Evaluation of the Occupational Health and Safety Implementation in the Pharmacy Laboratory of University X Surabaya

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ABSTRACT

Introduction: A Surabaya customer service company provides 24-hour call center services by implementing a work shift system, even though not all employees can adjust to work shifts. New employees must perform some adjustment or adaptation to their job. They must remain calm and patient in providing information and solving problems that customers convey, resulting in a very high mental needs of each call center agent. Monotonous activity and unpleasant customers trigger work stress on employees, which is marked by complaints of dizziness after work and emotional feeling. The objectives of this study was to analyze the correlation between years of works and work shifts with job stress in call center agents of the Surabaya customer service company. **Methods:** This study was a descriptive observational study with a cross sectional study design. The population in this study was all call center agents of a customer service company in Surabaya. The samples were 45 respondents, obtained through random sampling. Data were obtained from answered questionnaires and were analyzed using the contingency coefficient test. **Results:** Most call center agents had years of work of ≥ 1-3 years (53.3%). They also experienced very heavy job stress (51.1%). The results of the contingency coefficient was 0.436. The majority of call center agents experienced very heavy job stress, specifically those working in the morning shift (53.3%), day shift (40%) and night shift (60%). The results of data analysis using the contingency coefficient test was 0.338. **Conclusion:** There was a moderate correlation between years of work and job stress. There was a low correlation between work shifts and job stress.

Keywords: health, laboratory, safety, work

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INTRODUCTION

According to the International Labor Organization (ILO), every worker is obliged to observe and recognize all risk and hazard factors that exist in the workplace. This is due to a large number of workers who die due to accidents or illnesses at work. Work accidents are events that are not expected by every human being. Therefore, prevention of these incidents is very important to be done anytime and anywhere (International Labour Organization, 2013).

According to Law number 1 of 1970, occupational safety is a protective measure aimed at ensuring that workers and other people in the workplace are always protected with safety and health, and that every source of production can be used safely and efficiently (Government of the Republic of Indonesia, 1970). Meanwhile, based on Law number 36 of 2009, it is stated that occupational health efforts aim to protect workers to live healthily and be free from health problems and bad effects caused by work (Government of the Republic of Indonesia, 2009). Based on Law number 1 year 1970, a workplace is any room or field, closed or open, mobile or permanent, where laborers work, or where workers often enter for the purposes of a business and where there is a source or sources of danger. The workplace is all rooms, fields, yards and surroundings that are parts of or are associated with the workplace. Sources of danger can be identified in the workplace (Government of the Republic of Indonesia, 1970).

Educational laboratories, hereinafter referred to as laboratories, are academic support units in educational institutions, in the form of closed or open rooms, permanent or mobile in nature. The laboratories are systematically managed for testing, calibration and / or production activities on a limited scale, using equipment and materials

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based on scientific methods., especially in the context of implementing education, research, and community service (State Minister of Management and Bureaccration Reform Regulation, 2010).

Work in a laboratory cannot be separated from the possibility of occupational accidents or occupational diseases. This can happen if workers do not comply with the procedures and conditions applied to each of the existing tools and materials, and workers carry out their duties in ways that are risky. Work accidents in laboratories are very diverse, and the reasons can be due to chemical, physical, or biological factors. Chemical factors include the use of hazardous chemicals in laboratories that can be corrosive, explosive and so on. Many physical factors in the laboratory include needle sticks, noise, radiation, shattered glass, crushed equipment and others. Meanwhile, biological factors can come from virus, fungal or bacterial infections (Satrio and Fuadi, 2020).

In Indonesia, there have been many reports of work accidents in laboratories. One of the reports was an accident in the qualitative chemistry laboratory of the Faculty of Pharmacy, Universitas Indonesia on March 16, 2015. As a result of the incident, 14 students were injured due to broken distillation flasks that exploded when they were used for practicum (Virdhani, 2015).

In addition, there was also an explosion at the Laboratory for Hypersonic and Shock Wave Research of the Indian Institute of Science in Bengaluru, India which killed 1 laboratory assistant and left 3 injured (Taylor, 2018). In another case, an accident was found at the laboratory of the University of California, Los Angeles which caused the death of 1 laboratory assistant due to negligence while moving dangerous liquids. The laboratory assistant was known to only use gloves without a laboratory coat and glasses (Kemsley, 2018).

