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The Relationship among Nutritional Status, Motor Ability and Student Learning Achievements

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Abstract

This study was aimed at examining the relationship among nutritional status, motor skills, and students' learning achievements in Taekwondo subject. This research was conducted in Physical Education, Health, and Recreation Study Program of Pattimura University, Ambon 2019. The samples of the study were 51 students chosen by using total sampling technique. The instrument used for data collection on nutritional status of students was the Anthropometry Index (W/H). For motor skills, the Barrow Motor Ability test was used, while learning achievement data were taken from the 2018 odd semester test scores. The results of data analysis showed that there was a positive relationship between nutritional status and student achievement in Taekwondo subjects. There was a positive relationship between motor skills and students' achievements in Taekwondo subjects. There was a positive relationship between nutritional status and motor skills and students' achievements in Taekwondo subject. Therefore, the data can be used as the profile of the physical condition of students. Physical condition profile is a picture of the condition found in a person. For that reason, it is required to improve the student's learning achievement.

INTRODUCTION

The quality of academic services is closely related to student satisfaction (Martasubrata & Suwatno, 2016; Budiarti, Supriyanto, & Sunandar, 2018). Some of the most influential factors are reliability, responsiveness, assurance, empathy, and physical evidence (Rahareng & Relawan, 2017).

The implementation of national education at Pattimura University has implemented quality standards of education services and controls, which are outlined in academic regulations. Unpatti's student admission mechanism is improved by imposing a test of students' academic potential, because academic tests have a predictive validity on the student academic achievement (Permatasari, Prabandari, & Kristina, 2016). Therefore, all graduates are considered to have an adequate competence in sustaining the lecture process and are easily adapt with various academic demands.

Even though the students have passed the selection process, in reality, the students of the Unpatti Physical Education, Health, and Recreation Study Program are still experiencing problems with their learning achievements. As one of the quality of student education indicators, the student learning achievement has not shown optimal results. The passing grade of the Taekwondo course of the Physical Education, Health, and Recreation Study Program are still relatively low. The scores obtained are dominated by B and C. These conditions require students to attend remedial programs or short semester programs to improve their Taekwondo course grades.

Every lecturer needs to improve and optimize student learning outcomes, because lecturers are responsible for making effective and efficient learning approaches, methods, and strategies for improving student learning outcomes (Blegur, Wasak, & Manu, 2017). For example, conducting a research on learning achievement and learning process, as well as educational policies. The inhibiting factors must be diagnosed immediately so that the phenomenon of "remedial programs and short semesters" is no longer found as long as students attend the Taekwondo lectures.

Taekwondo courses are dominated by psychomotor aspects. To achieve an optimal learning achievement and to master various concepts of sports science in

practice, the students must have excellent physical conditions. Without the support of an excellent physical condition, students will have a difficulty in accepting the burden of practical lectures. However, in the reality, many students are not able to practice Taekwondo optimally in the learning process due to the high level of difficulty of the material. In addition, some students stop studying, leave the study, and move to other study programs. This condition gradually prevents the graduation standards in the Physical Education, Health, and Recreation Study Program from going forward.

The above phenomenon is also caused by the nutritional problems that lead to the reduce of endurance (Widiarista, Widajanti, & Zen, 2015) and learning difficulties (Indiawati, 2013). In daily life, the students only consume foods containing full carbohydrates, such as rice, sago flour, and corn, while foods containing other elements required by the body such as protein, fat, vitamins, and minerals are rarely consumed. Meanwhile, nutritional status is related to learning achievements (Sa'adah, Herman, & Sastri, 2014; Muchlis, Ernalina, & Firdaus, 2015; Rizki, Awaludin, & Tursinawati, 2017; El Hioui, Ahami, Aboussaleh, & Rusinek, 2016).

Besides nutrition, motor skills are needed in motion learning. Motor ability is a factor that influences learning achievements. In school level, motor skills have been shown to affect physical education learning outcomes (Asnaldi, Zulman, & Madri, 2018), dribbling learning outcomes (Siregar, Akhmad, & Sunarno, 2018), and sprint learning outcomes (Sobarna, 2017). In the Taekwondo sport itself, motor ability is needed to practice the explosive power of Dollyo Chagi Taekwondo kicks (Solissa, 2014). Motor ability is a supporting aspect for attending lectures. Motor skills require basic components of biomotor abilities, namely strength, endurance, speed, flexibility, and coordination. The biomotor ability component is the basis in shaping physical conditions so that students are able to get involved in the lecturing activities well.

