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To cite this article: Endang Fourianalistyawati *et al* 2018 *J. Phys.: Conf. Ser.* **1114** 012069

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Research Development in Indonesia: Ethics Committee in Open Science and Collaboration Era

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Abstract. This study aimed to find out the understanding of lecturers or researchers in Indonesia about the research ethics and distribution of research ethics committees in Indonesia. The study used survey method based on the online questionnaire. The sample of the study were 160 lecturer and researcher in Indonesia. Data collection was conducted in March 2018 then analyzed descriptively, and classification of information based on related themes such as research ethics and research ethics committee. The majority of lecturers or researchers at various universities in Indonesia have understood and considered about the importance of research ethics committees, even though there were still misconceptions about duties and functions of it. The number of research ethics committees in Indonesia was still small, and the majority only exists in the western part of Indonesia. Furthermore, the disruptive innovation and industrial revolution 4.0 era expose a new tendency for the research world, namely open science and collaboration, which requires the ethical research guidance and as well as the necessity of its governance by 21st-century developments.

1. Introduction

The research and invention of science and technology are two things that can respond and solve the problems and improve the prosperity and the competitiveness of society. It reveals that the researching passion of senior and young researchers in Indonesia along with the number of published articles is also higher. The awareness to produce quality research not only regarding content but also can be accounted morally, increasingly becomes a concern in developing a healthy researching culture in Indonesia. Researchers need to understand the ethics in doing research, especially in maintaining data and identity and safety of the research subjects taken. Researchers need to reward the research respondents as well as the information provided with full honesty and honor [1]. Furthermore, the



research ethics committee helped the researcher to provide the structure of discussion and decision making, keep the signs in protecting the research subject, and give the applicative understanding about the benefits and risks by the guideline of consideration to the benefits and risks of the research conducted. The importance of responsible behavior in the study is also a significant concern of the professional organizations of researchers [2]. The emphasis on ethical research has existed since Hippocrates put forward the principle of “no harm” and continued to evolve until after World War II with the birth of the Nuremberg Code and the Helsinki Declaration to organize research involving human participation. Also, research involving animals is also arranged in a written regulation since the 1960s, taking into account animal welfare and rights [3].

The concern of Indonesian government related to the research ethics and responsible conduct of research has been focused on the health sector. As an example is the Regulation of the Minister of Health (PMK) Number 7 of 2016 on the National Commission for Research and Development of National Health. This committee assists the Health Minister of the Indonesian Republic in regulation, guidance, and enforcement of ethical research and health development, for researchers who were conducting research using human and animal studies as their research subjects. This commission consists of 29 people, according to Article 6 of PMK No. 7 of 2016. The membership of the commission includes of elements derived from a. health researchers; there is 5 (five) person; b. Health workers, there are 5 (five) person; c. The veterinarian there are 3 (three) persons; d. Traditional or complementary health experts, there is 2 (two) person; e. jurists, there is 2 (two) person; f. bioethics experts, there are 2 (two) person; g. Experts of social culture, there is 2 (two) person; h. Representatives of ethics research committees and health development institutions, there are 5 (five); i. Representatives of the Health Research and Development Agency of the Ministry of Health, there is 1 (one) person; j. The representative of the Directorate General of Research and Technology Development, Ministry of Research, Technology and Higher Education, there is 1 (one) person; k. The Food and Drug Supervisory Agency, there is 1 (one) person [4]. Based on this explanation, a researcher needs to pay attention and refer to the regulation if doing research using animal and human being as a research subject.

Moreover, the interesting part from the membership of the research ethics committee is the representation of a single person from the Directorate General of Strengthening Research and Development, Ministry of Research, Technology and Higher Education (Kemristekdikti) who is placed as a member in that commission. This indicates that Kemristekdikti has a concern about the importance in research based on human and animal as the research subject to go through the review process of the ethical committee previously before the process of research is continued. Also, several campuses in Indonesia have even started to have great institutions of ethics committees, which have the same objective, to protect the rights and confidentiality of the research subjects; therefore, on some campuses, this ethics committee indeed is still under the faculty of medicine. The researchers found that there are private campuses in Jakarta that have an ethics committee under the auspices of the university, serves to become the first carriers for all research proposals conducted by students and lecturers before finally eligible declared to go to the next process, namely taking the research data.

