

## THE ANALYSIS OF DISASTER PREPAREDNESS SYSTEM IN MULTI-STOREY BUILDING AT AL QODIRI ISLAMIC BOARDING SCHOOL, JEMBER

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### ABSTRACT

Al Qodiri led by KH. Muzakki Syah is one of the largest Islamic boarding schools (Pesantren) in Jember Regency. The number of students is 3000, with details of 1000 male and 2000 female, while the board of boarding schools itself is 101 people with 51 male administrators and 50 female administrators (Ponpes Al Qodiri, 2019). The number of students, which is almost a thousand people, makes Al Qodiri Islamic Boarding School build a multi-storey building or flats to facilitate the activities of its students. This 3-storey building which is inhabited by a large number of students needs to be implemented as a means of saving lives for its residents because it has potential dangers and emergencies. In addition, the lack of knowledge about disaster emergency response makes the risk of security and safety problems even greater. This study aims to analyze the needs of an emergency preparedness and response system in a multi-storey building at the Al-Qodiri Islamic Boarding School, Jember. This research is categorized as qualitative research with case studies, while the data analysis uses the Colaizzi technique. The research sample was taken by purposive sampling of 5 respondents. The results of data analysis show that there are several potential hazards of multi-storey buildings in the Al-Qodiri Islamic Boarding School, including the potential for physical hazards in the form of a humid room, lack of lighting, and lack of ventilation and feels stuffy. The potential chemical hazards that exist in the form of smoke from burning various kinds of waste, especially clothes, of course, this can cause air pollution and can endanger health and is a potential chemical hazard.

**KEYWORDS:** Disaster Preparedness, Disaster Emergency Response, Islamic Boarding School, Multi-Storey Building.

### INTRODUCTION

Pondok Pesantren (Islamic boarding school) is one of the Islamic education in Indonesia which has its own characteristics. Jaelani (2015) provides that pondok pesantren is a combination of two words for pondok and pesantren, the term pesantren is lifted from the word *santri* which means pupil or also letters because in this pesantren students (*santri*) first recognize letters, while the term pondok comes from the word *funduk* (in Arabic) means a house. Lodges in Indonesia, especially on the island of Java, are more similar to lodgings in a hermitage, namely simple housing plots in the form of rooms which are dormitories for students. Where this will create problems, especially when a natural disaster occurs, namely the possibility of difficulty accessing emergency response services for natural disasters.

In East Java, especially in Jember Regency, there are many *Pesantren*, one of which is the Al Qodiri, The Islamic boarding school under the care of KH. Muzakki Syah is one of the largest in Jember Regency. The number of students is 3000, with details of 1000 male students and 2000 female students, while the board of the boarding school itself is 101 people with 51 male student teachers/administrators and 50 female teachers/administrators (Ponpes Al Qodiri, 2019). The number of students is nearly a thousand people, making the Al Qodiri Islamic boarding school build a multi-storey building or flats to facilitate the activities of its students. One of the buildings, which is a 3-storey building which is inhabited by a large number of students, needs to be implemented as a means of saving lives for its residents because it has potential dangers and emergencies. In addition, the lack of knowledge about disaster

emergency response makes the risk of security and safety problems even greater.

Based on the explanation above, the Al Qodiri is obliged to make an Emergency Preparedness and Response Plan to anticipate an unexpected emergency, such as two previous incidents. Seeing the importance of this emergency response system, the researcher intends to carry out an analysis and plan the needs for an emergency preparedness and response system in a multi-storey building in the Al-Qodiri Islamic boarding school, Jember.

## METHOD

This research is a qualitative research with a case study approach. The sampling technique used was purposive sampling. The number of samples taken in this study were 5 respondents. This research was conducted at the Al-Qodiri Islamic Boarding School, Jember. The data analysis technique used in this study is the Colazzii Technique.

## RESULT AND DISCUSSION

### 1. Identification of the Potential Hazards of Multi-Storey Buildings

The results of the research on five informants stated that there were five potential dangers that had and might occur in Islamic boarding schools. The potential hazards are physical, chemical, biological, natural and electrical / mechanical disasters. Most of the respondents said that natural disasters were the hazard with the highest risk, followed by chemical, biological and electrical hazards. The potential hazards as stated in OHSAS (2007) are divided into several types, but what respondents in this study only knew about five, namely the potential for physical, chemical, biological, natural and electrical hazards.