Of the accidents mentioned above, laboratory officers and users have a high risk of having occupational accidents and occupational health problems. Therefore, it is necessary for every personnel to have knowledge about occupational safety and health in the laboratory. In addition to knowledge, safety facilities are required to be provided in each laboratory, so in the event of an accident or emergency, intervention can be carried out quickly and precisely.

The Pharmacy Laboratory at University X is one of the new buildings. This laboratory building is used for various practical activities for both students and lecturers. Because of this, it is necessary to

Table 1. Laboratory Room Checklist Questions

Point	Questions	Checklist
1	Are work safety instructions and certifications taken into consideration in building facilities or evaluating laboratory rooms?	Yes
2	Does the room meet local and national requirements, including for necessary natural hazard prevention requirements? (e.g., earthquake)	Yes
3	Is the room free from all forms of obstructions and distractions?	Yes
4	Is the room clean?	Yes
5	Is there any structural damage to the laboratory floor?	Yes
6	Is the work space adequate to operate safely?	Yes
7	Are the floors and stairs of the building not slippery?	Yes
8	Are the changing rooms and corridors large enough for the movement of people and large equipment?	Yes
9	Are benches, furniture, changing rooms in good condition and clean?	No
10	Is the bench surface resistant to corrosive and flammable chemicals?	No
11	Is access to the laboratory area restricted to certain personnel?	Yes
12	Is the room constructed and protected from the ingress of insects and rodents?	Yes
13	Are all exposed explosive vapors and hot water pipes isolated and protected from all building personnel?	Yes
14	Is a backup power supply unit (for example a generator) available in case of a power failure?	Yes
15	Are hand washing stations available in each laboratory room?	Yes
16	Has a risk assessment been applied to all activities, equipment and facilities available to support the work performed?	No

Table 2. Storage Facility Checklist Questions

Point	Questions	Checklist
1	Are storage facilities, shelves, etc. properly arranged? (free from objects sliding, crumbling or falling)	Yes
2	Is the storage facility free from the accumulation of discarded items that are no longer used?	Yes
3	Can the refrigerator and storage area be locked?	Yes

guarantee safety in the laboratory. University X is an institution that specifically deals with a lot of facilities and infrastructure, so it must have standards that must be met in terms of safety and security in every laboratory in its work environment. Thus, each laboratory will carry out a checklist of safety and security facilities both prior to practicum activities or in a periodic scale.

Therefore, this study aims to identify the implementation of occupational health safety which is applied in the Laboratory of Pharmacy, University X Surabaya. The results of the observations and checklists can be a consideration whether the available facilities are adequate, or they still need some improvement.

Table 3. Sanitation and Personnel Facilities Checklist Questions

Point	Questions	Checklist
1	Is the room kept clean?	Yes
2	Are toilets and washing facilities (hand washing area) clean and separate for men and women?	Yes
3	Are hot, cold water, soap and towels provided?	Yes
4	Are changing rooms created separately for male and female staff?	No
5	Are accommodation for each personnel's clothes (e.g., lockers) available?	Yes
6	Is the noise level acceptable?	Yes
7	Is there a place to collect garbage that has been differentiated by type? (organic, inorganic and B3)	No
8	Is there a landfill for temporary storage of B3 laboratory results?	Yes

Table 4. Heating and Ventilation Checklist Questions

Point	Questions	Checklist
1	Is the work room temperature up to the standard?	Yes
2	Is ventilation available?	Yes
3	Are the filters in the ventilation system available and in good condition?	Yes
4	Is mechanical ventilation provided in fume hoods and biomaterials storage cabinets?	Yes

METHODS

This study used observational data collection methods. Based on the nature of the data analysis, this research was included in descriptive research and when viewed from the point of view of time this research was cross sectional. In this study the sample taken was the Pharmacy Laboratory of University X without conducting interviews with laboratory personnel.

