Sparks	- Fall down - Electric shock - Short circuit	- Muculoskeletal dissorder - Burn injury - Fire - Death	3	3	9
3	Preparing practicum related to invasive procedures	- Medical waste	- Microorganism exposure	- Contagious disease	3	3	9
4	Preparing practicum that uses chemicals agent	- Chemical agent	- Wrong reagent - Inhaled - Hit by the hand - Swallowed	- Explosion - Shortness of breath - Dermatitis - Burn injury - Intoxication	3	2	6
Basic Laboratorium							
1	Preparing practicum	- Chemical agent	- Wrong reagent - Inhaled - Hit by the hand - Swallowed	- Explosion - Shortness of breath - Dermatitis - Burn injury - Intoxication	3	2	6
		- Electric current - Sparks	- Fall down - Electric shock - Short circuit	- Muculoskeletal dissorder - Burn injury - Fire - Death	1	4	4
Computer Laboratorium							
1	Preparing practicum	- Computer - Electric current	- Microorganism exposure - Short circuit	- Respiratory/ GIT dissorder - Burn injury	1	4	4

Table 6. Risk Assessment of the Staffing Unit in the University of Muhammadiyah Jember

No	PROCESS	HAZARD	RISK	CONSEQUENCES	L	S	RR
1	Work indoor with air conditioner	- AC - Aspergilus	- Spreading disease	- Respiratory dissorder - Aspergilosis	4	3	12
2	Manual writing and reading	Not ergonomic postion	- Fatigue - Injury	- Work related musculoskeletal disorders (WMSDs) - Low back pain - Tension	4	3	12

				- headache - Frozen shoulder			
3	Academic service	- Working hours - Work load - Fatigue	- Stress related work	- Performance degradation - Motivation degradation - Service quality degradation	3	3	9
4	Work with computer	Radiation	- Photokeratitis - Eyestrain - Increased radiation	- Eyes iritatiton - Melatonin hormone dissorder - Asthenopia - Cataract - Nausea - Vominiting - Headache	4	2	8
5	Teaching and learing process and administration	- Electric current - Electronics equipment	- Electric shok - Short circuit	- Muculoskeletal dissorder - Burn injury - Fire - Death	2	3	6

L : *Likelihood*
S : *Severity*
RR : *Risk Rating*

Table 7. Risk Control of the General Administration Unit in the University of Muhammadiyah Jember

No	PROCESS	HAZARD	RISK	CONSEQUENCES	RR	CONTROL
1	Maintain environment security	- Sun light - Working out door - Interaction with many people - Foreigners	- Dazzled - Hot air exposure - Microorganism exposure - Crime	- Headache - Dehidration - Respiratory dissorder - Physical harassment	16	- Provides sun glasses - Wearing face mask - Obtaining hand hygiene - Provides fire fighter training - Provides tools for self defence (recommended punches/ weapon) - Adjusting work shift - Provides metal detector
2	Cleaning the furniture	- The way of cleaning (stand up, tiptoe, using portable stair) - Microorganism (virus, bacteria, germs) - Chemical agent	- Not ergonomic - Fall down - Microorganism exposure - Chemical exposure	- Muculoskeletal dissorder - GIT dissorder	12	- Use an adjustable cleaning tools - Wearing gloves - Wearing face mask - Wearing head protection (helmet, hat) - Obtaining hand hygiene
3	Electrical instalation	- Electric current - Sparks	- Fall down - Electric shock - Short circuit	- Muculoskeletal dissorder - Burn injury - Fire - Death	12	- Cable control regularly - Wearing personal protective equipment - Provides fire extinguisher
4	Floor	- Chemical	- Spilled	- Intoxication	8	- Provides a cabinet for

