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COVID-19 Awareness System Based on Risk Assessment (COVID-19 Handling Implementation in Universitas Pekalongan)

Sistem Kewaspadaan COVID-19 Berbasis Penilaian Risiko (Implementasi Penanganan COVID-19 di Universitas Pekalongan)

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ABSTRACT

World Health Organization (WHO) announced COVID-19 as a global pandemic since it occurred massively in the whole part of the world. COVID-19 has an impact on life's aspects, including the academic life aspect. This study aims to assess the risk factors of COVID-19 to build an awareness system of COVID-19 in higher education. This research is qualitative research with a case study approach regarding the risks of COVID-19 at Universitas Pekalongan. Variables were including risk identification, risk analysis, and risk evaluation. Information about the data source, including a university leader, and its vice, acts as a primary informant, the leader of units, and faculty acts as a triangulation informant. Structured-interview was applied to analyze risk identification, and risk analysis, compared criteria and risk impact analyzed the risk of evaluation. This study was conducted from June to August 2020 and held in Universitas Pekalongan. From risk identification and risk analyze there are six results: transmission of COVID-19 with a score of 25, *Tri Dharma Perguruan Tinggi's* activities are not being optimally organized (score of 6), learning competence has not achieved a score of 9, decreased income (score 12), difficulty adapting in mastering internet-based technology (score of 4) and decreased number of new students (score of 12). Refers to risk evaluation risk known that transmission of COVID-19 is the highest-level risk. Risk assessment of COVID-19 impact is developing in the awareness system for comprehensive protection and it's reference for re-engineering the change strategy in higher education affected by COVID-19.

ABSTRAK

Organisasi Kesehatan Dunia menyatakan COVID-19 sebagai pandemi global sejak menjangkit secara masif di seluruh belahan dunia. COVID-19 berdampak terhadap seluruh aspek kehidupan termasuk akademik. Penelitian ini bertujuan menilai faktor risiko COVID-19 untuk membangun sistem kewaspadaan COVID-19 di perguruan tinggi. Penelitian ini adalah penelitian deskriptif kualitatif dengan pendekatan studi kasus. Variabel penelitian meliputi identifikasi risiko, analisis risiko dan evaluasi risiko. Informan penelitian yaitu pimpinan universitas dan wakilnya sebagai informan utama, pimpinan unit dan fakultas sebagai informan triangulasi. Identifikasi risiko dan analisis risiko dilakukan melalui wawancara terstruktur, evaluasi risiko dilakukan dengan membandingkan antara kriteria risiko dengan dampak risiko. Penelitian ini dilakukan pada bulan Juni hingga Agustus 2020 di Universitas Pekalongan. Berdasarkan identifikasi risiko dan analisis risiko didapatkan enam hasil yaitu penularan COVID-19 (skor 25), kegiatan *Tri Dharma Perguruan Tinggi* belum terorganisir secara optimal (skor 6), kompetensi belajar belum mencapai (skor 9), menurunnya pendapatan (skor 12), kesulitan beradaptasi dalam penguasaan teknologi internet (skor 4) dan penurunan jumlah mahasiswa baru (skor 12). Mengacu pada evaluasi risiko diketahui bahwa penularan COVID-19 merupakan risiko pada level tertinggi. Hasil penilaian risiko COVID-19 ini untuk mengembangkan sistem kewaspadaan sebagai perlindungan komprehensif dan menjadi acuan untuk rekayasa ulang strategi perubahan di perguruan tinggi akibat COVID-19.

INTRODUCTION

For the first time, on December, 31st, 2019, China announced a case of pneumonia etiology was still uncertain. Subsequently, on January, 7th, 2020, it was confirmed that pneumonia cases were caused by a new type of corona-virus called *coronavirus disease* (COVID-19). Clinically, the main signs and symptoms of COVID-19 infection are fever, cough, shortness of breath, sore throat, fatigue, and weakness. On average, the incubation period for Covid-19 is varied, from five to six days, with the most extended incubation period of fourteen days. The coronavirus spreads rapidly between countries causing world unrest, and World Health Organization (WHO) was designated the Public Health Emergency of International Concern on January, 30th, 2020.¹