The researchers only observed the object of research on the laboratory safety checklist in the agency that specifically handled this field, and the observation was carried out in August 2020. Primary data were taken by observing the object of research, namely the Pharmacy laboratory of

Table 5. Exposure Checklist Questions

Point	Questions	Checklist
1	Is the illumination sufficiently adequate at 300-400 lux?	No
2	Is local lighting available on the workbench?	Yes
3	Is the lighting in all areas adequate, not dark or flickering in all rooms and corridors?	No
4	Are the lighting colors adequate / balanced?	Yes

Table 6. Laboratory Safety Checklist Questions

Point	Questions	Checklist
1	Has a qualitative risk assessment been carried out to detect and measure the security protection system in the laboratory area?	No
2	Are accident and risk response design parameters in place?	No
3	Is the entire room locked securely when not in use?	Yes
4	Are door and window glass classified as shatterproof?	No
5	Are entire rooms containing hazardous chemicals and expensive equipment locked away when not in use?	Yes
6	Is access to space, equipment and materials controlled and registered?	Yes
7	Is the eyewash available and in good condition?	Yes
8	Is a safety shower available and in good condition?	Yes
9	Is there an MSDS (material safety data sheet) / MSDS?	Yes

Table 7. Service Checklist Questions

Point	Questions	Checklist
1	Are hand washing stations, water, electricity and gas openings available to work safely in each laboratory?	No
2	Are inspection and maintenance of all fuses, lamps, cables, pipes etc. properly carried out?	Yes
3	Are all damage repairs addressed and completed in a non-protracted time?	Yes
4	Are engineering and maintenance services available with experts in their fields?	Yes
5	Do the experts or laboratory assistants have knowledge about the hazards of chemicals and the safety of working in the laboratory?	Yes
6	Is the access of engineering and maintenance personnel to every area of the laboratory controlled and recorded?	Yes
7	Are cleaning services available?	Yes
8	Are information technology services available and safe?	No

Table 8. Fire Prevention and Protection Checklist Questions

Point	Questions	Checklist
1	Is a fire alarm system available?	Yes
2	Is the APAR available in good condition?	Yes
3	Are fire doors in good shape?	Yes
4	Is the fire detection system in good condition and regularly tested?	Yes
5	Is the fire alarm system easily accessible?	Yes
6	Are there any signs for emergency exits and evacuation routes?	Yes
7	Are these signs clearly visible to all personnel?	Yes
8	Are the emergency exits free of all items covering them?	Yes
9	Are the emergency exits locked when not in use?	Yes
10	Is access to emergency exits structured not to pass through high hazard areas?	Yes
11	Is the emergency exit connected to an open area outside the building?	Yes

University X. The list of questions used to observe the observation was taken from the OHS department of University X which in this case handled the field. Meanwhile, secondary data were obtained from documents that exist in the agency. Both data were supported by scientific literature and books in the OSH laboratory. Following this, the data were analyzed based on statutory regulations, standards applicable in universities, and literature that can be accounted for academically. From the results of the analysis, conclusions and recommendations will be drawn for related agencies to improve the quality of the implementation of occupational health safety, especially in the field of OHS laboratories.

RESULTS

Based on the Table 1, it is known that there are 16 questions related to the laboratory room. Of the 16 questions, there were 2 questions that are still found to have no answers for different reasons. In the 9th point of the question, it was found that there is no dressing room whereas in the 10th point of the question, it was found that the bench surface cannot stand being exposed to fire. Moreover, there is no risk assessment for all activities, equipment and facilities.

There are 3 questions related to storage facilities in the laboratory safety and security checklist. From the three questions mentioned above, it was found that all three obtained good answers.

Regarding personnel facilities, it is known that there are 9 related questions. Among these questions, 2 points of the questions received no answer. In this section, the 4th point of the question is related to the 9th point of the question in the laboratory room checklist. Thus, the question had no answer. Meanwhile, from the 8th point of the question, it was found that there is still no special place to collect waste based on its type.

Table 4 is a checklist of questions related to heating and ventilation. This list has 4 related questions. From these four questions, it is known that the answers are quite good. The question in point 4 shows that only biometal material storage cabinets are available, and there is no fume hood.