#### a. Physical Hazards Potential

Most of the informants stated that in terms of potential physical hazards, temperature is one of the problems found in the Al-Qodiri Islamic boarding school, namely the condition of the room which tends to be damp and lacks lighting or ventilation so that the room sometimes feels stuffy, as in the following informant's statement :  
 "...it's just comfortable in the room, but if it rains sometimes it is damp and feels stuffy too" (#5, 20 years old)

According to OHSAS (2007), less or too bright light can damage the eyes. Often working in dim light can cause eye discomfort in the form of eye fatigue or headaches. Other lighting that can pose a risk to the health of workers is those who work on the beach or in the middle of the sea as a result of being exposed to direct sunlight and lasting a long time.

In addition, respondent #4 who is also a student, stated that the potential physical danger he experienced was the

lack of ventilation in his room. This is illustrated by the following informant's statement:

"... it seems that there is nothing like that but sometimes I feel that the ventilation is lacking, because there are many residents in this room" (#4, 19 years old)

This is in accordance with OHSAS (2007) that there are several dangers that come from physical factors, among others, first, noise. Noise is all unwanted sound that comes from the means of production. Noise is often overlooked as a health problem, but it is one of the main physical hazards. Second is vibration. Vibration is the movement back and forth, bouncing up and down and forward and backward. Vibration can negatively affect all or certain parts of the body. The third is lighting. Workplace lighting must meet the requirements for carrying out work activities. Lighting is needed to increase productivity and reduce errors. If the lighting is not in accordance with the needs of the worker, the worker must bend over and focus on the sight so that it is uncomfortable and can cause problems in the back, eyes in the long term and can interfere with the work process.

Physical hazards are a type of hazard related to occupational health such as noise, extreme temperatures, ionizing radiation, non-ionizing radiation, extreme pressure, and vibration, all of which are physical stresses on the human body.

Physical hazards can be found in the work environment of one or more operators. Therefore, it requires handling of physical hazards to minimize or prevent them. A comfortable work environment is needed by humans to be able to do activities optimally and productively. In addition, the work environment must be handled and designed properly. This is because the bad influence of the work environment will have a negative impact on the operator. it can be said that the work environment has a direct impact on activities.

#### b. Chemical Hazard Potential

Respondent #5 stated that the potential hazard that has also been experienced is chemical hazard potential. This is reflected in the category, namely the existence of small fires and burning of garbage, of course, this can cause air pollution and can endanger health and is a potential chemical hazard. This can be seen from the following informant's statement:

"...sometimes the trash was burned. clothes, underpants that don't know the owner that fell or left in the bathroom are thrown in the trash and usually burnt most sometimes if not thrown away they can smell..." (#5, 20 years old)

In addition, informant #4 also stated that there had been a fire but it was not a big fire but the effects of the fire could be felt, as in the following informant's statement:

"...there was a building fire ... but not a big one ... and when the garbage is burning the smoke can enter the room and make shortness of breath" (#4, 19 years old)

The same research conducted by Seinda (2016) shows that the findings of hazards in the boiler operating area are noise, hot weather, sparks, bumps, pinched hands, water vapor leaks, high pressure, electric current, contact with hot steam pipes, spilled oil, hit with NaOH liquid, and slipped and fell from a height. In risk control, there are 6 hazards in the category of very good control values, 3 hazards in the category of control values that are implemented properly, and 3 hazards in the category of control values are implemented quite well. boiler hazards at Indonesia Power Unit Corp, Semarang, which has a high risk due to the danger of water vapor leakage and high pressure.

Chemicals that enter the body through food or drinks that have been contaminated with chemicals. Toxic substances that enter the body through digestion and cause the digestive system to be disturbed by these chemicals. Absorption into the skin can also be a potential chemical hazard. Chemicals enter the body through skin that is injured or abrasions or injections into the body. This school is advised to immediately make trash cans far from student residences where the trash can not interfere with student activities while in the room and reduce the risk to a low limit.