A study shows the incidences of confirmed COVID-19 outside of China is known to have no travel history from China and may have spread outside China.² Within days, this virus has spread rapidly from Wuhan City to all of Hubei Province and other provinces in China. One of the causes of the rapid spread of corona virus is the density of transportation during the Chinese New Year period on January, 25th, 2020. COVID-19 cases outside China first occurred in Thailand on January, 13th, 2020, then spread quickly and globally.³ The COVID-19 pandemic is a multidimensional problem, namely aspects of the source of transmission, its spread, its impact on various health, social, economic, cultural, religious, and affecting human civilization. The Covid-19 pandemic requires collaboration between governments around the world, WHO, United Nations, health institutions, and international organizations.⁴

Until June 2020 the number of COVID-19 cases in Indonesia reached 32,033 cases, COVID-19 in the world had reached 7 million cases, and the number of deaths reached 1,883 people in Indonesia⁵ The Indonesian government first reported two confirmed cases of Covid-19 on March, 2nd, 2020. Since then, the number of new cases is rising rapidly.¹ Data for COVID-19 in Pekalongan City until June, 14th, 2020, about 17 people were confirmed positive for COVID-19, of which 13 people recovered, 1 person went into self quarantine and three people died.⁶ Data for COVID-19 in Central Java on June, 26th, 2020, the number of positive cases of COVID-19 was 3.559

people and the number of patients under surveillance was 8,444 people.⁷

The COVID-19 pandemic is no longer a health problem because its impact extends to the economic, education, socio-cultural, security, political, and community welfare sectors. Facing this situation requires comprehensive efforts from all aspects and elements of society to cut the transmission of COVID-19 transmission.⁸ The COVID-19 pandemic has a very significant impact on the sustainability of higher education. Higher education is an institution with a large community and a wide area distribution that causes a considerable risk of COVID-19 transmission.⁹ On the other hand, tertiary education institutions have a strategic role in disaster prevention and risk reduction efforts.¹⁰ From a disaster perspective, an early alert system is a primary strategy for controlling the impact of risk-based disasters that arise.¹¹ This study aims to assess the risk factors of COVID-19 to build an awareness system of COVID-19 in higher education.

MATERIAL AND METHOD

This research was qualitative research with a case study approach regarding the risks of COVID-19 at Universitas Pekalongan. The case study design was selected to obtain a specific picture of the risks posed by COVID-19 for Universitas Pekalongan and to assess risks based on risk assessment techniques. The research was carried out at Universitas Pekalongan in June-August 2020; in that period, the daily COVID-19 cases had exceeded the thousands of cases. During that period, the office cluster cases experienced a significant increase. Research variables consist of risk identification variables, risk analysis variables, and risk evaluation variables. The research was carried out in three stages. The first stage was to identify risks due to the impact of COVID-19; the second stage was to analyze the risk on the causal and effect factors, and the third stage was risk evaluation; the three stages in the risk assessment were carried out prospectively. At the risk identification stage and risk analysis, The data collection was done qualitatively with structured interviews accompanied by environmental observations to obtain an overview of COVID-19 prevention measures at Universitas Pekalongan.¹¹

The research subjects were determined purposively, considering that the subjects had data and information regarding the risk of COVID-19 in their respective units. In this study, research subjects or informants were grouped into two: the main informant, the Chancellor, and Vice-Chancellors 1, 2, and 3; the second informant was the triangulation informant, consisting of the Chairperson of LPMU, Chair of the LPPM, Dean of the Faculty of Health Sciences, Dean of the Teaching Faculty and Science Education, Dean of the Faculty of Agriculture and Dean of the Faculty of Law. In data collection, the researcher acted as the primary research instrument through structured, in-depth interviews. Researchers used triangulation techniques to ensure the credibility and validity of the research data. Two types were used, namely data triangulation and method triangulation. Data triangulation was carried out by in-depth interviews with triangulation informants. Method triangulation was carried out by observing the behavior of implementing health protocols and observing the situation of the campus environment.¹²

This research had been approved by the Health Research Ethics Committee of the University of Pekalongan, Indonesia, and was registered with an Ethical Clearance number 92/B.02.01/KEPK/VII/2020.

