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Original Article

The Correlation Of Academic Performance With Progress Test Score In Preclinic Students

Fuad Khadafianto [1], Itsna Chairunnisa [2]

[1]*Department of Medical Education Faculty of Medicine Universitas Islam Indonesia*
[2]*Student of the Faculty of Medicine Universitas Islam Indonesia*
E-mail Corresponding: fuad.khadafianto@uii.ac.id

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ABSTRACT

Background: : A problem-based learning curriculum is a curriculum that starts with problems and then studies to gain knowledge and skills. One of the curriculum weaknesses is that the students prefer clinical to basic medical knowledge. Student knowledge will be good if they have understood basic knowledge in the learning process. **Objectives**: Knowing the correlation between first-year academic performance and phase 1 PT scores (basic medical content) to 1, 2, 3 and 4 in preclinical students at the FK UII

Methods: This study is an analytic observational study with a cross-sectional design. The sampling technique used purposive sampling on FK UII students in 2018, 2019 and 2020 (n = 471). Secondary data collection was taken from the academic division of FK UII. Correlation analysis using the Spearman test.

Results: The results of the correlation between the academic performance and PT (phase 1) to 1st, 2nd, 3rd and 4th scores are significant (p <0.01). In the 2018 students, there is a weak correlation at 1st PT (phase 1) (r = 0.231), 2nd PT (phase 1) is a strong correlation (r = 0.664), 3rd PT (phase 1) is a weak correlation (r = 0.378) and 4th PT (phase 1) is a moderate correlation (r = 0.490). In the 2019 students, 1st PT (phase 1) is a weak correlation (r = 0.266), 2nd PT (phase 1) is a strong correlation (r = 0.607), and 3rd PT (phase 1) is a moderate correlation (r = 0.426). In the class of 2020, 1st PT (phase 1) has a moderate correlation (r = 0.493), and 2nd PT (phase 1) has a weak correlation (r = 0.322).

Conclusion: There is a correlation between academic performance and progress test scores in preclinical students at the medical faculty, Universitas Islam Indonesia.

INTRODUCTION

Problem-based curriculum starts with problems and is then studied to gain knowledge and skills. One curriculum weakness is that the students are more interested in clinical knowledge than basic medical science. Students will have good knowledge if they have studied basic knowledge in their learning process. However, most students experience a decrease in basic knowledge retention, so an evaluation is needed using an assessment. In medical education, assessment can be either summative or formative. The summative assessment aims to assess each student's progress at the end of learning, while the formative assessment assesses during the learning process.1 An example of a summative assessment is the GPA score,

while an example of a formative assessment is the progress test (PT) score.

The GPA score in the undergraduate medical study program at the Faculty of Medicine at the Universitas Islam Indonesia (FK UII) can be obtained from block score, non-block score and medical skill based on the percentage assessment. The final scores are adjusted to the standards at UII; the maximum value for letter A is a score of 4.00, ranging from 80-100, while the minimum score for letter E is a score of 0.00 or less than 40. The final decision of the student's score is determined in the final grade determination meeting.2 GPA is one of the factors to measure student academic performance.3

PT has been held at FK UII since 2012 for all preclinical students, while for clinical students in 2018.4, PT at FK UII is held once per year in odd semesters and must be followed by all students because PT participation is one of the requirements for final decision.2 The aim of PT in the medical curriculum is to encourage meaning-oriented learning and increase long-term knowledge retention. PT is a comprehensive test that gradually assesses students' abilities and performance.6 It is important for medical students' knowledge to be reviewed regularly four times.5 The progress of knowledge is seen from a steady increase in scores every year.7

Table 1. Data Analysis

	IPK (GPA)				PT (Phase 1)			
	1	2	3	4	PT1	PT2	PT3	PT4
2018	√	√	√	√	√	√	√	√
2019	√	√	√		√	√	√	
2020	√	√			√	√		

Assessment for basic medical science can be seen from the summative assessment of GPA score in the first year, while formative score can be seen from PT phase 1 score. PT phase 1 consists of basic medical knowledge such as anatomy, physiology, histology, biochemistry, pharmacology, microbiology, forensics, medicolegal and medical education.