#### *c. Biological Hazards Potential*

Respondent #2 states that a potential hazard that has also been experienced is a biological hazard. This is illustrated by the category of Islamic boarding schools providing sinks for washing hands in handling the virus, namely corona and there are also students who are exposed to bacteria, namely scabies. This can be seen from the informant's statement as follows:

*"in my opinion, the current biological problem for the virus is only the flu, but when talking about corona, thank God the students and administrators did not get the virus ... and treatment has been provided such as a potable sink ... in every place in front of the building to deal with the virus ... and for scabies ... I don't know the medical term ... what I know is that there are still scabies affected .. and to deal with it, treat it using the ointment that has also been provided".* (#2, 40 years old)

The results of interviews conducted with #2 stated that biological hazards such as viruses are very dangerous in handling, according to respondents, prevention has been carried out related to a worldwide virus outbreak by providing sinks and treatment of scabies with ointments that have been provided by Al Qodiri.

In addition, informant #3 also stated that there are still those affected by scabies in a biological danger that can be felt, as in the following statement:

*"There are biological hazards such as scabies sir, yes because we bathe in the same tub sir, treated with ointments"* (#3, 42 years old)

The same research was carried out by Nur (2018) research on important aspects in an industry that ensure the personnel are free from work accidents and cause reduced productivity. In the pharmaceutical industry, potential hazards that can occur are physical, chemical, biological, and ergonomic hazards. Physical hazards are hazards related to light, temperature, noise, and others. Chemical hazards are hazards caused by chemical substances exposed to personnel. Biological hazards are caused by viruses, bacteria, fungi, and other pathogens. Meanwhile, ergonomic hazards are hazards related to physical and psychological workers.

The way to reduce the possibility of a hazard that occurs is by risk assessment and hazard control based on the type of hazard. In this way, it is hoped that the number of unwanted occurrences can decrease and always wear a mask that has been provided by the management, always keep a distance of 1 meter in handling the virus and for scabies in students, preventive measures are taken immediately with routine checks on every student who the potential for scabies.

#### *d. Natural Disaster Hazard Potential*

Informant #5 stated that the potential danger that has also been experienced is the potential hazard of natural disasters. This is illustrated by the category, namely the frequent occurrence of earthquakes that hit Jember. This can be seen from the following informant's statement: *"...here (Jember) there are frequent earthquakes, but during my time here I never damaged buildings. It's just that there are cracks in the wall which worries me..."* (#5, 20 years old)

In addition, informants #2 and #3 also stated the same thing, even though earthquakes that occur frequently hit Al Qodiri, so far they have never had any damaging or life threatening effects, as in the following statement: *"...Indeed, earthquakes often occur ... but they do not cause serious damage, such as collapsing buildings, ... yes ... thank God the important thing is no casualties..."* (#2, 40 years old)

The territory of Indonesia is located in a tropical climate with two seasons, namely the dry and rainy seasons, characterized by quite extreme changes in weather, temperature and wind direction. These climatic conditions combined with the surface topography and rock conditions that are relatively diverse, both physically and chemically, result in fertile soil conditions. On the other hand, this condition can cause some bad consequences for humans such as the occurrence of hydrometeorological disasters such as floods, landslides, forest fires and drought. As time progresses and human activities increase, environmental damage tends to get worse and triggers an increase in the number of incidents and intensity of hydrometeorological disasters (floods, landslides and drought) that occur one after another in many regions in Indonesia (BNPB, 2018).

The results of research by Alif (2019) show the level of earthquake danger in Bekasi Regency and City from historical earthquakes that have occurred and earthquake scenarios originating from the extension of the Baribis fault which may occur in the future. The researchers' advice is to immediately rejuvenate the building because every building that is affected by the earthquake, the resilience of the building that was originally sturdy will be prone to collapse, or destruction because the building construction foundations have changed and it can be life-threatening if a larger aftershock occurs.