RESULTS

This study was limited only to the context of risk assessment, which consists of identifying, analyzing, and risk evaluation. Identification of the risk of COVID-19 at Pekalongan University was carried out by in-depth interviews with informants. These were shown below:

"Unikal juga dihadapkan pada risiko penularan di lingkungan kampus. Risiko yang akan terjadi yaitu tidak tercapainya aktivitas Tri Dharma Perguruan Tinggi secara maksimal yang diselenggarakan secara daring." (I1)

"Ya pasti quality, pasti pencapaian kompetensi itu tidak bisa 100% dari seharusnya." (I2)

"Karena kami khawatir persoalan pandemik ini berdampak pada persoalan keuangan dan daya beli yang akan berakibat pada pemasukan." (I3)

"Katakan kalau kita persentasikan di awal minggu pertama barangkali dosen yang melakukan betul-betul dengan IT yang bagus ya atau melalui daring

minimal dengan SIAKAD 30% bayangkan dari 156 dosen kita hitung di minggu pertama seperti itu." (I2)

"Nah Unikal harus bisa bertahan maka kata kuncinya ada pada penerimaan mahasiswa baru. Mahasiswa baru ini harus bisa sama dengan tahun sebelumnya atau kalau bisa naik." (I1)

The results of the risk identified are presented in Table 1. The risks were identified, namely risk of transmission, Tri Dharma Perguruan Tinggi activities, learning competence, finance, mastery of internet-based technology, and the number of new students. Table 1 also presented the sources of risk and the owner of the risk.

Risk analysis was the second step in risk assessment. The results known that the transmission of COVID-19 had the highest probability and the highest impact.

"Dan itu adalah bukti bahwa kami memperhatikan mahasiswa kami dan peduli terhadap covid." (I3)

"Kalau kita menomorsatukan kompetensi ya tentunya akan berdampak pada ketidaksielamatan." (I2)

"Memang situasinya semakin meruncing ya, Nasional bertambah, Jawa Tengah bertambah, Pekalongan juga bertambah" (I7)

The complete risk analysis results were presented in Table 2. The transmission of covid-19 was a high risk with an extraordinary impact, followed by decreased income and decreased number of new students.

The third step of risk assessment was risk evaluation. The results showed that the risk of COVID-19 transmission was with a very high status.

"Pandemic ini Covid-19 bersifat global dan Indonesia terkena dampak dari Covid-19 dimana dari berbagai informasi yang kita peroleh virus ini tingkat penularannya sangat cepat dan sangat masif. Dan dengan kondisi itu maka dunia pendidikan termasuk juga terkena dampak." (I1)

"Virus inikan kekuatan penyebarannya yang luar biasa" (I6)

"Karena mahasiswa kita banyak yang berasal dari berbagai daerah zona merah masuk ke kampus, Pak Rektor mengkhawatirkan ada klaster baru di Unikal" (I8)

"Kalau risiko itu pasti selalu bisa terjadi, dibuktikan tadi disampaikan bahwa saat ini sudah ada 66 ribu paparan Covid, sehingga dari hari ke hari selalu tambah. Hal ini tentu menjadi kajian kita semua bagaimana

kita untuk tetap mewaspadaai terjadinya paparan Covid” (110)

Table 3 showed a “very high” status indicated that the transmission of COVID-19 in a campus environment was a top priority to be controlled. The results of observations in the Pekalongan University environment were known as follows: there were no theoretical learning activities in the classroom and skill practice in all laboratories. The services of academics and students

were closed and shifted online. The new student registration service was opened with restrictions according to health protocols. Although face-to-face learning was transferred online, at some spots of the campus were still seeing crowds of students. They came to collect assignments and take modules. This situation occurred because not all lecturers mastered the internet-based online learning system.