	moping	agent from floor desinfectan - Slippery floor - Moping technique - Equipment	- Misuse - Slip on - Fall down - Joint pain	- Muculoskeletal dissorder		storing chemical agent - Labeling clearly - Expired date control of desinfectant - Applying signs of danger and hazardous agent
5	Manual handling	- Body position - Body weight bearing - Height	- Dislocation - Increasing intra abdominal pressure - Fall down	- Muculoskeletal dissorder - LBP - Hernia	8	- Providing lifting tools - Perform routine inspection on the safety of stairs - Socialization of SOP and lifting technique and ergonomic concept
6	Work in 2-4th floor	Height	- Fall down	- Fatigue - Dislocation - Fracture	8	- Lakukan inspeksi rutin pada keamanan anak tangga - Memasang rambu keselamatan
7	Working indoor	Earthquake	- Wrong direction - Fall down - Squeezed	- Hit by an object - Fracture	8	- Applying signs of evacuation - Conducting a disaster emergency response simulation
8	Cutting grass	- Sharp equipment	- In touch with sharp equipment. - Dust	- Injury - Respiratory dissorder	6	- Put on boots - Put on mask - Wearing cloth gloves - Arrange SOP for all tools and equipments
9	Working with many tools and equipment	Work equipment (dimention, shape and design)	- Fatigue - Injury	- Work related musculoskeletal disorders (WMSDs) - Low back pain - Tension headache - Frozen shoulder	6	- Provides ergonomic furniture - Cover the computer screen with a screen safer - Schedule breaks every 2-4 hours between work hours
10	Sweeping (floor)	- Dust - Un ergonomic broom	- Inhaled - Contact with mucosa membrane (eyes, node and mouth) - Fatigue	- Respiratory dissorder - Konjungtivitis - Irritation - Low back pain and the joints	4	- Wearing a mask while sweeping - Provides a light weight broom, easy to handle and use
11	Washing floor moping equipment	- Chemical agent from floor desinfectan - Microorganism - Body language	- Exposure of chemical agent - Microorganism exposure - Not ergonomic	- Dermatitis - Iritation - Muculoskeletal dissorder	4	- Put on mask - Wearing long rubber gloves - Using a safe mop (avoid hold the mop when washing) - Apply hand hygiene

Table 8. Risk Control of the Laboratorium Unit in the University of Muhammadiyah Jember

No	PROCESS	HAZARD	RISK	CONSEQUENCES	RR	CONTROL
Nursing Laboratorium						
1	Preparing practicum that uses sharp equipment	- sharp equipment - Used needles	- Injury - Punctured	- Infection - Contagious disease	12	- Make a standard operational procedures - Provide a sharp container - Apply hand hygiene
2	Preparing practicum that uses electrical	- Electric current - Sparks	- Fall down - Electric shock - Short circuit	- Muculoskeletal dissorder - Burn injury - Fire - Death	9	- Put up SOP for the use of tools on each electronic device - Perform routine controls - Turn on electronic device every day (even if not in use) - Provide and ensure that fire extinguisher can be used
3	Preparing practicum related to invasive procedures	- Medical waste	- Microorganism exposure	- Contagious disease	9	- Creating MOU for medical waste and toxic hazardous materials waste control - Create SOP for medical waste disposal - Aplly hand hygiene - Decontaminate room and furniture after use
4	Preparing practicum that uses chemicals agent	- Chemical agent	- Wrong reagent - Inhaled - Hit by the hand - Swallowed	- Explosion - Shortness of breath - Dermatitis - Burn injury - Intoxication	6	- Separating chemicals agent according to their spessification - MSDS must be available - Labeling must be clear - Provide fire extinguisher - Wearing PPE when contact - Provide a first aid kit - Decontaminate the room after use
Basic Laboratorium						
1	Preparing practicum	- Chemical agent	- Wrong reagent - Inhaled - Hit by the hand - Swallowed	- Explosion - Shortness of breath - Dermatitis - Burn injury - Intoxication	6	- Separating chemicals agent according to their spessification - MSDS must be available - Labeling must be clear - Provide fire extinguisher - Wearing PPE when contact - Provide a first aid kit - Decontaminate the room after use
		- Electric current - Sparks	- Fall down - Electric shock - Short	- Muculoskeletal dissorder - Burn injury - Fire - Death	4	- Put up SOP for the use of tools on each electronic device - Perform routine controls - Turn on electronic

			circuit			device every day (even if not in use) - Provide and ensure that fire extinguisher can be used
Computer Laboratorium						
1	Preparing practicum	- Computer - Electric current	- Microorganism exposure - Short circuit	- Respiratory/ GIT dissorder - Burn injury	4	- Apply keyboard protector - Decontaminate the equipment and room after use - Put up SOP for the use of tools on each electronic device - Perform routine controls - Turn on electronic device every day (even if not in use) - Provide and ensure that fire extinguisher can be used

Table 9. Risk Control of the Staffing Unit in the University of Muhammadiyah Jember

