

CHAPTER I

INTRODUCTION

A. Background

As a nation with a health system and medical schools scattered throughout a large portion of the territory, Indonesia has been regularly generating medical doctors in order to meet the demands of the doctors. By the end of 2019, according to Daeng M. Faqih, Chairman of the Indonesian Medical Association 'Ikatan Dokter Indonesia,' the number of rookie doctors, will have climbed by 10–12 thousand each year, to 180,632 (“Statistik Anggota,”). Subsequently in July 2022, according to Ministry of Health, Budi Gunadi Sadikin, the number of medical doctor registered and hold the medical registration license (STR) is around 140,000 medical doctor.

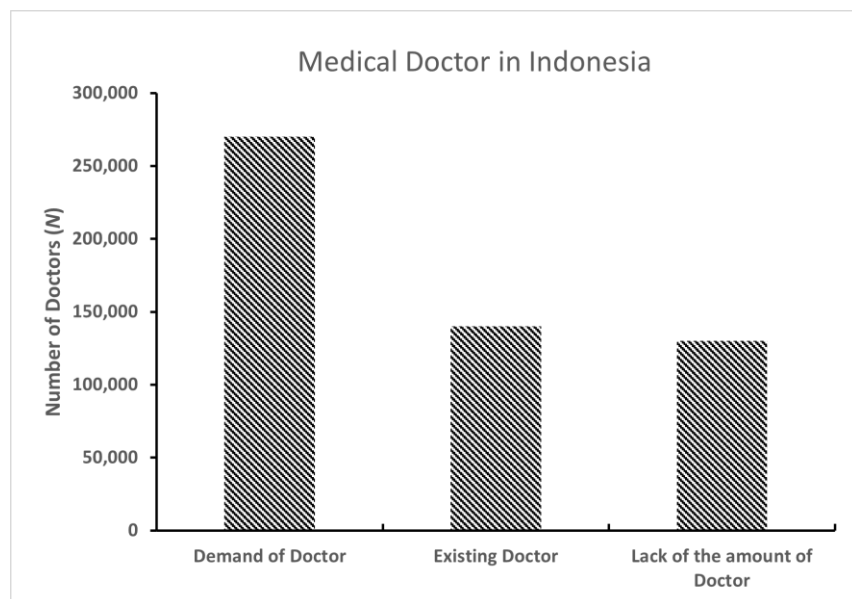


Figure 1.1 The profile of the existence of medical doctor in Indonesia in 2022. Source: Ministry of Health, Republic of Indonesia

However, according to World Health Organization (WHO), the recommendation of doctor population ratio in a nation is a ration of doctor-population as 1:1.000 (Kumar and Pal, 2018). This show that in order to

achieve the doctor-population ratio recommended by WHO, Indonesia with total population of 270 million according to World Bank in 2021, have to acquire 270.000 doctors. This condition generating the problem on the gap between the amount of the medical doctor needed in Indonesia and the present existence of the number of medical doctors available. There is a total of 130,000 doctors need to be generated for the Indonesia to achieve the WHO recommendation on doctor-population ratio. Moreover, in order to make sure the quality of medical doctors an instrument of high stakes assessment/national licensure need to be exist (Babla et al., 2020). In addition, a report from Flexner in 1910 about education coined a concept on the impact of standardization in North America which until now is still relevant as a standardization in medical education (Sharma and Alsaffarini, 2020).

Thus, generating and shaping qualified and standardized doctors throughout Indonesia is a necessary entity to be put in account. As the official council of a medical doctor in Indonesia, the Council of Indonesia Medical Doctors (*Konsil Kedokteran Indonesia*) issued the Indonesia Medical Doctor Competency Standard 'SKDI', a competency-based curriculum for physicians that has become the national standard for medical doctor competency assessment. This Indonesia Medical Doctor Competency was developed by many regulations addressing the quality of higher education. Under Law No. 12 of 2012, the government assumed responsibility for the quality of higher education in the health area.

In Medical School, Faculty of Medicine and Health Sciences, University of Muhammadiyah Yogyakarta, medical students are lectured on materials which have been adjusted with SKDI as the beacon of main competency syllabus and subsequently assessed using a variety of multi-aspect assessments, including Multiple Choice Questions (MCQ) for assessing theory, Objective Structure Clinical Examination (OSCE) for assessing skills, and Tutorials for assessing personal understanding during

group discussion in Problem Based Learnings. The grades are calculated using 23 blocks, and pupils are reviewed and evaluated after each block for the MCQ and each semester for OSCE.