Table 1. Risk Identification of COVID-19 at Universitas Pekalongan

Identified Risks	Sources of Risk	Risk Owner
Transmission of COVID-19	Coronavirus infection transmission	Lecturers, employees, students, guests
Tri Dharma PT's activities were not optimally organized	Tri Dharma PT's activities were held online	Lecturers and students
Learning competence was not achieved	Learning activities (theory and practice) were held online	Students
Decreased income	Decreased ability of students to complete payment obligations	Universitas Pekalongan
Difficulty adapting in mastering internet-based technology	Learning activities (theory and practice) were held online	Lecturers and students
Decreased number of new students	The decreased economic capacity of students/parent	Universitas Pekalongan

Source: Primary Data, 2020

Table 2. Risk Analysis of COVID-19 at Pekalongan University

Identified Risks	Probability		Impact		Level
	Rate	Category	Rate	Category	
Transmission of COVID-19	5	High-possibility	5	Extraordinary	25
Tri Dharma PT's activities were not optimally organized	3	Mid-possibility	2	Small	6
Learning competence was not achieved	3	Mid-possibility	3	Medium	9
Decreased income	3	Mid-possibility	4	High	12
Difficulty adapting in mastering internet-based technology	2	Small-possibility	2	Small	4
Decreased number of new students	3	Mid-possibility	4	High	12

Source: Primary Data, 2020

Table 3. Risk Evaluation of COVID-19 at Universitas Pekalongan

Identified Risks	Level	Status
Transmission of COVID-19	25	Very High
Tri Dharma PT's activities were not optimally organized	6	Small
Learning competence was not achieved	9	Medium
Decreased income	12	High
Difficulty adapting in mastering internet-based technology	4	Small
Decreased number of new students	12	High

Source: Primary Data, 2020

DISCUSSION

Continuous efforts that involve all parties' participation are the key to implementing disaster risk reduction in Indonesia with the support of a strong commitment and orientation towards priority actions. One of the five national priorities points to identifying, assessing, monitoring risks and early warning efforts. Community participation in disaster management has been regulated in Law Number 24 of 2007 concerning Disaster Management. Community participation can be done independently or cooperatively from pre-disaster, emergency response, and post-disaster periods by prioritizing risk reduction efforts.

Disaster risk reduction is focused on the pre-disaster period with an emphasis on seven aspects, namely coordination of prevention and preparedness; building an integrated risk reduction system; and allocation of appropriate resources based on a risk analysis. Another aspects are strengthening the integration of early warning systems; strengthening mitigation infrastructure; education and training to increase capacity; expand accurate disaster literacy; and fulfillment of logistics and equipment.¹³ Through an early alert system, the potential of health problems that require public health intervention can be identified earlier.

The implementation of the early alert system is able to increase the capacity of national health system and regional health system based on actual data.¹⁴ Early Warning System was built to provide protection for the community to be able to make efforts reducing risk and impact. These efforts are supported by a data collection and analysis technology infrastructure as part of the decision-making process and a decision analysis model. The implementation of the Early Warning System is adapted to the scope of the disaster and social models.¹⁵ The control of new emerging infectious diseases is carried out across sectors through One Health Policy that integrates cross-sectoral communication strategies at every government level.¹⁶

The risk of mortality and morbidity is higher in disaster areas that do not have a sustainable early warning system. The early warning is a public health protection for communities in hazardous areas. According to the report of UNDR (United Nation for Disaster Reduction) 2006, the

early warning system is broken down into four aspects: risk knowledge, monitoring and warning, dissemination and communication, and response capability.¹⁷

The early warning system is very important in controlling and preventing outbreaks of infectious diseases by detecting the size of the distribution of infectious diseases to determine the risk of an outbreak. The Warning System includes collecting and analyzing of data and information on the spread of infectious diseases to determine an early warning model as a basis for taking preventive and risk reduction policy.¹⁸ In addition to detecting potential health problems, early warning alert response systems strengthen the health system overall.¹⁴

The COVID-19 pandemic impacts various life sectors both medically, socially, politically, economically, religion, culture, and civilization. Its impact is very significant for all human life being around the world and requires study from various fields of science.⁴ The government's effort to reduce the spread of COVID-19 is implementing the policy of social restriction to restrain people's movement, as implemented in many other countries. According to Sayekti, social restrictions can significantly reduce the spread of COVID-19 by up to 60-70%.¹⁹ Referring to Suprayoga Hadi's writing published in *The Indonesian Journal of Development Planning*, it is stated that the academic element in the institutional framework is part of community participation.²⁰