Knowledge of basic medical science is the basis for decision-making.8 Analysis of PT results at medical faculty in Medan shows that students' PT scores will be higher according to the length of the student's study period; these results indicate that students in years 3 and 4 will get higher scores than students in years 1 and 2. However, based on the question categories, which were divided into basic and clinical medicine, final-year students have more difficulties in the basic medical science category because students are more exposed to clinical problems than in the basic medical sciences they have learned in the first year of their studies so that they may have been forgotten.5

In addition to evaluating using assessments, a spiral curriculum design also supports the retention of basic medical knowledge at FK UII. The spiral medicine curriculum is designed to cover material repeatedly but progressively by building basic concepts and deeper content. The principle of the spiral curriculum is to deepen understanding related to previous learning to provide strong understanding and knowledge retention.9

Therefore, good basic medical science performance from the first year's GPA scores is expected to have good retention on phase 1 PT scores (basic medical content).

METHOD

The research is an analytic observational study with a cross-sectional design. The research sample used a purposive sampling of FK UII students in 2018, 2019 and 2020 (n = 471) with inclusion criteria for active FK UII students and exclusion criteria for students who did not

complete preclinical PT according to their level. Secondary data collection was taken from the academic division of FK UII. Analysis using SPSS software. Correlation test using Spearman test.

RESULT AND DISCUSSION

Characteristics of Research Subjects

The subjects of this study were 480 students of the Faculty of Medicine at the Islamic University of Indonesia, consisting of 138 students in the class of 2018, 164 students in the class of 2019 and 178 students in the class of 2020. Four students were in class 2018, 3 in class 2019, and 2 students from batch 2020 were not included in the analysis because they needed to take the complete PT.

Based on Table 2, the class of 2020 has the most significant number of students, and the class of 2018 has the smallest. Based on gender, the total number of female students is greater than the number of male student.

Table 2. Average Weekly Body Weight of White Mice During the Study

Class	Gender		Total
	Man	Woman	
2018	46	88	134
2019	48	113	161
2020	44	132	176
Total	139	333	471

Description of GPA Scores and Progress Test Scores

Based on Table 3, the highest average GPA score is the class of 2019, 3.35, and the lowest average GPA score is the class of 2018, 3,14.

Table 3. GPA Score Description

		Min	Max	Mean
Class	2018	2.07	3.96	3.1435
	2019	1.73	3.97	3.3504
	2020	2.00	3.99	3.27223

Table 4. The Average PT (phase 1) Score in the 2018-2020 Class

PT (phase 1)	N	Min	Max	Mean	SD
PT 1	471	3	26	15.11	3.510
PT 2	471	3	40	18.58	6.982
PT 3	295	5	27	15.76	3.960
PT 4	134	8	30	19.57	4.463

Table 5. PT (phase 1) Score by Class

Class	PT (phase 1)	N	Min	Max	Mean	SD
2018	PT 1	134	3	23	14.84	3.444
	PT 2	134	6	40	25.22	6.587
	PT 3	134	6	27	17.31	4.255
	PT 4	134	8	30	19.57	4.463
2019	PT 1	161	8	26	16.34	3.305
	PT 2	161	3	31	19.65	4.380
	PT 3	161	5	20	14.47	3.174
2020	PT 1	176	7	23	14.19	3.433
	PT 2	176	6	21	12.61	2.914

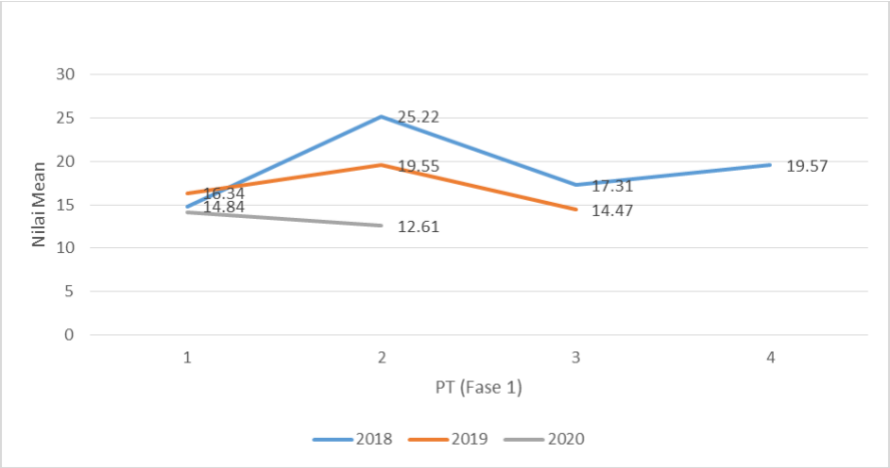

Figure 1. Graph of PT (phase 1) score by class

Based on Table 4, it can be seen that the average score of the 1st PT (phase 1) in the overall class of 2018 – 2020 has the lowest score of 15.11, then the 2nd PT (phase 1) has increased to 18.58, and the 3rd PT (phase 1) decreased again to 15.76, and the 4th PT (phase 1) increased to reach an average value of 19.57.

