

## THE RELATIONSHIP BETWEEN UNDERGRADUATE GPA AND UKMPPD CBT SCORE OF MEDICAL STUDENTS AT UDAYANA UNIVERSITY IN MAY 2022

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### ABSTRACT

The Competency Test for Medical Professional Program Students (UKMPPD) is a test to standardize the quality of Indonesian doctors. However, the number of students who fail on Computer-Based Test (CBT) UKMPPD were increasing, as well as at Udayana University. Undergraduate Grade Point Average (GPA) considered related to the UKMPPD pass rates. Several studies related to those relationship have been conducted, but showed varied results. This research aims to determine the relationship between undergraduate GPA and UKMPPD CBT score among students of Faculty of Medicine, Udayana University, May 2022. This study is a cross-sectional analytical study using secondary data obtained from Academic Division of Faculty of Medicine, Udayana University, with a total of 181 students as participants. The data were analyzed using SPSS ver. 25 with univariate, bivariate, and multivariate analyses. The study were dominated by females (64.1%), 23 years old (42.5%), and students of batch 2016 (97.8%). There was a significant positive moderate relationship between undergraduate GPA and UKMPPD CBT score ( $p = 0.000$ ;  $r = 0.564$ ). The results of the multivariate analysis showed that undergraduate GPA was a variable that significantly and consistently associated with UKMPPD CBT score (coefficient = 24.052; correlation coefficient = 0.601;  $p = 0.000$  ( $< 0.001$ )). This study showed that there was a significant positive moderate relationship between undergraduate GPA and UKMPPD CBT score. This variable was significantly and consistently related to the UKMPPD CBT score compared to three variables tested simultaneously.

**Keywords :** undergraduate GPA., UKMPPD CBT score., medical students

### INTRODUCTION

One of the important roles in ensuring health of community is the availability of quality health workers. Doctors are the main health workers who are believed to be able to solve all health problems through cooperation with other health workers. Carrying out a very heavy task because related to lives and safety of patients, doctors are required to have good knowledge and skills. The educational factor is the main factor determining the fulfillment of this quality. The Indonesian Doctors Competency Standards (SKDI) were formed as a reference for the development of the Competency-Based Curriculum (KBK) and the development of the Competency Test for Medical Professional Program Students (UKMPPD). The Competency Test for Medical Professional Program Students (UKMPPD) is a competency test that is stated as the implementation of various medical practices in order to improve and standardize the quality of Indonesian doctors.<sup>1</sup> This competency test is carried out in two stages, namely CBT (Computer-Based Test) and OSCE (Objective Structure Clinical Examination). Through this test, the authority in granting certificates will receive comprehensive

information related to attitudes, knowledge, and skills of general practitioner graduates so they are able to consider granting a certificate of competence as a requirement for registration of a doctor in applying for a license to practice (SIP).<sup>2</sup> In summary, this competency test as a means to maintain the competency standards of general practitioner graduates, as an effort by government to protect health services that will be received by the community.<sup>3</sup>

The number of students who fail on Computer-Based Test (CBT) UKMPPD were increasing. The Ministry of Research, Technology and Higher Education stated that there were nearly 40 thousand medical students failed in this test from 2014 to 2018.<sup>4</sup> According to data from the National Committee for UKMPPD (PN-UKMPPD), the failure rates in each competency test attempt shows fluctuations.<sup>5</sup> At Udayana University, the pass rate on UKMPPD has not reached 100% of all students who took the exam in that period as first-takers. The failure rate of CBT UKMPPD at Udayana University in February 2018 and February 2019 were 8.23% and 11.11%, respectively. The failure rate in February 2019 increased by 58.77% in the August period of the following year.

Referring to description of the failure rates of UKMPPD, there is an urgency to overcome this problem. Several factors are considered to have correlation with UKMPPD pass rates, one of which is the student's undergraduate GPA (Grade Point Average). Several studies related to the relationship between undergraduate GPA and UKMPPD CBT score have been conducted and show varied results. The study by Febrianti *et al.* (2017) states that there is a relationship between undergraduate GPA and UKMPPD CBT score with positive strong interpretation.<sup>6</sup> This also supported by the results of other studies, a positive relationship with moderate correlation strength.<sup>7-9</sup> However, research by Pitra & Akbar (2019) explains that there is a weak negative relationship between undergraduate GPA and UKMPPD CBT score.<sup>10</sup>

Based on the UKMPPD pass rates that has not been maximized, further research is needed. This research was conducted in the aim of examine the relationship between undergraduate GPA and UKMPPD CBT score in students of the Medical Professional Study Program, Faculty of Medicine, Udayana University so it can be used as a reference for prevention and policy improvements efforts for institutions.