#### *e. Electrical / Mechanical Hazards Potential*

Most of the informants stated that in terms of the potential for physical hazards, electrical hazards can also be a potential risk, although there has never been a dangerous incident from an electric hazard, most of the participants said that electricity is also very potential, as in the following statement:

*"...electricity in my opinion ... also dangerous. like if the cable is not in place ... if the incident was hit by an electric shock ... yes ... there is, it's just not reported"* (#5, 20 years old)

Informant #5 said that another potential hazard that may present a great risk of harm is electricity hazard. As stated in OHSAS (2007), hazards originating from electrical energy can cause various hazards, for example, fire and electric shock. In the work environment, there are many dangers found from the electricity network and work equipment that uses electricity. The impact of injuries caused by electric hazards includes the danger of currents flowing through the human body, the danger of being exposed to electric shocks, and the length or duration of being exposed to electric shocks.

The effects of electric shock include stopping heart function and inhibiting respiratory function, while the heat generated from the current can cause the skin or body to burn at the point where the current enters the body. Spontaneous movements caused by exposure to an electric current can cause other injuries such as falling in some cases can cause neurological disorders and even result in death.

#### *1. Emergency Preparedness and Response System*

The results of interviews conducted with five informants obtained several points regarding disaster emergency preparedness and response. Based on the disaster preparedness framework developed by the Indonesian Institute of Sciences (LIPI) and the United Nations Educational, Scientific and Cultural Organization (UNESCO) in 2006, community preparedness in the face of earthquake and tsunami disasters is grouped into five parameters, namely knowledge and attitudes (knowledge and attitude), emergency planning, early warning systems, resource mobilization capacity, as well as policies and guidelines.

#### *a. Knowledge and Attitude*

Most of the informants said that they know and understand the importance of emergency preparedness and response to disasters that may occur in multi-storey buildings. This is reflected in the category, namely knowing and understanding that if a natural disaster occurs, you must always be aware of all the bad possibilities that occur and how to deal with and overcome them. This can be seen from the following informant's statement:

*"...before and after a disaster, for example an earthquake, we must always be prepared for all the bad possibilities that occur and how to deal with them...."* (#1, 75 years old).

Informant # 3 who is also a boarding school administrator stated that he understands what if an earthquake occurs. This is illustrated by the following informant's statement:

*"...run to the open spaces"* (#3, 42 years old)

According to LIPI-UNESCO / ISDR (2006), knowledge is a key factor in preparedness. The knowledge that individuals and households need to have about earthquake disasters, namely understanding about earthquake disasters and understanding about disaster preparedness, includes understanding of appropriate self-rescue measures when a disaster occurs as well as actions and equipment that need to be prepared before a disaster occurs.

Researcher's suggestion to respond to this is that if possible, trainings are held for students on disaster preparedness in multi-storey buildings or at least how to use fire extinguisher.

#### *b. Emergency Planning*

Most of the informants stated that an emergency response plan actually exists but has not been written down and its implementation is still not optimal. This is reflected in the category, namely there is an emergency response plan but the implementation is not optimal. This can be seen from the following informant's statement:

*"There is an emergency response plan, but only verbally during the foundation meeting, there is no written documentation yet...."* (#3, 42 years old)

The results of the interview, informant #3 stated that the emergency response plan and what things needed to be done during the disaster were already known and understood by the boarding school as well as by the students, but the implementation was not optimal and there was no written guide.

Observations and interviews that have been conducted by researchers on the emergency response plan at Al Qodiri Boarding School on informant #2 with the following statement:

*“ there is .. but if the document is .. I don't think so, it's just a direction when an earthquake or fire occurs”... (#2, 40 years old)*

According to Andinawati (2020), disaster emergency response planning is a very important activity in disaster management, because this activity is an activity before a disaster occurs which is intended to anticipate so that the impact can be reduced. In the coastal area it can be done structurally or non-structural. Structurally, it can be done by making technical efforts both naturally and artificially such as loading breakwaters and planting mangroves for tsunami mitigation, construction of embankments, diversion canals, flood control gates, river normalization, and polder systems in flood-prone areas, groynes in eroded coastal areas. , and manufacture of disaster-resistant structures. Meanwhile, non-structural mitigation is a non-technical effort related to adjustment and regulation of human activities to be in line with and in accordance with structural mitigation efforts or other efforts..