Based on Figure 1, the PT (phase 1) score, as seen by class, almost has the same characteristics as the overall average PT (phase 1) score). In the class of 2018, the 1st PT (phase 1) has the lowest average score of 14.84. Then, the 2nd PT (phase 1) score increased to 25,22, and the 3rd PT (phase 1) decreased back to 17,31, and in the 4th PT (phase 1) increased to reach an average score of 19,57.

In the class of 2019, the 1st PT (phase 1) score has the lowest average score of 16.34, the 2nd PT (phase 1) increased to 19.65, and the 3rd PT (phase 1) decreased again to 14.47. Meanwhile, the class of 2020 has quite different characteristics from those of 2018 and 2019. The 1st PT (phase 1) score is higher, 14.19, than the 2nd PT (phase 1), which is 12.61.

Correlation of GPA Scores with Progress Test Scores

In the correlation test with numeric-numeric variables, the normality test for the 2018 and 2020 GPA scores has a p>0.05 so that it has a normal data distribution, while the GPA score for the 2019 class and all PT scores for the 1st, 2nd, 3rd and 4th in the

class 2018, 2019 and 2020 have a p-value <0.05 which indicates that the data distribution is not normal. Therefore, the correlation uses the Spearman test because one or both of the data variables are not normally distributed in the 2018, 2019, and 2020 classes.

Table 6. Results of correlation analysis based on generation

Class	IPK 1	PT (phase 1)	N	p	r
2018	IPK 1	PT 1	134	<0,01	0.231
		PT 2	134	<0,01	0.664
		PT 3	134	<0,01	0.378
		PT 4	134	<0,01	0.490
2019	IPK 1	PT 1	161	<0.01	0.266
		PT 2	161	<0.01	0.607
		PT 3	161	<0.01	0.426
2020	IPK 1	PT 1	176	<0.01	0.493
		PT 2	176	<0.01	0.322

Based on Table 6, the correlation test between GPA score in the first year with the 1st, 2nd, 3rd and 4th PT (phase 1) score has significant results because it has p <0.01. The correlation strength score in the class 2018 at the 1st PT (phase 1) has a weak correlation (r = 0.231, p <0.01), the 2nd PT (phase 1) is strong (r = 0.664, p <0.01), the 3rd PT (phase 1) is weak (r = 0.378, p<0.01) and the 4th PT (phase 1) is moderate (r = 0.490, p <0.01). In the class of 2019, the strength of the correlation is similar. PT (phase 1) to 1 was weak (r = 0.266, p<0.01), PT (phase 1) to 2 was strong (r = 0.607, p <0.01), and PT (phase 1) to 3 was moderate (r = 0.426, p<0.01). Whereas in the class of 2020, the correlation strength of PT (phase 1) to 1 was moderate (r = 0.493, p <0.01) and PT (phase 1) to 2 was weak (r = 0.322, p <0.01).

DISCUSSION

Based on the results of this descriptive study, which is seen by class in the 2018 and 2019 classes, the 1st PT (phase 1) has a lower average than the 2nd PT (phase 1). It is possible because during the 1st PT (phase 1), the students only took one semester, which contained only three blocks, so they only covered some of them in studying basic medical science. Research conducted at the University of Birmingham (UK) on the reasons students experience struggle in the first year of medical school is because the first year is a transitional period, and they have to adapt; for example, students experience culture shock when they go abroad for the first time and have to leave their comfort zone at home. In addition, students admit they have a hefty workload because they must adapt to become independent learners following the problem-based learning (PBL) curriculum goals. Some of them prefer to be taught rather than self-study. Because there is an adaptation period in the first year, it impacts student academic performance.10

The average PT (phase 1) to the second increases from the first PT (phase 1). It is possible because students have received basic medical science in full for almost three semesters, and the time of the second progress test is close to the completion of students to get the material, so the retention of knowledge is still good. The Malau-Aduli et al. (2013) study describes the retention of basic medical science students in the 2nd to 5th year, showing that the second and third-year students received the highest ranking.11 This indicates that in the early years, students still retain basic medical science relatively well.