The fifth checklist is related to the lighting with 3 related questions. Based on the measurements using a luxmeter, it was found that the lighting in the laboratory is only around 150 lux with the lowest number especially in lighting obstructed by concrete pillars. From this result, the overall lighting in the area is inadequate. However, no abnormal light was found.

The next checklist questions are related to laboratory safety. There are 9 questions related to this. In the 1st point of the question, it was found that there is no risk assessment to detect and measure the security protection system. The same result is also found in the 2nd point of the question. The design parameters for the response to accidents and risks have also not been implemented.

There are 8 questions related to the service. In the 1st point of the question, it was found that there is still a potential or possibility of injuring workers because the outlet available on the floor is too prominent. In the 8th point of the question, it was found that currently there is no information technology service.

Table 8 provides a list of fire prevention and protection checklist questions. There are 11 related questions. From the eleven questions, it was found that all the questions show that all conditions are good or available.

DISCUSSION

Laboratory room

Safety guidelines and certifications are important considerations in building construction. Every contractor who carries out a building construction project in the University X area must have the knowledge and permission of the related institution. Existing violations will be followed up with a warning letter with the heaviest sanction being a termination of employment. The principle of work safety that is enforced includes a building design in accordance with standards in case of emergency situations such as fires and earthquakes (Regulation of the Minister of Public Works, 2006).

The results of observations at this location show that the spatial layout is deemed adequate, and there are no obstacles, especially at the entrance and the hallway between work tables. The available hallway has an area of about 1 meter. This is in accordance with existing guidelines stating that a minimum hallway area is 600 mm, and there should be no obstructions along the corridor (Minister of Health of Canada, 2004).

The benches and tables in the laboratory are in good condition, and there is no damage. However, there is no changing room, which might be related to the fact that there is no need to change special clothes, and the personnel only need to wear a laboratory coat. The material used for the table surface is glass which is corrosive resistant, but the material for the table is made of wood which is not fire resistant. This certainly requires fire protection efforts. The personnel allowed to enter the laboratory area are instructors, students and guests who have already obtained permission to enter the laboratory.

In addition, it was also found that the laboratory is kept clean, the floor has no structural damage, and the floor is not slippery. The floor in the room is known to be made of vinyl which is non-slip and easy to clean in the event of a chemical spill. The workspace is neatly arranged, and there is no table that is more prominent than other desks. The corridor leading to the laboratory is also quite wide, about 2 meters and the area has exceeded the minimum requirement of 1.8 meters (Regulation of the Minister of Health, 2010).

The laboratory room is also considered safe and protected from the dangers of rodents while the cleanliness of the room is maintained. Moreover, the existence of regulations does not allow laboratory assistants to eat in the room. This is consistent with previous research that stated that the condition of a place and the behavior of its inhabitants are statistically related to the presence of rodents living in that place, including other conditions that can cause health problems (Katulistiwa and Lestari, 2015).

At the back of the laboratory there are 2 washbasins equipped with soap and tissue. Also, it is known that all types of work allow workers to be exposed to dirt, dust and even microorganisms. Carrying out hand washing activities, therefore, needs to be done to avoid the entry of danger into the body that can cause health problems. Previous research found a relationship between hand washing habits and the incidence of diarrhea (Rompas, Tuda and Ponidjan, 2013). The same thing also happened to school-age children in Jember district where there was a relationship between hand washing behavior and the incidence of diarrhea (Wantiyah, Purwandari and Ardina, 2015).

In addition, it was found that this laboratory has never conducted a risk assessment. Risk assessment is carried out to determine the consequences of potential hazards to be used as a basis for taking corrective actions to prevent incidents due to these hazards and to prioritize control of all types of risks, consequences that may occur in severity, frequency of events and methods of prevention. Thus, risk assessment is a very important thing to do. Yet, it has not been done because the university is currently in the process of moving from the old building to the new building, and there is no definite plan in the

room arrangement. Previously, a risk assessment was carried out in the old building.

Risk management needs to be done by assessing the risks it poses. Risk management can be carried out through various steps such as mitigation, transfer or even acceptance of the risk itself. However, its implementation must be adjusted to the readiness and ability to bear the risk and the intensity level of the risk itself (Rahardjo, Hafizh and Prihanton, 2019).