#### *c. Warning System*

Most of the informants stated that there was no early warning system implemented at Al Qodiri Islamic Boarding School regarding disaster emergency response. This is reflected in the category, namely that there is no early warning system implemented by Al Qodiri. This can be seen from the following informant's statement: *“there seems to be no self warning system yet,....”* (#3, 42 years old)

Early Warning System is a series of systems that functions to notify natural events. This early warning system will notify upcoming disasters or other natural events. Early warning to the public of a disaster is an act of providing information in a language that is easily digested by the community. In a critical condition, in general, early warning which is the delivery of information is manifested in the form of sirens, bells and so on (BPBD Jakarta).

For the people of Indonesia, the Early Warning System is very important considering that our country is a country that has a high threat of natural disasters. With this early warning system, it is hoped that appropriate measures can be developed to prevent or at least reduce the impact of natural disasters on the community. Delays in dealing with disasters can cause greater losses for the community. In the disaster management cycle, an early warning system for natural disasters is absolutely necessary in the preparedness stage, an early warning system for each type of data, method of approach and instrumentation. The purpose of creating this early warning system is so that people living in disaster areas can be safe in their activities because early warning of disasters can be known, so that people can also take precautions to save themselves when natural disasters occur..

#### *d. Resource Mobilization Capacity*

Most of the informants said that there had been mobilization of resources, but the implementation had not been written. This is reflected in the existing categories but not yet written. This can be seen from the following informant's statement:

*“... yes we have resource mobilization ....”* (#3, 42 years old).

In addition, informant #1 who is also the spokesperson for the boarding school also stated that there has been mobilization of resources This is illustrated by the following informant's statement:

*“... here we already have mobilization of resources”*(#1, 75 years old).

LIPI-UNESCO / ISDR research in 2006 in three regions, namely Aceh Besar, Bengkulu and Padang which discussed preparedness from understanding disasters, environmental and physical vulnerabilities, emergency response plans, disaster warnings to the ability to mobilize resources. according to the scope of the study, it was found that the level of school preparedness was lower than that of the community. Based on this research, it can be concluded that schools are public spaces with high vulnerability. Research has been conducted to determine the level of disaster preparedness in the community.

#### *e. Policies and Guidelines*

Most of the informants stated that there was already a policy on disaster emergency response but it had not been written and there was no guidebook on this matter. This is reflected in the category, namely there is already a policy but no guidebook. This can be seen from the following informant's statement:

*“There are some policies from the Head of the Foundation but there is still no book yet,....”* (#3, 42 years old)

The policy in question is about overcoming emergency response disasters, this policy is still instructed by the authority, namely the management at the foundation meeting every month.

In addition, informant #1 is also the spokesman for the Islamic boarding school who also stated that there is already a policy. This is illustrated by the following informant's statement:

*“... Disaster preparedness policies exist but are not written”*(I1, 75 years old).

The implementation of disaster preparedness does not only involve the government, but also involves the community, especially for health workers. As one of the important components in disaster response, nurses have a very big role. Failure in the roles and responsibilities of nurses results in failure in dealing with disaster victims. So in addition to expert nurses in their fields, nurses must also know how disaster preparedness is implemented so

that they can minimize disaster risks and increase the success of handling disaster victims. The activity of disaster preparedness is to form an integral part of the national system which is responsible for developing disaster management plans and programs which include: prevention, mitigation, preparedness, response, rehabilitation or reconstruction (Husna, 2012).

### 1. Preparation of an Emergency Preparedness and Response System Plan

Five respondents stated that the system requirements needed were to know and understand about APAR (fire extinguisher), PPE (Personal Protective Equipment) and disaster mitigation in the terraced building of the Al Qodiri Islamic boarding school, Jember. This can be seen from the following informant's statement :

“APAR is a light fire extinguisher”(I2,40 years old)

Respondents understand about APAR (fire extinguisher) and how to use it with the following statement:  
“*Insyallah, I kind of know how to use it....*” (I2,40 years old)

In addition, informant # 5 stated about the availability of PPE that is provided by the management in each building as stated in the following I5 statement:

” *The availability of PPE, such as masks, has been provided by the management as much as 1 box.* (I5, 20 years old)

This is in accordance with the research conducted by Hendro (2020), concerning the study of the relationship of supporting equipment for firefighters (case study: light fire extinguishers). The results of the study show the effectiveness of the use of fire extinguishers (APAR) in terms of design which are able to support officers which are very concerned about from an ergonomic side is it effective enough in its use. Because the weight of the fire extinguisher is not light enough, there will be many new problems faced by officers in carrying out the blackout process.