Community participation in risk reduction includes risk recognition, disaster management efforts implemented into a disaster awareness culture, developing an information system for early warning disasters, and disaster mitigation.²⁰ Risk is the result of quantification of hazard and vulnerability and is inversely proportional to risk reduction capacity. Capability shows how much the facilities are provided, both physical and non-physical to minimize risk.²¹ According to the CDC, the main component of public health preparedness is community involvement and partnerships that can be developed at the local and national levels.²²

Coordination and cooperation between the government, international organizations, and civil society are needed in handling COVID-19. Community support and involvement are neces-

sary because the community is the one most affected. It is expected that civil society's participation and the intelligence community can support the government in placing public health insurance as a priority for handling COVID-19 policies.²³ Analysis of response to COVID-19 is carried out to build a future response system of COVID-19 to measure capacity in building a response strategy.²⁴

The campus area is an environment that has a high potential for transmission because there are activities that are carried out together at the same time, and by involving many students from various regions. This condition poses a significant risk of transmitting COVID-19 if it is not adequately controlled. Activities on campus are at significant risk if not controlled due to interactions, crowds of students, and other activities. Another thing that needs to be studied is the risk of transmission that may occur when students are on their way to campus or return from campus. To prevent the spread of COVID-19 in the campus area, all learning activities in higher education are carried out online as a substitute for face-to-face activities.⁵ The COVID-19 alert campus launched by the Indonesian Health Ministry is expected to provide protection for the campus community from the risk of corona virus transmission.⁹

The risk assessment has been regulated in Government Regulation Number 6 of 2008 concerning Government Internal Control Systems. Risk analysis to obtain an idea of how significant a risk is, its likelihood of occurring, and the extent of its impact. In the Government Regulation, it is stated that the risk comes from internal factors and external factors. In contrast, a risk analysis is made to identify the impact of risk on achieving organizational goals. Risk identification can be made using quantitative-qualitative methods. The risk is analyzed based on its relevance to the activity/program/risk organization's objectives and the level of risk concerned.²⁵

Risk assessment is a series of activities that begin with specific and consistent goal setting at the activity and organizational levels. After the objectives are set, the further step is to identify risks that can hinder the achievement of previously established objectives. The results of risk

assessments is a base in decision making to manage risks in support of safety.²⁶

Risk assessment results are used as the basis for formulating risk management and risk control measures to reduce the potential and impact of risks. Risk assessment targets are risks from internal and external sources and other sources that can cause risk.²⁵ Educational institution is obliged to provide safety and health protection for academicians involved in the educational process. Through a risk assessment, it can be identified specifically all the risks that occur due to activities and learning facilities. The results of the risk assessment become a reference in determining preventive action. Several recent studies stated that risk assessment needs to be formulated into a policy in educational institutions based on hazard identification.²⁷

The Indonesian government has designated the COVID-19 pandemic as a non-natural national disaster, and thus in its handling, it applies a disaster approach.²⁸ In response to the COVID-19 outbreak, the priority action taken is to carry out an early warning to reduce the risks and impacts caused by COVID-19. Risk reduction measures by examining and assessing risk through three stages: risk identification, risk analysis, and risk evaluation. The results of risk assessment are the basis for building a risk-based COVID-19 alert system.

Some of the government's efforts to increase awareness of COVID-19 include identifying, isolating, and providing optimal health services for exposed patients. The government also builds risk communication and adequate information for all people to work together to fight COVID-19.²⁹ Risk is defined as an unwanted event that has the potential to occur and has a negative impact.³⁰

Based on Government Regulation Number 60 of 2008, Universitas Pekalongan faces risks caused by the pandemic. The external risks come from these factors: transmission of COVID-19 within the campus environment, decreased income due to unpaid tuition fees, decreasing students in the new term. The third factor exists due to the decline in the community's economic capacity affected by the pandemic, which caused people to delay continuing their studies in college. The internal risk comes from these two factors. First, non-optimal implementation of *Tri*

Dharma Perguruan Tinggi due to the discontinuation of activities that risk of spread of COVID-19. Second, fail to achieve the learning competence and graduate profile due to changes in the implementation learning, from offline to online. Third, difficulties experienced by lecturers in adapting to internet-based technology in online learning.