In addition, risk management is an important thing to do and is also related to the budget that will be spent as immeasurable cost where things like accidents might occur if ineffective risk management is not carried out. Risk management efforts that can be made to minimize the incidence of fire include minimizing processes associated with combustion, replacing combustion-associated processes with a lower combustion power which has a safer reaction, reviewing processes that require combustion reactions, providing a special area with a special construction with low or no flammability, and controlling the work with standard operating procedures (SOP), training, supervision, and behavior modification (Ramadhan and Nalendra, 2019).

Storage Facilities

The cabinets and storage lockers in this laboratory are neatly arranged and closed. This is done in order to minimize falling items. In addition, there are no piles of items that are placed too high, so the possibility of being crushed by them can be avoided. Unused items will be put in the warehouse. If the item is a broken tube or beaver, it will be immediately disposed of into the glass waste bin. At the back there is a refrigerator and a closed chemical storage area that can be locked when not in use. This is good and in accordance with internal regulations , considering that if goods are stored in a bad condition, they will cause safety problems for workers.

In previous research, there were accidents recorded in the Education Laboratory that occurred due to being exposed to a chemical spill of 66.66%, falling or slipping of 6.66% and being hit by broken glassware of 3.33%. These accidents are caused by inadequate storage facilities. Therefore, storage facilities are needed in a laboratory room to make sure everything is tidy so as to avoid accidents (Cahyaningrum, 2020).

Sanitation and Personnel Facilities

In the laboratory there is no changing room because there are no rules or procedures that require laboratory personnel to change into special clothes in carrying out practicum activities, and it is sufficient for the laboratory personnel to only wear laboratory coats.

There is also no special room for eating because laboratory users are not allowed to eat or drink in the laboratory. In addition, the laboratory is also not a practicum location that is usually used by students every day, and therefore there is no special dining location provided. Students can eat or drink before or after practicum outside the laboratory area. This is done so that the laboratory room is always in a clean condition.

When measured using an audiometer, the noise level in the laboratory was 65 dB. When referring to the applicable regulations, the noise level in the laboratory is still below the specified threshold value (NAB), which is 85 dB. It is hoped that this can be maintained so that there is no hearing loss due to noise (Minister of Health Regulation, 2016).

Noise in the workplace can cause hearing loss and systemic disturbances, which in the long term can cause health problems and decrease labor productivity. Therefore, it is necessary to do early monitoring and detection for prevention (Gunara, 2011). There is a relationship between noise and worker conditions (Carolina, 2016). The same thing was noted in research conducted at PT. X Surabaya, suggesting that there was a significant relationship between noise and work stress (Candraditya and Dwiyanti, 2017). In addition to hearing loss, exposure to noise that exceeds the threshold value (> 85 dBA per day) can also be one of the causes of increased levels of work stress which then has an impact on increasing blood sugar levels (Sumardiyono *et al.*, 2019).

Based on the results of the observations made, it was found that the available trash bins have not been separated into organic and inorganic waste bins. The trash cans are only plastic without a lid. This is certainly not in accordance with the applicable regulations, which states that the sorting of waste types must be differentiated in terms of packaging or differentiated forms and must use closed containers (Minister of Public Work Regulation, 2013). The gradual structuring and procurement of goods to complement the facilities in the laboratory until it is fit for use is the reason why the trash bins in this

laboratory room have not been separated. According to waste management, which includes waste separation and reduction activities, it is mandatory because it is considered an environmentally friendly activity.

Meanwhile, temporary shelters (TPS) to temporarily accommodate hazardous toxic materials have been provided in the form of jerry cans for liquid waste and iron drums for used glass shards. When the temporary shelter is full, it will then be lowered using a freight elevator to the shelter located on the ground floor, and then the processing is handed over to a third party.

Hazardous and toxic materials waste can cause harm to the environment and also have an impact on public health and other living things if disposed of directly into the environment. In addition, hazardous and toxic waste has characteristics and properties that are not the same as waste in general, mainly because it is unstable, reactive, explosive, flammable and toxic in nature, so it is necessary to ensure that the flow of the waste management does not cause problems or disturbances to safety and health (Purwanti, 2015).