The results of interviews conducted with five respondents stated that the implementation of emergency response had been carried out but was not optimal and there was no SOP or guidebook related to the implementation of disaster emergency response carried out by the Al-Qodiri Islamic boarding school so it is necessary to prepare SOPs and a guidebook on disaster emergency response.

## CONCLUSSION

There are several potential hazards of multi-storey buildings at Al-Qodiri Islamic Boarding School, including the potential for physical hazards in the form of a humid room, lack of lighting, and lack of ventilation and feeling stuffy. There are several disaster emergency response preparedness systems at the Al-Qodiri Islamic Boarding School, including knowledge and attitudes in the form of understanding and understanding of the

disaster preparedness system. There are several system requirements at the Al-Qodiri Islamic Boarding School, including *fire extinguishers* that are already in multi-storey buildings, PPE in the form of masks that have been provided by the building management.

## REFERENCES

- Ahmadi, R. Memahami Metode Penelitian Kualitatif. Universitas Negeri Malang, 2015.
- Alif A. Analisis Bahaya Gempa Bumi Kabupaten Dan Kota Bekasi Berbasis Skenario. Prosiding seminar nasional fisika, 2019; 8.
- Andinawati, A. Perbedaan Rencana Tanggap Darurat Gempa Bumi Pada Sekolahdasar Daerahpesisir Dan Daerah perkotaan di Malang. Jurnal Ilmiah Kesehatan, 2020; 8(2).
- Arikunto. Prosedur Penelitian Suatu Pendekatan Praktek. Jakarta : PT. Rineka Cipta, 2006.
- Astra Green Company. Pedoman Pengelolaan Lingkungan, Keselamatan & Kesehatan Kerja, Jakarta, 2002.
- Badan Koordinasi Nasional Penanganan Bencana. Pengenalan Karakteristik Bencana dan Upaya Mitigasinya Di Indonesia. (2th ed). Jakarta: Direktorat Mitigasi, 2007.
- Badan Nasional Penanggulangan Bencana. Peraturan Kepala Badan Nasional Penanggulangan Bencana Nomor 4 Tahun 2008 Tentang Pedoman Penyusunan Rencana Penanggulangan Bencana. Jakarta: BNPB, 2008.
- Budimanto. Hubungan Pengetahuan, Sikap Bencana Dan Keterampilan Basic Life Support Dengan Kesiapsiagaan Bencana Gempa Bumi Pada Mahasiswa Keperawatan Poltekkes Banda Aceh. Jurnal Ilmu Kebencanaan, 2017; 4(2).
- Colling, David, A. Industrial Safety and Health Management. New Jersey : Prentice Hall, 1990.
- Creswell, J. W. Research Design: Pendekatan Kualitatif, Kuantitatif, dan Mixed. Yogyakarta: PT Pustaka Pelajar, 2010.
- Departemen Pendidikan Nasional. Undang-Undang Nomor 20 Tahun 2003, Tentang Sistem Pendidikan Nasional. Jakarta: Depdiknas, 2003.
- Erkins, Jh. 1998. Emergency Planning and Response, Majalah Hiperkes dan Keselamatan Kerja, 1998; XXXI(3): 26 – 31.
- Farida, N. Pengalaman Bio-Psiko-Sosial Pasien Diabetes Militus dengan Retinopati Diabetik di Wilayah Rumah Sakit Daerah Kalisat Kabupaten Jember. Fakultas Ilmu Kesehatan S1 Keperawatan Universitas Muhammadiyah Jember, 2016.
- Fitriawan R. Jurnalisme Sins dan Sistem Peringatan Dini Bencana Di Indonesia. Kajian Jurnalisme, 2017; I(1).
- Gabby, E. Manajemen Risiko Kesehatan Dan Keselamatan Kerja. Pascasarjana Teknik Sipil Universitas Sam Ratulangi, 2014.
- Husna, C. Faktor-Faktor yang Mempengaruhi Kesiapsiagaan Bencana di RSUDZA Banda Aceh. Idea Journal Nursing, 2014; 3(2).