No	PROCESS	HAZARD	RISK	CONSEQUENCES	RR	CONTROL
1	Work indoor with air conditioner	- AC - Aspergilus	- Spreading disease	- Respiratory dissorder - Aspergilosis	12	- Put on face mask - Perform regular maintenance of the AC - AC maintenance control card monitoring - Consuming immunobooster
2	Manual writing and reading	Not ergonomic postion	- Fatigue - Injury	- Work related musculoskeletal disorders (WMSDs) - Low back pain - Tension headache - Frozen shoulder	12	- Provides an ergonomic chair and table - Cover the computer screen with a screen safer - Schedule breaks every 2-4 hours between work hours
3	Academic service	- Working hours - Work load - Fatigue	- Stress related work	- Performance degradation - Motivation degradation - Service quality degradation	9	- Enforcement of reward and punishement - Rescheduling work hours - Rolling work place - Socialization of SOP and job descriptions
4	Work with computer	Radiation	- Photokeratitis - Eyestrain - Increased radiation	- Eyes iritatiton - Melatonin hormone dissorder - Asthenopia - Cataract - Nausea - Vominiting - Headache	8	- Apply a screen protector - Make a schedule of rest - Upgrading the type of computer - Setting up the computer with the back facing the wall
5	Teaching and learing process	- Electric current	- Electric shok	- Muculoskeletal dissorder	6	- Apply keyboard protector

	and administration	- Electronics equipment	- Short circuit	- Burn injury - Fire - Death		- Decontaminate the equipment and room after use - Put up SOP for the use of tools on each electronic device - Perform routine controls - Turn on electronic device every day (even if not in use) - Provide and ensure that fire extinguisher can be used

DISCUSSION

The results of hazard identification in the work unit of the general administration, laboratories and personnel unit at Muhammadiyah University of Jember stated that there were sources of danger in the types of chemical, mechanical, physical, electrical, ergonomic, biological, psychosocial and environmental. This is in accordance with Baskoro's research (2015) which states that there are types of hazards in the form of physical, chemical, ergonomic and psychosocial hazards at the Faculty of Health, University of Indonesia. Physical, chemical and biomechanical hazards related to ergonomics (Permenkes No 48, 2016).

Potential hazards in offices include chemical hazards which is found to be potentially exposed to staff working in laboratories as well as cleaners, namely detergents, disinfectants, dust from markers and corrosive tools and some chemical reagents. Chemicals continuously used causing irritation, intoxication, diseases of the skin, eyes and respiratory tract. As port d'entree is toxic to the human body in three ways, namely inhalation, digestion and skin (Sujoso, 2012). Storage of reagents in a laboratory that is not standardized, does not have a Material Safety Data Sheet (MSDS) is also a risk of unwanted things, such as explosion and fire. Making SOP and labeling of each chemical with MSDS is very necessary to avoid undesirable things. The controls which is carried out to reduce potential hazards and risks are engineering control, administrative control and the use of appropriate PPE (Kumara, 2019).

The mechanical hazards were found in lawn mowers, stairs and floors. Open mower has potential hazard for worker, where the blade can come off and injure the worker. Slippery floors and stairs and safety rubber on stairs can be source of mechanical hazards.

The activity of going up and down stairs is a physical activity that is commonly carried out by all staff and is considered to be healthier. This is in accordance with Suwarni and Ramadhani's research, 2019 which states that the activity of going up and down stairs can support body fitness. However, some stairs are not in accordance with safety standards so that there is a potential for fatigue and accidents (near miss). To reduce and avoid this incident, the stairs must be made as comfortable as possible in accordance with existing standards, because ideally when the stairs are passed by the user, they will not feel difficult or tired (Saputra, 2020).

Physical hazards are potential hazards that cause health problems for exposed workers (Sujoso, 2012). In the office world, radiation exposure from computer use has the potential to be an actual risk. Based on the results of the interview, it was found that eye disorders were common among both administrative staff and lecturers as a

result of prolonged computer use. The effect of the length of exposure to this monitor also plays a major role in existing complaints. This is in line with research by Bhanderi et.al which states that someone who works in front of a computer screen> 4 hours continuously has a 26-fold risk of suffering from Computer Vision Syndrome (CVS) compared to individuals who also work in front of a computer screen for <4 hours continuously.

The daytime break is used only for prayer and lunch then returning to work in front of computer screen. The demands of work lead to a reduced frequency of eye breaks, so multiple short breaks are more efficient than one-time long breaks. Responding to this problem, the American Academy of Opthalmology provides tips to avoid eye distraction while working, including installing a screen protector to reduce glare, follow the 20-20-20 rule, which is every 20 minutes of work, shift your view from the monitor to an object 20 feet away (six meters) for 20 seconds.