## MATERIALS AND METHODS

This study is an analytic study with a cross-sectional approach. Data collection was done by retrospective method. Data collection was in the form of secondary data obtained from the Academic Division of the Faculty of Medicine, Udayana University and primary data using an online-based questionnaire. The target population were all students of the Faculty of Medicine, Udayana University who participated in the UKMPPD. The samples were students of the Faculty of Medicine, Udayana University who participated in UKMPPD in

May 2022 and fulfilled the inclusion and exclusion criteria. The inclusion criteria were students of the Faculty of Medicine, Udayana University who participated in UKMPPD in May 2022 as first takers and had complete variable data needed. Meanwhile, the exclusion criteria were students of the Faculty of Medicine, Udayana University who took part in UKMPPD in May 2022 as retakers and/or students of the Faculty of Medicine, Udayana University who took part in the UKMPPD in May 2022 but did not have complete variable data needed. The minimum sample size required was calculated using the sample size formula for correlation research with a two-way hypothesis, namely 74 people. Samples were selected sequentially from the data of the Academic Division of the Faculty of Medicine, Udayana University until the desired sample size was reached. The independent variable is undergraduate GPA, while the dependent variable is UKMPPD CBT score, and the confounding variables in this study are length of undergraduate study period and tutoring.

The collected data was then analyzed for normality of data using Kolmogorov-Smirnov test, univariate analysis, bivariate analysis, namely Spearman correlation test, and multivariate analysis in the form of linear regression analysis. This study has obtained ethical eligibility before data collection is carried out, with ethical eligibility number are 255/UN14.2.2.VII.14/LT/2023.

## RESULTS

The research included 181 students who had met the inclusion and exclusion criteria. The characteristics of the participants consisted of gender, age, and batch of students. The characteristics of the participants are presented in **Table 1**.

**Table 1.** Characteristics of participants

| Variable | Frequency (n) | Percentage (%) |
|----------|---------------|----------------|
| Gender   |               |                |
| Male     | 65            | 35.9           |
| Female   | 116           | 64.1           |
| Age      |               |                |
| 21       | 6             | 3.3            |
| 22       | 10            | 5.5            |
| 23       | 77            | 42.5           |
| 24       | 76            | 42             |
| 25       | 10            | 5.5            |
| 26       | 2             | 1.1            |
| Batch    |               |                |
| 2015     | 4             | 2.2            |
| 2016     | 177           | 97.8           |
| Total    | 181           | 100            |

As shown in **Table 1**, 65 participants (35.9%) were male and 116 participants (64.1%) were female. The frequency of participants with the age of 21 years was 6 people (3.3%), 22 years was 10 people (5.5%), 23 years was 77 people (42.5%), 24 years was 76 people (42%), 25 years was 10 people (5.5%), and

26 years was 2 people (1.1%). A total of 4 people (2.2%) were students of batch 2015, 177 people (97.8%) were students of batch 2016 of the Undergraduate Medical Study Program, Faculty of Medicine, Udayana University.

The univariate analysis in this study consisted of undergraduate study period, and tutoring. undergraduate GPA, UKMPPD CBT score, length of

**Table 2.** Results of univariate analysis of undergraduate GPA and UKMPPD CBT score

| Variable          | Frequency (n) | Percentage (%) | Mean            |
|-------------------|---------------|----------------|-----------------|
| Undergraduate GPA | 181           | 100            | 3.52 (SD 0.166) |
| UKMPPD CBT score  | 181           | 100            | 77.5 (53, 89.5) |

As seen in **Table 2**, the average undergraduate GPA of 181 participants was 3.52 (SD 0.166) while the average UKMPPD CBT score of 181 participants was 77.5 (53, 89.5).

**Table 3.** Results of univariate analysis of length of undergraduate study and tutoring

| Variable                      | Frequency (n) | Percentage (%) |
|-------------------------------|---------------|----------------|
| Length of undergraduate study |               |                |
| Prolonged                     | 12            | 6.6            |
| Non prolonged                 | 169           | 93.4           |
| Tutoring                      |               |                |
| Yes                           | 171           | 94.5           |
| No                            | 10            | 5.5            |
| Total                         | 181           | 100            |

As shown in **Table 3**, based on the length of their undergraduate study period, 12 participants (6.6%) had prolonged studies, while 169 participants (93.4%) did not have prolonged studies. Of the 181 participants, 171 participants (94.5%) took a tutoring before UKMPPD, while 10 participants (5.5%) did not took a tutoring before UKMPPD.