It has been well-known in the medical education field that assessment drives learning. Thus, the process of the assessment itself is critical to articulate its purpose, whether assessment of learning or assessment for learning (Ferris and O' Flynn, 2015; Lockyer et al., 2017). The approach of assessing Central-based Medical Education (CBME) should begin with outcomes; therefore, optimizing assessment in CBME epoch requires multiple methods, multiple assessors, the selection and training of assessors, a reconceptualization of the role of psychometrics, and recognition of the importance of group process in reaching critical decisions about competence (Frank et al., 2010; Lockyer et al., 2017)

The competency exam for the medical doctor is held by Indonesia Doctor Collegium (KDI) in association with Indonesia Medical Doctor Institution Association (AIPKI) which both constructed a joint-committee for Indonesia Medical Doctor Competency in 2007 became the first Indonesia Medical Doctor Competency Exam (UKDI) that held 4 times a year which assess doctor competition in knowledge, skills and affective aspects. The results of UKDI over time acquired continuous improvement., implementation of competency exam from methods, passing grade and organizing the exam itself and over the time turned into Competency Exam for Medical Student Profession Program (UKMPPD) by 2013 that devoted in Law (No). 20 of 2013 that stated Competency Exam for Indonesia Medical Student Profession Program (UKMPPD) held on a national level should be taken before taking Hippocratic Oath.

The National Licensing Examination for Indonesia or UKMPPD comprise test materials which made reference to Indonesia Medical Doctor Standard Competency (SKDI), which are offered in two forms: Multiple Choices Questions (MCQ-CBT) and Objective Structured Clinical

Examination (OSCE) (Hidayah, n.d.; Rahayu et al., 2021). MCQs are designed to assess theoretical understanding, such as the application of biomedicine, management in primary healthcare, procedural knowledge, and degree of knowledge and know-how. When developed with a large sample size of MCQ items, MCQs have a high level of reliability and validity (Epstein, 2007). While the Objective Structured Clinical Licensing Examination (OSCE) is designed to assess objective structured clinical competency through demonstration and application of skills to standardized patients. (Couto et al., 2019).

A standard or cut point reserves as a delineation between students who perform well/pass and those who do not/fail need to be set as a measurement tool to determine a participant's pass/fail status(Norcini, 2003). In light of this condition, complete justice, as Allah stated in Surat Al Muthaffifin (83:1–6), refers to how a human being shall not be dishonest or deceive in any favor..am

وَيْلٌ لِّلْمُطَفِّفِينَ الَّذِينَ إِذَا أَكْتَالُوا عَلَى النَّاسِ يَسْتَوْفُونَ وَإِذَا كَالُوهُمْ أَوْ
 وَزَنُوهُمْ يُخْسِرُونَ أَلَا يَظُنُّ أُولَٰئِكَ أَنَّهُمْ مَبْعُوثُونَ لِيَوْمٍ عَظِيمٍ يَوْمَ
 يَقُومُ النَّاسُ لِرَبِّ الْعَالَمِينَ

“(1) Woe to the defrauders!, (2) Those who take full measure ‘when they buy’ from people, (3) but give less when they measure or weigh for buyers. (4) Do such the Day ‘all’ people will stand before the Lord of all worlds? people do not think that they will be resurrected,(5) for a tremendous Day, (6) and what will make you realize what Sijjîn is?—

The procedure of establishing a cut score on an examination is often employed in licensure and certification testing programs, particularly

medical licensure examinations such as the UKMPPD and USMLE. (Downing and Haladyna, 2006; Ward et al., 2018). In addition, standard settings have been adopted since this method is capable of representing participants who demonstrate competence and those who do not, allowing the institution to take full responsibility for participant competency (Downing and Haladyna, 2006). The accuracy and validity of standard-setting direct this method to be used as predictor for the passing of an exam. (Brallier, n.d.; Carr et al., 2018).

Nations throughout the world conduct similar Medical Competency Examination (Archer et al., 2015). In United States, Every medical students who wish to obtain their own medical license are oblige to pass the United States Medical Licensing Examination (USMLE) (Haist et al, 2017). The National Board of Medical Examiners (NBME) and the Federation of States Medical Boards (FSMB) are the institution that in charge for administrating the USMLE. USMLE consists of three stages: Step 1 is intended to assess the critical concepts of basic sciences relevant to the practice of medicine, Step 2 is intended to determine the ability to apply medical knowledge, skills, and comprehension of clinical sciences; and Step 3 is intended to assess the biomedical and clinical sciences necessary for the unsupervised practice of medicine. (Kim and George, 2018; Muller et al., 2003)

One of the similarities between the UKMPPD and the USMLE as a medical competency examination includes Multiple Choice Questions (MCQ) and an OSCE or Step 2 Clinical Skill (CS) Examination. MCQs are effective in assessing a broad range of learner comprehension in a concise period and can be used to test understanding, knowledge, analysis, and application (Collins, 2006). While the OSCE focuses on clinical skills, psychomotor, and emotional abilities, it is primarily an examination of the "show how" level of Miller's pyramid (Yazbeck Karam et al., 2018). Both the MCQ and OSCE as instruments used in the final medical competency evaluation are also used in preclinical to assess student achievement.