Risk identification is an activity to discover, identify, and describe risks. The objects of risk identification include risk sources, events, causes, potentials, and consequences. Furthermore, the discovery, identification, and description of risk are obtained from historical data, theoretical analysis, information and expert opinion, and stakeholders' needs. Then, the identification of risks produces called a risk profile. Table 1 lists the risks that affect the achievement of a goal or target at Pekalongan University. Risk identification is carried out to obtain a comprehensive list of risks; a risk that is not identified does not enter the next stage, namely risk analysis.³¹

The second stage of the risk assessment process is risk analysis. This stage aims to understand the nature and level of risk, and the results form the basis for the next stage, namely, risk evaluation. Risk analysis examines the identified risks by considering the causes, sources of risk, the likelihood of occurring, and the resulting impacts, both positive and negative. Risk analysis also considers the multiple impacts of a risk that causes some goals and objectives not to be achieved. Another factor considered in risk analysis is the accuracy of strategies and methods of risk control measures so that control can run effectively and efficiently.³²

The risk analysis result is a risk map presented in Table 2, which contains the types of risks, the probability of events, and the impact of risk. Risk analysis is carried out using quantitative, qualitative methods or combining the two methods tailored to the situation and needs. The risk analysis results in Table 2 show the risk of COVID-19 transmission at level 25, which is the highest score compared to other risks³¹. The campus area is a potential environment for transmission because there are activities carried out together at the same time by involving many people, namely students from various regions.

This condition poses a significant risk of transmitting COVID-19 if it is not adequately controlled.

The pandemic brought significant changes to the implementation of internet-based distance learning to break the transmission chain from person-to-person contact. Online learning is currently beneficial for students to replace face-to-face learning.³² However, not all scientific fields are useful in implementing distance learning because the competencies achieved are skill-based. This rapid change in the learning model is not followed by an adequate learning management system readiness and cannot achieve optimal learning competencies. The COVID-19 pandemic has disrupted the business sector's economic activities and the community's economic activities; this situation has caused people's income to fall and impacted decreasing purchasing power.

Online-based distance learning becomes a problem for students if they have inadequate facilities and infrastructure. Students will have difficulty adapting to new situations because they are used to conventional face-to-face learning. The threat of transmission of COVID-19 is a double burden for students, which causes psychological effects in anxiety disorders. If this situation continues, it can cause difficult learning competence to be achieved.⁵

Risk evaluation is the third stage of risk assessment; the results determine risk treatment and treatment implementation priorities. Risk evaluation is carried out to determine the risk level's comparison with criteria based on a pre-determined context. Risk evaluation refers to data, information, and knowledge-based to formulate decisions about a risk and uncertainty caused by the event under investigated. The decision making process is carried out carefully by considering scientific aspects with scientific evidence.³⁰

The risk evaluation results are presented in Table 3, showing the "very high" risk status for COVID-19 transmission. The transmission of COVID-19 is challenging to prevent and control because it is spread from person to person, especially those who have high mobility. Measures are taken to control COVID-19 in people who have a history of close contact with infected sufferers. The findings continued with a rapid test

and isolation of people caught in contact tracing.³³ Efforts to reduce the campus environment's risk of transmission were carried out by forming the COVID-19 Task Force Team at Universitas Pekalongan. The purpose of establishing the Cluster Team is to facilitate prevention and control activities in the campus environment, including compiling health protocols in the field of *Tri Dharma Perguruan Tinggi*.

Higher education can develop a prevention system in the campus environment and the community by utilizing its resources. Higher education has a strategic role in managing COVID-19 because it has high literacy and the right economic level. Human resources owned by higher education can be empowered to control COVID-19 through *Tri Dharma Perguruan Tinggi* activities.

CONCLUSION AND RECOMMENDATION

The alert system is a priority effort in the prevention and control of COVID-19 at Pekalongan University. The orientation of COVID-19 prevention is risk reduction through risk assessment. This risk assessment results serve as the basis for building an early warning system against risks and impacts that could occur in the campus environment.

The status of the risk of transmission of COVID-19 in the Pekalongan University environment is "very high" because transmission characteristics are easy and fast, especially in environments with large community members from different areas. Controlling COVID-19 is a priority for risk treatment because of the risk of transmission impacts other risks.

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