Through the management of hazardous waste management in the form of separating expired chemicals and damaged packaging and its management, it is expected that it is able to minimize the potential for contamination of stored chemicals and reduce the generation of waste that is disposed into the drain disposal (Sulman and Irawan, 2016).

Heating and Ventilation

Based on the observations made, the room temperature was 20oC. This temperature is in accordance with the permitted temperature provisions in the laboratory, which is in the range of 20-25oC. This aims to keep laboratory equipment from being damaged and to keep humidity from getting too high. In the laboratory room, there are no curtains on every window. However, it is circumvented by the installation of a plastic film. This aims to reduce exposure to direct sunlight and keep the laboratory temperature within the permitted limits.

The laboratory room ventilation comes from the air conditioner. The air conditioner used is central air conditioning. This is in accordance with the applicable regulations that ventilation in the laboratory room must be provided either in the form of windows or air conditioning (Minister of Health Regulation, 2013) . The air filtration system is installed and works properly. This allows laboratory personnel to maintain good and safe air conditions. This laboratory is only used for the observation of natural materials, so there is no installation of a fume hood system. However, there is a storage cabinet for biomaterials that can be closed when not in use.

Lighting

Based on measurements using a luxmeter, it was found that the lighting in the laboratory was around 150 lux. The lowest figures are mainly in lighting obstructed by concrete pillars. Of course, this value is not in accordance with the applicable provisions based on internal university regulations and statutory regulations. Based on the Minister of Health Decree (2016), lighting in a laboratory with a precision measurement room requires 500 lux of lighting. In addition, the lighting is still less than the requirements in the checklist provided, namely 300 - 400 lux. Thus, overallthe lighting level in the laboratory area still does not meet the standard and is inadequate for these activities. However, there are no abnormal light sources found such as blinking or turning off in all rooms and corridors, and the selection of light colors is good enough and not too dazzling (Minister of Health Decree, 2016)

There is a very strong relationship between light intensity and eye fatigue (Wiyanti and Martiana, 2015). Another study conducted in Polewali Regency stated that lighting below 100 lux had a relationship with eye fatigue (Jasna and Dahlan, 2018). There are negative impacts that arise due to poor lighting, including disturbances in the eyes of workers, for example eye fatigue, eye irritation, blurred vision, and difficulty seeing work objects carefully , as well as the effect of heat on the work environment of the production unit due to the incorrect choice of lamp types (Wulandari, 2010).

In addition, there is a very strong influence and relationship between lighting and mental workload. Reviewing the research that has been done by previous researchers, it was found that lighting has a serious impact that must be overcome, so it is necessary to improve the lighting of the laboratory space (Widarobi, Yadi and Mariawati, 2013).

Laboratory Safety

When the activities carried out in the laboratory have been completed, all doors will be locked to avoid any unwanted events such as theft of laboratory equipment. Windows and doors are not

classified as anti-breakage nor are they classified as fire-resistant because the doors are made of wood. Practical activities, especially the use of tools and the taking of materials, are well controlled by the laboratory assistant, so that if there is damage or loss, it will be immediately detected and processed according to existing regulations.

This laboratory is equipped with safety equipment such as eyewash and safety shower. This equipment is considered very important in a laboratory, especially for those dealing with chemicals. This is because the job is prone to the risk of being splashed with chemical liquids. Thus, if this happens, the first action that must be taken is to water the eye or limb that is splashed so that there is no heavier effect. From the results of observations, the location of the placement of the equipment is also in accordance with existing regulations, in which the travel time from the laboratory is not more than 10 seconds (American National Standards Institute, 2014).

The complete material safety data sheets have been neatly recorded and can be read by any laboratory user. This is in accordance with the regulations that stipulate that every laboratory that uses chemicals in its work process is required to complete these chemicals with a material safety data sheet (Minister of Industry Regulation, 2009). To carry out a chemical research activity in the laboratory, researchers are required to read a MSDS which is useful for knowing the potential for chemicals in the form of hazards to health, flammability, material reactivity and other special hazards (Yudantoro, Sulistiyo and Insani, 2013).