On the other hand, the industrial revolution of 4.0 with its digital characteristic followed by the rapid exchange of information through various information technology based on social media has changed the culture of society [5] [6]. The development of information technology also promotes an innovation, namely the open science which supports the birth of research culture collaboration in a massive way and interdisciplinary science in the 21st century. The existence of its disruption will eventually lead to severe morality (ethical) issues related to data ownership, sensitive data protection, authorship rights, protection of research subjects, and publications. The search results from the Google Scholar site pertaining to the research ethics, integrity of research, and ethics committees; the data showed that there were few researchers or writers who examine the lecturers' understanding of research ethics and duties and functions of the research ethics committee in Indonesia, meanwhile the presence of this ethics committee itself is realized as the essential thing by universities in abroad. Some Indonesian students and researchers working with overseas researchers, such as in Australia,

Netherlands, UK, and United States, first they must obtain a letter of ethics before conducting research together. However, the awareness of its importance to pass the analytical process of this ethics committee does not seem to be owned by many researchers, either individuals or groups. Therefore, the research of understanding of lecturers in Indonesia related on research ethics, and the distribution of research ethics committees becomes the vital concern to do, especially in the open science and collaboration era today.

Regarding the previous explanation above, the aim of this study is to get the description of understanding from the lecturers or researchers in Indonesia about the research ethics and the distribution of the research ethics committee in Indonesia. Based on the study results that will be made later, it is hoped that the comprehensive description can be obtained from the understanding of Indonesian researchers about the importance of ethics in conducting research thus creating the more conducive research environment for all, not only researchers but also for the subject of their research. This research is also expected to provide information on the distribution of research ethics committees, as well as an input for research institutes and universities that did not have research institutes and ethics committees yet on existing standards of human and animal-based research nationally and internationally.

2. Method

This study used survey method questionnaire-based, quantitatively and descriptively [7]. The sample of the study was lecturer and researcher in Indonesia (N = 160). There are not any profits or dangers arise from the response of research subject on this study [7]. The data was obtained through the dissemination of questionnaires about the research ethics, and the research ethics committees should be filled out entirely online related to the understanding of the ethics committee on lecturers and researchers in Indonesia, on March 2018. The data analysis used descriptive analysis (frequency and percentage) based on information obtained from the participants as well as the classification of information through their content response (themes) which related to the research ethics and research ethics committees.

3. Results And Discussion

3.1. Demographic data of Participants

The following demographic data from participants in this study:

Table 1. Demographic data of research participants

		Percentage
Academic Grade/Rank	Tutor	23.8%
	Instructor	37.5%
	Assistant Professor	26.9%
	Associate Professor	11.3%
	Professor	0.6%
Original Area of Institution	Western Part of Indonesia	61.3%
	Central Part of Indonesia	20%
	Eastern Part of Indonesia	18.8%
Study Program	Religion	1.3%
	Linguistic	2.5%
	Economics	18.1%
	Animal Husbandry	3.1%
	Health	13.1%
	Education	29.4%
	Arts, Design and Media	0.6%
	Social Sciences, Politic and Humanities	11.9%
	Agriculture	4.4%
	Engineering	11.9%
	Mathematics and Natural Sciences	3.8%

From the data of Table 1, revealed that most of the participants on this study had the position as the instructor (37.5%), originated from western part of Indonesia (61.3%), and came from the education study program (29.4%).

3.2. The understanding of ethics committee

The following data showed the percentage of respondents' understanding of the ethics committee:

Table 2. The understanding of ethics committee

Academic Grade/Rank	Understanding on Ethics Committee	
	Yes	Not
Tutor	20.6%	3.1%
Instructor	33.1%	4.4%
Assistant Professor	21.9%	5%
Associate Professor	10%	1.3%
Professor	100%	0%

Based on the data in Table 2, pointed out that most of the respondents from various academic grade/rank already know about the ethics committee. Most of them also considered that ethical feasibility testing was essential in conducting the research.