17. Jaelani, Timur, HA, MA. Peningkatan Mutu Pendidikan Pembangunan. Perguruan Agama. Jakarta: P.T. Dermaga, 1982.
18. Lestari, A. Sistem Peringatan Bencana dan Mobilisasi Sumber Daya dalam Menghadapi Bencana Gempa Bumi. *Idea Journal Nursing*, 2017; 8(2).
19. Malhotra, Naresh and Birks, David. *Marketing Research: an applied approach: 3rd European Edition*. Harlow, UK: Pearson Education, 2017.
20. Moleong, L. J. *Metode Penelitian Kualitatif*. Edisi revisi. Bandung: Rosdakarya, 2012.
21. Mulyono. *Petunjuk Standarisasi Desain Gedung Bertingkat*. Bandung: Ganeca Exact, 2000.
22. Nasir M, *Metode Penelitian*. Jakarta : Ghalia Indonesia, 2003.
23. Notoatmodjo, S. *Metodologi Penelitian Kesehatan*. Jakarta : Rineka Cipta, 2005.
24. OHSAS 18001. *Occupational Health and Safety Management System Requirements*, 2007.
25. Pasal 1 Undang-Undang No. 24 Tahun. Jakarta: DPR RI dan Presiden RI, 2007.
26. Pondok Pesantren Al Qodiri. *Data Informasi Pondok Pesantren Al Qodiri Jember*, 2019.
27. Prastowo, A. *Metode penelitian kualitatif*. Yogyakarta: Ar-ruz Media, 2016.
28. Pusat Data, Informasi dan Humas. 2010. *Sistem Penanggulangan Bencana*. <http://bnpb.go.id/>. Diakses tanggal 11 Oktober, 2019.
29. Pusat Data, Informasi dan Humas. 2012. *Definisi dan Jenis Bencana*. <http://www.bnpb.go.id/>. diakses tanggal 12 Oktober, 2019.
30. Rahmayanti R. Analisis bahaya fisik: hubungan tingkat pencahayaan dan keluhan mata pekerja Pada area perkantoran health, safety, and environmental (hse) pt. Pertamina rui balongan .*Optimasi Sistem Industri*, 2015.
31. Ramli, Soehatman. *Pedoman Praktis Manajemen Bencana*. Jakarta : Dian Rakyat, 2010.
32. Sinurat, Hulman., & Adiyudha, Ausi. *Sistem Manajemen Penanggulangan Bencana Alam Dalam Rangka Mengurangi Dampak Kerusakan Jalan Dan Jembatan*. Jakarta: Puslitbang Jalan dan Jembatan, 2012.
33. Sudiharto. 2011. *Manajemen Disaster*. <http://bppsdmk.depkes.go.id/>. Diakses tanggal 12 Oktober, 2019.
34. Sumardjito. "Emergency Exit" Sebagai Sarana Penyelamatan Penghuni Pada Bangunan-Bangunan Skala Besar *Jurnal UNY*, 2010; VI(1): 24–32.
35. Susilo T. *Studi Produk Peralatan Penunjang Petugas Pemadam Kebakaran (Studi Kasus: Alat Pemadam Api Ringan)*. *Jurnal narada issn 2477-5134*, 2020; 7(2).
36. Syahidah N. *Aspek Keamanan dan Keselamatan Kerja Dalam Produksi Sediaan Farmasi*. *Farmaka*, 2018; 16(1).
37. Syukri, Sahab. *Teknik Manajemen Keselamatan dan Kesehatan Kerja*. Jakarta: Bima Sumber Daya Manusia, 1997.
38. Tumilar, Steffie. *Perilaku dan Sistem Struktur Pada Perencanaan Gedung Tinggi*, 2015.
39. Udiyana, Nyoman Dwi Maha. *Bencana datang Tanpa Rencana, Namun Penanggulangan Harus terencana*. <http://www.academia.edu/>. Diakses tanggal 11 Oktober, 2019.
40. Wahyudi, Eko. *Konsep Perencanaan dan Perancangan Pondok Pesantren Modern di Karanganyar dengan Pendekatan Arsitektur Islam*. Universitas Negeri Solo, 2018.
41. Zalka KA. *Structural Analysis of Regular Multi-Storey Buildings*. Boca Raton: CRC Pres, 2014.