Learning achievements can be expressed as the result of obtained changes (such as gaining a new knowledge, skill, and experience) during the learning process (Feralys, 2015). Learning achievement is a proof of student success in conducting their learning activities. Learning achievement is a word used to indicate a person's level of achievement in carrying out a

series of activities. Learning success or learning outcomes are measured through tests, which are then quantified in form of grades or Achievement Index (IP), hence learning achievement is strongly influenced by the students' readiness to learn (Mulyani, 2013).

Previous studies have reported different results about the correlation between nutritional status and sport performance. For example, nutritional status does not have a significant correlation with speed (Amin & Lestari, 2019), physical condition (Siregar & Sitompul, 2019), and fitness level (Permatasari, Adi, & Dewi, 2018). Meanwhile, other reports support the influence of nutritional status on the athlete stamina (Penggali & Huriyati, 2007). Special studies examining the relationship between nutritional status and physical fitness of Taekwondo athletes show significant results (Cornia & Adriani, 2018), but Cornia and Adriani's research had not answered the research need that was specifically aimed to test the effect of nutritional status on the student achievement in Taekwondo subject.

In line with the description of the previous problem, a scientific study of the nutritional status and motor skills of the students is needed to provide scientific solutions for learning achievement and to improve the quality of education at the Unpatti Physical Education, Health, and Recreation Study Program, Ambon.

METHODS

To achieve the stated research objectives, an appropriate research method was taken. The method used in this study was a quantitative method with a correlational design. While the independent variables in this study were the nutritional status (X1) and motor skills (X2), while the dependent variable was student achievement (Y).

The population of this study were all students of the Physical Education, Health, and Recreation Study Program, FKIP, Pattimura University, who were taking theoretical and practical Taekwondo courses. The number of samples taken were 51 students. The sampling technique used was the total sampling technique, hence this study could also be called as the population research.

The instrument used to retrieve student nutritional

status data was the Anthropometric Index (W/H). To gain motor ability data, the Barrow Motor Ability test was used. The learning achievement data were taken from the odd semester final test scores. The analysis technique used were a simple regression and a correlational technique or multiple correlations.

RESULT AND DISCUSSION

The relationship between the nutritional status and Taekwondo learning achievement was estimated by the equation $Y = 100,59 + 62,69 X_1$. This means that learning achievement was estimated by the regression equation of the nutritional status variable (X1) and Taekwondo learning achievement shown by the correlation coefficient $r_{y1} = 0,53$. The correlation coefficient had to be tested for its significance before the use to draw conclusions.

The relationship between motor skills and Taekwondo learning achievement was estimated by the equation $Y = 55,11 + 0,51 X_2$. This means that the learning achievement was estimated by the regression equation if the motor ability variable (X2) had been known. The relationship between motor skills (X2) and Taekwondo learning achievement (Y) was shown by the correlation coefficient $r_{y2} = 0,54$. The correlation coefficient had to be tested for its significance before the use to draw conclusions.

The relationship among the nutritional status (X1) and motor ability (X2) and Taekwondo learning achievement (Y) was expressed by the regression equation $Y = 92,05 - 20,15 X_1 + 0,94 X_2$. The relationship among the three variables had to be tested first for their significance before the use to draw conclusions. The results of the correlation coefficient test of research variables (partial or simultaneous) can be seen in the table 1. The contribution of the nutritional status variable on students' Taekwondo learning achievements was 28%, while 72% was a variance of other factors. The contribution of motor ability variables on students' Taekwondo learning achievements was 29%, while 71% was the variance of other factors. The contribution of nutrition status variables and motor skills on the students' Taekwondo learning achievement, was 21%, while 79% was the variance of other factors.