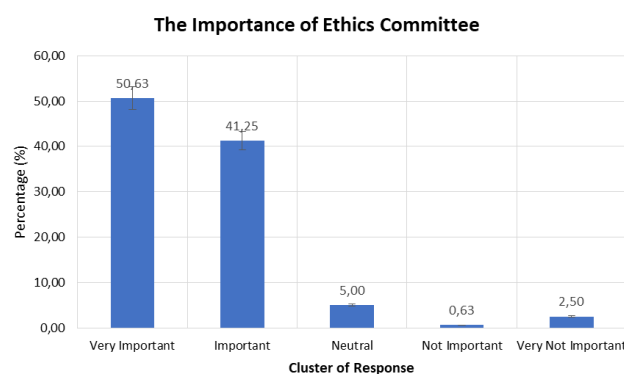


Figure 1. Percentage of the importance of ethics committee. Error bars amount 5%

This study also conducted a different test of analysis in the understanding and how important of the ethics committee about both groups; academic grade/rank and study program. The obtained result is showing that there were the differences understanding related to the ethics committee on divided groups at the study programs. Furthermore, there were also differences views about the importance of ethical committees in research on split groups at the academic grade/rank.

3.3. The availability of ethics committee

The following percentages from the availability of ethics committees at university;

Table 3. The availability of ethics committee at universities

		Percentage
Availability of Ethics Committee at Universities	Exist	52.5%
	None	47.5%
Official Part who handle Ethics Committee	None	45.6%
	Universities	43.1%
	Institution	2.5%
	Faculty/Study Program	8.8%

The data of Table 3 explained that most universities where respondents worked already have an ethical committee (52.5%). However, the percentage of universities which did not have an ethics committee yet was still quite large as 47.5%.

3.4. The distribution of ethics committee

The following percentages from the distribution of ethics committees in universities based on the division of Indonesia territory:

Table 4. The distribution of ethics committee in Indonesia

Indonesia Territories	Percentage per Territories	Percentage per all Respondents
Western	51.02%	31.25%
Middle	56.25%	11.25%
Eastern	53.33%	10.00%

Based on the data shown in Table 4, the distribution of ethics committees for each territory of Indonesia has reached more than 50%. It can be seen regarding whole respondents thus the ethics committees' existence tends to have a declining percentage because only universities at the western part which has ethics committees then followed by other universities in central and eastern part of Indonesia.

Besides the territory aspect, the distribution of ethics committees in each university can also be seen from the field of scientific disciplines or Majors/Origin Department of respondents, as is shown in Table 5.

Table 5. The distribution of university ethics committee based on the field of scientific disciplines

Field of scientific disciplines	Percentage per all Respondents
Social and Humanities	30.63%
Education	4.38%
Health	2.50%
Mathematics, Sciences, Engineering, and Arts	15.00%

Based on the data shown in Table 5, it is found that the most significant percentage of ethics committees exist in respondents' origin department with their background of the field of scientific disciplines on the social sciences and humanities, and followed by the health science disciplines field which exists in the lowest percentage had the ethics committee. Meanwhile, the respondents' origin department with scientific disciplines of educations' background has not entirely had ethics committee (4.38%).

If analyzed further on respondents' understanding about the research ethics committee, the data in Tables 4 and 5 can be reduced in line with the definition and scope of the ethical research committee according to Dove and Garattini [8] and Trace and Kolstoe [9]. Universities that have research ethics committees related to the division of Indonesian territory can be seen in Table 6.

Table 6. The distribution of ethical research committee in Indonesia

Indonesia Territories	Percentage per all Respondents
Western	20.00%
Middle	8.13%
Eastern	5.63%

Based on the data in Table 6, universities with the research ethics committees for the three territories in Indonesia were less than 50%, and the distribution of research ethics committees was still

dominated by universities that located in the western part of Indonesia, while for the majority of universities at the Middle and Eastern part of Indonesia did not have research ethics committees yet. Based on the field of scientific disciplines from respondents, the distribution of the research ethics committee can be summarized in Table 7.