Office areas cannot be separated from electrical equipments. Electrical hazard signals result from electric currents and sparks or short circuits. Fire problems are often based on short circuits, human errors, flammable materials and inaccurate selection of electrical installation equipment (Hambaly, Setiawati, & Majid, 2018)

Ergonomic hazards based on the risk assessment and existing staff, are found in the form of fatigue when carrying goods from the 1st floor to 4th floor or vice versa. Complaints of back pain, shoulder and sprains / dislocations are the most common complaints caused by this activity. In some rooms, there are complaints in the form of a table mismatch with chairs, tables that are too high and chairs that cannot adjust, causing fatigue in the limbs involved (hands, arms, back and legs). Sitting and typing for a long time and manual handling can cause musculoskeletal disorders, such as low back pain. This is in accordance with the results of research conducted by Dewi (2017) that unnatural work posture for a long time will cause complaints of pain in body parts, fatigue, product defects and even physical defects.

The biological hazard that occurs as a result of contact with body fluids is needle stick injury which can be a big problem if the used needle contains pathogenic microorganisms, such as hepatitis or HIV. The most staffs at risk here are laboratory assistants in the nursing laboratory. Another biological hazard is air pollution, where the exposure comes from rooms that use air conditioning. Non-routine air conditioning treatment will cause the air to contain microorganisms and cause respiratory diseases, such as work-related asthma (Sujoso, 2012). The presence of vector animals (cockroaches and rats) as well as cats in the work area will also affect the cleanliness and health of workers. The identified psychosocial hazards are the setting of working and rest hours which are actually in accordance with standards, but it has not applicated yet, especially the extra attention for night shift workers related to the schedule of changing shifts. Workload exceeds the work capacity of some staff will cause decreased or poor work performance. Work done in a monotonous manner will also lead to boredom, which in turn leads to a decrease in worker productivity. Researcher's recommendations related to psychosocial hazards are reviewing work hours and rest time arrangements, reviewing work productivity, dividing work in order the workload is evenly distributed among all staff so that no one feels the burden is heavier than others and provides education to workers regarding safety and occupational health (Simbolon, 2018).

Environmental hazards at Muhammadiyah University of Jember exist in several work units located on the 4th floor, where the height is a source of danger that affects musculoskeletal disorders. Working at a height requires preventive action so that all work activities can be carried out safely, so risk management / risk management is

needed (HSE, 2017). To avoid musculoskeletal disorders, workers should pay attention to posture when going up and down stairs.

Based on the results of the risk assessment, there are 6 high-risk activity processes, 13 medium-risk activity processes and 4 low-risk activity processes. Evaluation needs to be done whether the existing risk is acceptable or not, referring to the risk criteria established by the management of the organization. Acceptable risk is often termed as low as reasonably practicable, where the lowest level of risk is reasonable (Ramli, 2013). The risks are found within acceptable limits, so control measures must be taken.

The risk control is carried out for all hazards which are found in the hazard identification process by considering the risk ratings to determine the control priorities. Possible risk controls are engineering, administrative and personal protective equipment. This is in line with the theory of risk control that needs to be done to minimize and / or eliminate the risk of work accidents through the stages of elimination, substitution, engineering, administrative and personal protective equipment (Ramli, 2013).

CONCLUSION

Hazard identification in 11 activity processes in the general administration unit are found 21 potential hazards. In the laboratory unit, there are 6 activity processes with 11 potential hazards and in the personnel unit, 6 activity processes with 9 potential hazards are found.

There is the risk assessment in the work unit of the general administration division with a risk rating of 16, which is the activity of maintaining security in the campus environment that inherent in security duties. The highest risk rating with a value of 12 in laboratory units is found in nursing laboratories, namely in the process of preparing practicum activities using sharp tools / objects. While the risk assessment in the personnel unit, the highest risk rating with a value of 12 was found in working in the room using air conditioning and also in writing / typing on computers.

Risk control is determined based on the risk categories. The red zone is a high risk that must be controlled by eliminating the risk of hazards. Yellow zone where the risk is acceptable if security has been implemented and the green zone does not need control, but still adheres to SOP and the use of personal protective equipment. Implementing a work safety and health system that has been accommodated in Permenkes No. 48 of 2016 concerning office safety and health standards, including occupational safety, occupational health, office work environment health and office ergonomics.

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