Table 1. Test results of the correlation coefficient X1 and Y, X2 and Y, and X1 and X2 and Y

Variable correlation	Correlation coefficient	T _{calculated}	t _{table}
Nutritional status › Learning achievement	0,53	4,36	1,67
Motor skills › Learning achievement	0,54	4,5	1,67
Nutritional status and motor skills › Learning achievement	0,46	23	3,19

Taekwondo lectures use a high physical activity, thus students need a balanced nutritional intake to avoid fatigue during activities. As a student of Physical Education, Health, and Recreation Study Program, physical activity is a routine activity, thus their physical intensity in a day is high. Especially when they are still in the early semester (1-5). With a stable physical condition, they can have good learning outcomes, because most of the measurements and assessments use "instrument" skills so that poor nutritional intake also affects poor performance.

Students can maintain and even improve their physical fitness by paying attention to nutritional status, because the nutritional status has a relationship with physical fitness (Penggali & Huriyati, 2007; Vania & Nugraheni, 2018). The results of comparative research have also provided evidences that nutritional status is influential, where Taekwondo athletes have a better strength profile and body composition than Wushu athletes, because the nutritional status of Taekwondo athletes is better than Wushu athletes (Sarkar, Debnath, Chatterjee, & Dey, 2018). Diets that meet nutritional balance play an important role for the students' maximum performance. A balanced diet program should contain (Rismayanthi, 2015) 60-70% carbohydrate, 10-15% protein, and 20-25% fat.

Individual nutritional needs are different based on the level of physical activity undertaken. However, nutritional status is certainly needed to maintain the stability of the body during activities. Nutritional status will be different for different age levels. For example, children have more nutritional needs than teenagers because of their physical activity and physical development (Daneshvar, et al., 2013). Nutritional status is the accumulation of various nutrition, hence it is necessary

for students to select various types of diets and nutrients to maintain the efficiency and physical effectiveness of students during activities (Wiweniuk & Wlodarek, 2013).

Nutritional status has a relationship with the pre-tension of learning. Previous research has provided evidences of the relationship between nutritional status and learning achievement, but it still focused on learning achievements in cognitive area (Rizki, Awaludin, & Tursinawati, 2017; Nadhifah, Yuniastuti, & Pukan, 2018). Meanwhile, this study limited the achievements on motor area. Therefore, the effect of nutritional status on the context of learning achievement is focused on the physical readiness of students to take part in various experiment during lectures, because the basis of the assessment of learning achievement is dominated by skills or physical "instruments". Thus, students must be able to maintain physical fitness through nutritional status in order to produce stable physical conditions for optimizing the achievement of learning.

Motor skills play an important role in physical learning (Siregar, Akhmad, & Sunarno, 2018). If a student's motor skills are low, the learning method used will provide insignificant results on learning outcomes (Rizali, 2007). Students need a variety of motor skills to carry out their movement assignments because the main instrument used in assessing learning outcomes is the students' skills in carrying out various techniques in Taekwondo sport correctly.

This study supports previous research conducted by Juniar, in which he proved that motor ability influences learning Taekwondo outcomes (Juniar, 2019). Students' achievements increase when they are supported by high motor skills. Although Juniar focused on Dolyo Chagi's learning outcomes, the results still contain characteristics of Taekwondo learning outcomes as kicks are inseparable of Taekwondo lectures. Other research from (Pahliwandari, Asmutiar, & Rajidin, 2018) also provides a support for motor skill learning outcomes.

Physical Education, Health, and Recreation Study Program students achieve their educational and self-development goals through physical media, hence motor skills are needed. Although some other studies providing evidences of the insignificance of motor

skills on learning outcomes (Sari & Indahwati, 2016), it does not mean that motor skills are not important. This insignificance is due to the use of learning outcome instruments in different school settings.

CONCLUSION

The results of data analysis showed that there was a positive relationship between nutritional status, motor ability and student learning achievements. High physical activity in lectures requires a balanced nutritional intake of the students, thus they can follow a variety of physical practices with a stable endurance. This study has emphasized that students should pay attention to their nutritional status and motor skills, while participating in learning skills. A good nutritional status would help them in maintaining physical stability, while motor skills are important for students when performing movements during the Taekwondo lecture. The aimed of this study was limited to find out two factors influencing student achievements in Taekwondo subjects. For this reason, a similar research can be carried out by involving other potential factors outside the nutritional status and motor skills. Nutritional status assessment tests as well as physical and motor skill tests should be administered during the admission of the new students. Therefore, the data can be used as the profile of the physical condition of students. Physical condition profile is a picture of the condition found in a person. For that reason, it is required to improve the student's learning achievement.

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