Table 7. The distribution of research ethics committee of university based on field of scientific disciplines of respondents

Field of scientific disciplines	Percentage per all Respondents
Social and Humanities	19.38%
Education	3.13%
Health	2.50%
Mathematics, Sciences, Engineering, and Arts	8.75%

The existence of research ethics committees based on the field of scientific disciplines from respondents, dominated by social sciences and humanities. Meanwhile in education and health field was still much smaller when compared with the social sciences and humanities.

Based on the results obtained through this study, most of the lecturers or researchers who become the research participants have understood about the importance of the research ethics committee. On the other hand, the percentage result from the availability of ethics committees at universities revealed that there was still a large percentage of universities in Indonesia that did not have an ethics committee yet. The ethics committee is a significant concern because the ethics committee has the significant role in creating the research and scientific writing process in various fields of science. The ethics committee is an official requirement issued by a particular institution as a code of professional ethics by considering internal norms in the scientific and rational external societies to be responsible for the research activities or publications to the broader community [10]. The ethics committee can assess the risks and benefits of research, approval of procedures or research methods, local population-taking strategies, legal and regulatory aspects, the rights for the parties involved within the research process, and the granting of research licenses [8, 9].

Furthermore, the data in Table 4 revealed that the inequality assumption of the differential of research quality is also proven; the majority of the ethics committee is located in the western part then followed by middle section, and most recently at the eastern part of Indonesia. The unequal of ethical committees can lead to a questionable integrity and result of research produced by researchers, especially in the central and eastern part of Indonesia. If analyzed further based on respondents' field of scientific disciplines referring to Table 5, then the domination is held by the cluster of social science and humanities, sequence followed by mathematics, science, engineering, and arts cluster; education cluster and health cluster. Interestingly, the field of scientific disciplines of health precisely had the lowest percentage from the questionnaire analysis result, whereas in Indonesia there has been PMK No. 7 of 2016 which regulates the research ethics committee within the field. Lack of ethics awareness should be anticipated immediately, taking into account that ethical committees in health research are crucial to the integrity of conducted research and the credibility to the results of the obtained research. Respondents with their expertise background in social and humanities in Indonesia stated that in college where they work already has an ethics committee. This is an infrequently fact expressed in various scientific sources. The role of ethics committees in social sciences and humanities' field seems to be depended on the number of courses in social and humanities in Indonesia. The government through Kemristekdikti has issued a national standard of higher education, which consists of: (1) national standards of learning; (2) national standards of research and (3) national standards of community service. The ethics committees, especially which handling the research ethics is certainly closely related to the national standards of research. The lack of distribution of ethics committees implied that the implementation of the national standard of education for the academic field, particularly research has largely not been realized, thus requiring more comprehensive anticipation from the government.

The total number distribution of research ethics committee referring to the data of Table 6 is still dominated by universities at the western part of Indonesia, while for the smaller percentage distribution appears in the central and eastern parts of Indonesia. The existence of ethical research committees for each field of scientific disciplines in Indonesia shown in Table 7 is also relatively complete. Interestingly, the field of scientific disciplines within the health field emerged with the smallest percentage distribution of research ethics committees; meanwhile, health is one of the important components of research supported by the legislation existence of research ethics committees at the health sector in Indonesia. Therefore, it can be inferred from the data of Table 6 and Table 7 that, there were many respondents who still have misconceptions between the ethics committee that handles the behavior of civitas academic on both ethics and behavior code at the workplace socially with the research ethics committee related to duties and functions. The respondents of social sciences and humanities experience the greatest misconception, while for the health of sciences discipline respondents did not experience misconceptions about ethical research committees. The issues related to the ethics and integrity of research are not the main focus of lecturers and researchers, but the violations of researcher behavior and research process are its primary concern [2]. The importance of ethics and research integrity is commonly found in the fields of sciences discipline of health, education, and science [2]. This fact showed the appropriate results from this study. Namely, the majority of the three fields of scientific disciplines did not experience misconceptions about research ethics committee. Also, so far the roles, duties, and functions of research ethics committees, as well as the ethics and integrity of the research, have also not been taught mainly at the higher-education curriculum in Indonesia, thus leading to the misconception. Nevertheless, the existence of these misconceptions must be anticipated immediately because the role of the research ethics committee is significant as well as the lecturers or researchers in the college should be concerned and give attention to the function of research ethics committees to keep the integrity of the research.