**Table 4.** Results of bivariate analysis between undergraduate GPA and UKMPPD CBT score

|                   |          | UKMPPD CBT score |
|-------------------|----------|------------------|
| Undergraduate GPA | <i>r</i> | 0.564            |
|                   | <i>p</i> | 0.000            |
|                   | <i>n</i> | 181              |

Spearman correlation test

Based on the Kolmogorov-Smirnov test for normality, the data were not normally distributed ( $p = 0.035$ ). The Spearman correlation test as seen in **Table 4** showed a significant positive relationship with a moderate strength

between undergraduate GPA and UKMPPD CBT score ( $p = 0.000$  and  $r = 0.564$ ). This indicates that there was a significant relationship between undergraduate GPA and UKMPPD CBT score. The higher the undergraduate GPA, the higher the UKMPPD CBT score that can be obtained.

**Table 5.** Results of multivariate linear regression analysis

| Step   | Variable                      | Coefficient | Correlation coefficient | <i>p</i> |
|--------|-------------------------------|-------------|-------------------------|----------|
| Step 1 | Undergraduate GPA             | 23.122      | 0.577                   | <0.001   |
|        | Length of undergraduate study | 1.668       | 0.063                   | 0.327    |
|        | Tutoring                      | 1.478       | 0.051                   | 0.398    |
|        | Constanta                     | -6.305      |                         | 0.463    |
| Step 2 | Undergraduate GPA             | 23.184      | 0.579                   | <0.001   |
|        | Length of undergraduate study | 1.742       | 0.065                   | 0.305    |
|        | Constanta                     | -6.511      |                         | 0.448    |
| Step 3 | Undergraduate GPA             | 24.052      | 0.601                   | <0.001   |
|        | Constanta                     | -7.936      |                         | 0.349    |

A linear regression analysis that tested three variables simultaneously (undergraduate GPA, length of undergraduate study period, and tutoring) showed that only undergraduate GPA variable was significantly and consistently associated with UKMPPD CBT score as shown in **Table 5**. This variable can be used to predict UKMPPD CBT score with a correlation of 0.601. The equation obtained is as follows:

$$y = \text{constant} + a_1x_1 + a_2x_2 + \dots + a_nx_n$$

$$y = -7.936 + 24.052 (\text{undergraduate GPA})$$

The p value in ANOVA test was <0.001, so the equation is said to be valid for use ( $p = <0.05$ ). The Adjusted R Square value of 35.7% indicates that the equation above can explain UKMPPD CBT score by 35.7%, while the remaining 64.3% is explained by other variables that were not studied in this research. This figure of 35.7% is also able to explain the moderate strength correlation that was found between the relationship of undergraduate GPA and UKMPPD CBT score.

## 1. DISCUSSION

Based on the results of statistical tests in this study, the relationship between undergraduate GPA and UKMPPD CBT score showed  $p = 0.000$  ( $p < 0.05$ ) and  $r = 0.564$ . This value indicates a significant positive correlation with a moderate strength. This finding is consistent with the results of previous studies by Alexandra *et al.* (2021); Pratiwi YS (2016); Suswati & Rahayu (2019), which also found a significant positive correlation with a moderate strength between undergraduate GPA and UKMPPD CBT score.<sup>7-9</sup>

According to the Regulation of the Ministry of Education, Culture, Research, and Technology of the Republic of Indonesia Number 53 of 2023 on the Assurance of Higher Education Quality states that the GPA is an assessment of student learning outcomes in a course.<sup>11</sup> Several studies have shown that GPA is not only used as a learning outcome, but can also be used as a predictor for cognitive exam results. The score is proven to be a significant predictor because it is able to reflect student's academic abilities, understanding, consistency and discipline, and time management, all of which are important for performance in competency tests. The significant relationship between undergraduate GPA and UKMPPD CBT score is based on the similarity of assessment between the two programs. The assessment is composed of MCQs (multiple-choice questions) that prioritize the cognitive domain based on basic clinical knowledge that is obtained during the undergraduate phase.<sup>6,7</sup>

However, the results of this study showed different results from the study conducted by Febrianti *et al.* (2017) which found significant positive result between undergraduate GPA and CBT UKMPPD CBT score with a strong relationship strength ( $r = 0.770$ ).<sup>6</sup> Another study by Pitra & Akbar (2019) also showed different results, namely there was a weak negative correlation between

undergraduate GPA and UKMPPD CBT score at Baitturahmah University ( $r = -0.221$ ).<sup>10</sup> This is likely due to differences in undergraduate assessment system, in the form of minimum passing grade and the implementation of remedial exams between Udayana University and Sam Ratulangi and Baitturahmah Universities. Additionally, the sample size of Pitra & Akbar (2019) study was 749, which could have contributed to the different results when assessing the relationship between undergraduate GPA and UKMPPD CBT score.