In the class of 2018 and 2019, the average score of the 3rd PT (Phase 1) decreased compared to the 2nd PT (Phase 1). It is similar to Simaremare's (2020) study that the overall progress test scores of students in full will be higher according to the length of the student's study period. However, If it is based on the categories of basic medical and clinical questions, the final student will have more difficulty in the category of basic medical science.12 This is possible because the retention of students' knowledge regarding basic medical science decreases due to more exposure to clinical medical science. Some authors argue that there is too much teaching of basic medical sciences, so it is irrelevant and useless. The concepts presented need to be more detailed, and students must memorize them a lot. It has a negative impact on retention capacity and hinders students' preparation to study clinical sciences.13 However, this opinion is still being debated because students will realize the importance of basic sciences when a diagnostic dilemma occurs. If students are not taught about the basic sciences in detail, clinical reasoning will be minimal when finding cases at the professional level.13

In the 2018 and 2019 classes, the average PT (phase 1) score increased again. The spiral medicine curriculum approach encourages reflection, thinking, and using previous knowledge to develop new knowledge and skills. This situation becomes relevant in teaching basic medical science in a clinical context. The spiral medicine curriculum shows that students learn the basic sciences better when there is concurrent clinical exposure.13

On the other hand, the class of 2020 has PT scores (phase 1) and academic performance that are quite different from the 2018 and 2019 classes. The average results for the first PT (phase 1) score were higher than the second PT (phase 1). It is possible because the 2020 class has experienced online learning since the beginning of college due to the COVID-19 pandemic. Online learning has an impact on student academic performance. Interestingly, the average exam during the pandemic was significantly higher. A study comparing final grade exam scores before and during the pandemic shows higher averages for first-year students affected by the pandemic.14 This is to the results of our research that if the average academic achievement of the class of 2020 in the first year is not the lowest, namely 3.2723. According to Chang et al. (2022), the perception of first-year students at the University of California who have good academic performance is that online learning makes their time more flexible with their schedules, they can also balance between responsibilities at home and attending class, some students feel that online learning is more interactive and has proven to be an essential aspect of learning for medical students.14

According to Idris et al. (2021), a study in Brunei said that learning during the COVID-19 pandemic had positive and negative impacts. The positive impacts include students working more independently and trying to improve their abilities, students being able to adapt to online learning, which often changes suddenly, and students becoming more comfortable, flexible and organized.15 Although online learning has positive impacts, such as better academic performance, some drawbacks exist. According to Mortagy et al. (2022), a study in Egypt showed that there were many complaints from medical students studying during the COVID-19 pandemic, including lecturers who were not ready for online-based learning, internet problems both connection and speed, difficulty concentrating due to distraction at home, lack of student-lecturer communication and moderate levels of anxiety.16 Even though there are weaknesses in online learning, the academic performance results of basic medical science students in the class of 2020 are pretty good. However, the understanding or retention of knowledge while online needs further investigation. It can be seen when the 2nd PT (phase 1) score for the class of 2020 has decreased from the 1st PT (phase 1). According to Idris et al. (2021), the most

influential factor during online learning is that students need direct help to perform skills and laboratory skills. Hence, the lecturers must be more sure about students' learning performance. In addition, academics cannot control the correctness of student participation because it is carried out through online learning.15

The correlation test results in this study showed that academic performance, as seen from the GPA score, had a statistically significant relationship with the progress test score. The results of our study are similar to the study of Utami et al. (2017), which was conducted at the Muhammadiyah University Yogyakarta (UMY) dental professional program that there is a relationship between progress test scores and GPA scores.17 A similar study by Permata (2021), which discusses the correlation between formative scores and summative scores in oral exams in medical students at the University of Indonesia (UI), also shows a significant positive correlation.18 The results of this study are the results of our research that the summative assessment scores in the form of GPA scores have a relationship with formative assessments, which can be seen from the progress test scores. Summative assessments related to formative assessments show that students are still serious about working on questions with their abilities even though they are not at their maximum abilities, so this formative assessment can be relied upon to evaluate knowledge, especially basic medical science. Mastery of basic science, as reflected in the GPA in year one as a summative assessment, can equip students to solve questions related to basic science in the following years. It can be seen from the value of GPA 1, which correlates with all PT values (phase 1) from 1 to 4, even though there are fluctuations. This correlation is likely influenced by two things, namely time and spiral curriculum. First, time is seen from the closeness of the distance between the administration of basic medical materials and the PT exam. Second, the spiral curriculum allows students to repeat some basic medical content in the second year and beyond.

CONCLUSION

There is a correlation between academic performance and progress test scores in preclinical students at the medical faculty, Universitas Islam Indonesia.

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