The importance of ethics and integrity in research, as well as research ethics committees, has been regulated in the Regulation of the Head of Indonesian Institute of Sciences number 08/ E/2013 about the guidelines of Clerical Ethical Research and Scientific Publications [11]. The guidelines clarify that ethical clearance related to the moral acceptance of a series of research processes and the appropriateness of the scientific publication contents. It means that the articles containing results and thoughts of published research should meet the determined ethical code. In other words, this can also assist in research which involves a lot of cooperation and coordination with many different people, the distinct variety of scientific disciplines and institutions, because the existence of a ethics code can encourage the trust, accountability, mutual respect, and justice [12]. Furthermore, the legal basis of research ethics and research ethics committee has been established based on the provisions of regulations or laws in Indonesia, even though there are no specific legal products issued by the government to keep the research ethics committees' existence at every university in Indonesia. The development of an increasingly globalized in the stream of disruption innovation during the industrial revolution 4.0 era also encourages open science and collaboration among researchers and lecturers in the process of research around the world. Open science is essentially an effort to create and disseminate knowledge by sharing data, ideas, and materials openly [13]. Open science makes the opportunity for collaboration among researchers and lecturers around the world to be wide open, and even some of them collaborate across scientific disciplines. Collaboration is generally as a unification of all basic areas of scientific disciplines that spread of 21st-century scientific research [14]. The openness in science and research and the tendency of collaborating across scientific disciplines will create a complexity thus produce new research and innovations. On the other hand, open science and collaboration also cause problems related to the research ethics and ultimately involve the role and function of the ethics committee, particularly the research ethics committee. The possible problems arise related on the responses' data that have been analyzed by us, namely the differential of understanding from the role, duty, and function of research ethics committees, ethics, and integrity of research, handling of data collected in online, as well as the roles and duties in collaboration among researchers. Horner and Minifie [14] also stated that the collaborative issues occurred two decades

ago, led to the many rules related to ethical research that have been made, re-adjusted to ensure the integrity from process and results of research. Open science and research collaboration, besides becoming a trend and increasingly popular in Indonesia undoubtedly will have the implications of the birth of a new research era and can become unmanageable. Moreover, the existence of the different understanding of lecturers or researchers in universities still appears on the research ethics as well as the role and function of research ethics committee and the lack of ethical research committee existence. To prevent the problem, research must meet the code of ethics standards, thus avoided from the exploitations and abuses of research, the research conducted should be suitable with the related competence, and reduced the risk that will be happened [15].

The uniformity of ethical procedures and the presence of moral committees particularly addressing to research at universities become an important purpose, especially in the disruptive innovation and industrial revolution 4.0 era based on open science and collaboration. Therefore, the government through Kemristekdikti needs to initiate the program to increase the quantity, capacity, and quality of research ethics committees. The program is hoped to cover a wide range of field of scientific discipline knowledge, technology and art, in order to maximize the effectiveness and efficiency performance from research ethics committee and develop a mandatory of ethical research guidance as the guidelines for every lecturer in college, which is suitable to development of the 21st century characterized by openness and collaboration.

4. Conclusion

The majority of lecturers or researchers at various universities in Indonesia have understood and considered about the importance of the research ethics committee, even though there are respondents who have misconceptions between the ethics committee that handles the academic behavior in accordance with both ethics and behavior code at the workplace socially with the research ethics committee related to duties and functions. The number of research ethics committees in Indonesia is still small, and the majority only exists in the western part of Indonesia. Furthermore, the disruptive innovation and industrial revolution 4.0 era expose a new tendency from the research world, namely open science and collaboration, which requires the ethical research guidance and as well as the necessity of its governance by 21st-century developments.

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