The results of multivariate analysis in this study, which analyzed three variables simultaneously to assess their relationship with UKMPPD CBT score, showed that undergraduate GPA was significantly and consistently associated with UKMPPD CBT score (coefficient = 24.052; correlation coefficient = 0.601;  $p = 0.000$  ( $<0.001$ )). Other variables, namely length of undergraduate study period and tutoring, were not significantly and consistently related to UKMPPD CBT score. The results of this study are also consistent with studies by Mardi (2018); Suswati & Rahayu (2019) which state that the variable that has the most influence on UKMPPD CBT score is undergraduate GPA ( $p = 0.000$ ).<sup>9,12</sup> As a learning outcome indicator, undergraduate GPA is able to reflect the success of learning process in achieving student mastery of knowledge. It functions as a scoring system, summarizing, and assessing student's academic performance. A satisfactory undergraduate GPA suggests strong academic performance and sufficient comprehension of the studied material, potentially affecting subsequent cognitive exam performance.<sup>13,14</sup>

Based on the results of multivariate analysis, tutoring outside campus learning hours was not significantly and consistently related to UKMPPD CBT score with  $p = 0.398$  ( $p > 0.05$ ) and correlation coefficient = 0.051. Among the other two variables tested simultaneously, the tutoring variable had the largest p value, indicating that tutoring was considered as the least significant variable related to UKMPPD CBT score. This findings supports the results of a study by Lidiawati (2018) which found a relationship between tutoring and UKMPPD pass rate, but with a very weak correlation coefficient of 0.05 and a p-value of 0.022, or even no relationship at all.<sup>15</sup> Other studies stated that many factors also play a role in influencing student success in tutoring, including the student's prior knowledge gained during undergraduate and professional education, as well as the tutoring methods used.<sup>16</sup> However, this study found different results from studies by Endriani (2021); Kedokteran *et al.* (2021); Lisiswanti *et al.* (2017), which found a significant relationship between tutoring outside campus learning hours and UKMPPD CBT score or pass rates.<sup>16-18</sup> In further analysis, the researcher interviewed respondents who did not take tutoring for UKMPPD. Most of these respondents reported that they studied diligently on their own or in groups with students who were attending tutoring. They also stated that they were able to indirectly summarize and review material from other students who may have come from different tutoring programs. This



finding strengthens the statement that tutoring does not have a significant relationship with UKMPPD CBT score in this study. With or without tutoring, good cognitive test scores can be obtained based on individual understanding and high motivation.<sup>16,19–21</sup>

Based on the results of multivariate analysis, length of undergraduate study period was not significantly and consistently associated with UKMPPD CBT score with  $p = 0.305$  ( $p > 0.05$ ) and correlation coefficient = 0.065. Similar findings were reported by Dwiyantri (2017), who found no significant relationship between the length of undergraduate study period and UKMPPD pass rate ( $p = 0.07$  ( $p > 0.05$ )).<sup>22</sup> However, this contradicts other studies, such as those by Arifiana (2022) and Siregar *et al.* (2018), which found a significant correlation between length of undergraduate study period and UKMPPD CBT score or pass rates ( $p = 0.000$ ,  $p < 0.05$ ).<sup>23,24</sup>

This study proves that the length of undergraduate study period does not have a significant relationship with UKMPPD CBT score. The results of this study can be explained because the length of study period can be affected by many factors, both internal and external factors of students. Prolonged study periods in students does not necessarily reflect that the student has worse academic abilities than students with on-time or non-prolonged study periods. No studies have been found to show that the length of study period is used as an indicator to assess the academic abilities of students. Several factors that may affect the length of study period of students include physical, psychological, fatigue, interest, motivation, ability, family, university, and society.<sup>25</sup>, some of which were found to occur in respondents with prolonged study periods in this study. Some respondents said that there were no dominant academic problems that hindered the completion of undergraduate studies so the possibility of the cause of prolonged study periods did not come from academic side. This can clarify the results of this study that the length of undergraduate study period was not found to have a significant relationship with UKMPPD CBT score which in essence assesses the academic abilities of students.

## 2. CONCLUSION AND RECCOMENDATION

There was a significant positive relationship between undergraduate GPA and UKMPPD CBT score with moderate correlation strength. This means that the higher the undergraduate GPA, the higher the UKMPPD CBT score that can be obtained. In addition, the undergraduate GPA was a variable that significantly and consistently associated with UKMPPD CBT score of the three variables that were tested simultaneously.

The suggestions that can be proposed by researcher regarding results of this study are to intervene in undergraduate GPA, as this is the factor with the strongest and most consistent relationship with UKMPPD CBT score. Further researches should be conducted on larger scale on other variables that may contribute to UKMPPD CBT score,

as well as on undergraduate GPA, as this value can be influenced by many factors.

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