Throughout preclinical year, tutorial sessions is also held as part of problem-based learning (PBL) to evaluate students' performance in terms of concept integration, attitude, communication, and concept integration in application from taught content(Couto et al., 2019). Moreover, tutorial session is a main part of formative assessment in medical education in which also aim to navigate undergraduate students to shape and increase their competence(Couto et al., 2019). One of indicator of assessment in tutorial session, especially in School of Medicine of University of Muhammadiyah Yogyakarta is the miniquiz where it held after second meeting on tutorial session. The medical students were given questions regarding clinical topic which being discussed where miniquiz objective to evaluate the comprehension of the clinical problem which in the tutorial is being discussed. To the best knowledge of the researcher, there is still low the research in Pubmed MEDLINE database or other medical education journal which discuss or study about the role of miniquiz as one of the assessment instrument in undergraduate medical school. Furthermore, miniquiz tutorial is contributing 50% in the percentage formula of tutorial session score in school of medicine, University of Muhammadiyah Yogyakarta so that the relation between miniquiz need to be studied further. The undergraduate assessment consisting of preclinical MCQ, preclinical OSCE, and tutorial miniquiz are becoming important to assess students in undergraduate term, which subsequently will take high stake National Licensing Examination (UKMPPD) in order to obtain the degree of doctor, therefore further investigation about preclinical MCQ, OSCE, and tutorial miniquiz toward UKMPPD should be made in order to determine as potential predictors of the pass of UKMPPD.

Based on background, the researcher aims to use preclinical MCQ, preclinical OSCE, and tutorial miniquiz score as the predictors for the National Licensing Examination (UKMPPD) for medical students in School of Medicine, Faculty of Medicine and Health Sciences, University Muhammadiyah Yogyakarta.

B. Research Questions

Based on the background, it can be formulated the question:

1. Does the grades of preclinical MCQ, OSCE and Tutorial Miniquiz can predict National Licensing Examination Passing Exam?

C. Research Objective

1. General Objective

The objective of the research is investigating the preclinical MCQ, preclinical OSCE, and Tutorial Miniquiz as the predictor for the high stake National Licensing Examination (UKMPPD) in school of medicine, Faculty of Medicine and Health Sciences, University of Muhammadiyah Yogyakarta

2. Specific Objective

1. To investigate preclinical MCQ, preclinical OSCE, and tutorial miniquiz as the predictor for high stakes National Licensing Examination (UKMPPD) in cohort 2013, 2014, and 2015
2. To predict National Licensing Examination using Standard Error Measurement 95 (SEM 95) modeling based on preclinical/undergraduates MCQ score

D. Research Benefit

1. For Researcher

- a. Getting able to increase the ability the field of in research analysis
- b. Getting able to increase the knowledge about National Licensing Examination and medical competency

2. For Institution

- a. This research is expected to be able for mapping the medical students who are going to take National Licensing Examination based on the previous assessment in the preclinical stage
- b. Take pre-cautions before the National Licensing Examination (UKMPPD) for the students and the faculty, so they both have the chance to navigate earlier and move in the right direction
- c. Increase quality of National Licensing Examination level of graduate Faculty of Medicine University of Muhammadiyah Yogyakarta

E. Research Authenticity

Tabel 1.1 Research Authenticity

No	Research title and writer	Variable	Type of research	Difference	Similarity	Result
1	Predicting Student's Board Examination Performance using Classification Algorithms (Rustia et al., 2018)	- Prediction of Licensure Examination	- Descriptive statistic, data mining	- On the previous research by Reynold, et al. use descriptive statistic with data mining, while on this research use case study	- Both using a set of data of student performance to predict Licensure Examination	The performance of the Naive Bayes classifier has all accuracy is 62.98%, The performance of Neural Network classifier accuracy is 65.67% The performance of the C4.5 Decision Tree classifier is 73.10% The performance of logistic regression classifier is 60.53%
2	Predicting Success in College: The Importance of Placement Tests and High School Transcripts	- Prediction of grade and performance - High school GPA	- Observational with Cohort approach	- On the previous research by Belfield, et al. use cohort studies while on this	- Both are using grade/assessment on the previous stage as predictor	High school GPA has correlation with college GPA

	(Belfield and Crosta, n.d.)				research use case study		
					- Research by Belfield, et al used high school GPA as predictor		
3	Predicting Medical Student Success on Licensure Exam (Gullo et al., 2015)	- Prediction of Medical Student success in licensure exam - MCAT	- Observational with cohort study approach	- Previous Research by Gullo, et al use observational with cohort study while on this research use case study	- Both using MCQ		Pre admissions adds very little to the prediction of failure of Step 1 or Step 2 USMLE
				- Research by Gullo uses Medical Admission Test as predictor			