Service

Based on the results of the observations made, the electrical installation, hand washing place and water are functioning properly. However, there are some floor outlets that protrude too far upward, resulting in a possible tripping hazard to laboratory personnel. This indeed can be very dangerous, especially when the electricity is on as it can result in the possibility of electric shock. There needs to be an effort to repair or eliminate it permanently so that unwanted events can be avoided.

Inspection and maintenance of supporting equipment in the laboratory is carried out properly and regularly, so that if there is an abnormality, it can be immediately identified, and efforts to repair it can be taken as soon as possible. Maintenance of supporting facilities in the laboratory is carried out by a team of facilities and infrastructure, and if special expertise is needed, skilled workers will be brought in based on the desired field. Every periodic maintenance is always recorded so that it can be monitored continuously.

Given the dangers and consequences of activities in the laboratory, laboratory assistants are also provided with training on chemical hazards and safety. Research conducted at PT X Indonesia stated that knowledge is a very important domain for the formation of a person's behavior, in this case related to the handling of chemicals (Haqi and Alayyannur, 2020).

Most work accidents are caused by human negligence since people do not pay attention to the aspects of work safety, and as a result they can harm themselves and others. Human negligence occurs as a result of a lack of understanding of work safety. Therefore, education and training for related laboratory assistants certainly need to be done (Lasia, Gunamantha and Budiada, 2017).

Based on observations made in the laboratory, it is known that the emergency door is closed when not in use, there are no blocking items, access to the emergency exit does not pass through areas with high danger, and the emergency exit is connected to an open area outside the building (Government of the Republic of Indonesia, 2005). Emergency stairs are also available because the location of the laboratory is at an altitude, but the emergency stairs are not equipped with rubber coatings and directions (Indonesian National Standard, 2000).

Fire Prevention and Protection

Based on the results of observations made in the laboratory, there is an alarm system installed on each floor of the building. An alarm will sound when someone presses the alarm button in the upper left corner of the hydrant box. Alarms are activated during emergencies such as a fire to alert visitors to the building, especially for the laboratory personnel to immediately carry out evacuation measures. In general, a fire is known when the fire has started to get bigger or black smoke has risen out of the building, which can cause huge losses (Kali, Tarigan and Louk, 2016). In addition, considering the vulnerability of fire incidents, it is very necessary to have a security system in the building that is able to detect fire events early so as not to cause material loss and casualties. Maintenance and alarm checks are carried out once a month and recorded based on the available checklist.

It is known that fire extinguishers have been installed in the laboratory. Inspections and checklists of light fire extinguishers are carried out periodically every month to find out whether the light fire extinguishers are still in good condition, sealed and not expired. Fire extinguishers that are installed contain 3 kg of powder. This material is in accordance with the existing fire class because in this laboratory area there is a table made of wood and paper which if burned will be classified as a class A fire. B3 waste which will cause a class B fire , and electrical installations from microscopes in the form of an electric short circuit which will cause a class C fire. Therefore, the material from the available light fire extinguishers is already in accordance with the existing legislation. Other provisions require that the installation of light fire extinguishers should be 15 meters apart from each other. Based on the measurements made, the distance between light fire extinguishers is in accordance with this provision. In addition, other provisions require that the height of the light fire extinguisher installation is not less than 125 cm above the floor and that there should be no obstacles around it. However, based on observations and measurements made, it was found that the height of the light fire extinguisher installation is only about 70 cm above the floor, and there are items blocking the light fire extinguishers. In addition, there is no sign of a triangle which is an indication for a light fire extinguisher as stipulated in the statutory provisions. This indeed needs to be evaluated in the interests of personnel safety by complying with existing regulations (Minister of Manpower and Transmigration, 2010)

CONCLUSION

Pharmacy Laboratory of University X has met most occupational safety and health requirements in the laboratory. However, there are several things that need to be paid attention to. This laboratory needs to carry out a risk assessment in the laboratory room immediately considering that the laboratory is one of the places that has a large enough potential hazard. Moreover, as a place where there are many activities that require accurate lighting, this laboratory room still has a low value of lightning, so it needs to be corrected. Some repairs should also be done to the electrical installations that are still protruding on the floor where an accident might occur.

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