



The Influence of Nutritional Status, Physical Fitness, and Learning Motivation on Learning Outcomes in Physical Education, Sport and Health

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Abstract

The aim of the study was to see the effect of nutritional status, physical fitness, and learning motivation on PJOK learning outcomes. This type of research is path analysis. The research population is students of SMPN 1 Tungkal Ulu. Sampling used purposive sampling, with a total of 30 female students. The research instrument used the Body Mass Index test, the Fitness Test for Indonesian Students, the Likert Questionnaire, and the results of the PJOK report cards. The results showed that: (1) There is a direct influence of nutritional status on students' PJOK learning outcomes (2) There is a direct influence of physical fitness on students' PJOK learning outcomes (3) There is a direct influence of learning motivation on students' PJOK learning outcomes (4) There is an indirect influence of nutritional status on students' results learning PJOK through students' learning motivation (5) There is an indirect influence of physical fitness on PJOK learning outcomes through students' learning motivation (6) There is an indirect influence of nutritional status on PJOK learning outcomes through students' physical fitness.

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INTRODUCTION

Sports and health physical education is a comprehensive learning process that is carried out to develop and improve the psychomotor aspects of students through physical activity. (Sandford, 2006). Sports and Health Physical Education is basically a learning process through physical activity which is used as a medium to achieve overall individual development in improving physical fitness and movement skills possessed by students and this is related to the goals of physical education and sport itself (Kondri et al., 2010).

At the present time, the independent curriculum is a new breakthrough to improve students' soft skills (Subagyo, 2546). The Merdeka Curriculum uses a combination of intracurricular (70-80% from JP) and co-curricular (20-30% JP) learning through a project to strengthen the Pancasila Student Profile, (Suryaman 2020). Learning with the Independent Curriculum gives students the freedom to choose the subjects that best suit their talents, interests and abilities. In addition, this curriculum also gives freedom to teachers in choosing teaching tools according to the learning needs and interests of students.

The learning outcomes are in the form of an overview of the extent to which students can understand the material that has been implemented by the teacher (Rodríguez-Lorenzo et al., 2016). Learning outcomes are output values in the form of numbers and descriptions obtained by students after participating in learning activities, (Lundvall & Meckbach, 2008) . The teaching and learning process is guided by a predetermined curriculum (Wijayanti & Wibowo, 2017). To improve PJOK learning outcomes, students must have good nutrition.

Nutritional status is the state of the body as a result of food consumption and use of nutrients, (Syed-Abdul et al., 2018). Nutritional status can also be interpreted as a physical sign caused by a balance between nutritional intake and expenditure through certain variables, namely nutritional status indicators. In learning sports and health physical education, nutritional status is very concerned to see the state of the student's body (Cantarero et al., 2018).

In addition, students must also have good physical fitness. Physical fitness is a person's ability to carry out daily tasks with full sincerity and responsibility, without feeling tired in an enthusiastic way to enjoy the use of free time and face the possibility of various unexpected dangers, (Donie, 2020). Physical fitness is a person's ability to carry out daily tasks without experiencing significant fatigue and still have energy reserves to carry out these activities. Motivation to learn is the overall driving force within students that gives rise to learning activities or learning processes that provide continuity and direction to learning activities so that the goals desired by the learning subject can be properly achieved.

The student achievement at SMP Negeri 1 Tungkal Ulu should have increased. To improve student achievement, professional teachers are needed. Professional teachers are people who have special skills and abilities in the field of teacher training so that teachers are able to carry out their duties and functions as teachers with maximum abilities. One way to become a professional or qualified teacher is to have an educator certificate, teacher certification, and attend various seminars or upgrades to the implementation of professional teachers.

Professional teachers must have a Learning Implementation Plan (RPP). Learning Implementation Plans (RPP) are

face-to-face learning activity plans for one or more meetings. RPP was developed in the syllabus to direct students' learning activities in an effort to achieve basic competence (KD). A teacher is obliged to compile a complete and systematic lesson plan. Teachers must design their own Learning Implementation Plan following the indicators and Basic Competencies that have been determined.

In addition, adequate infrastructure can also improve student achievement in the learning process. Infrastructure is defined as a tool to achieve educational goals, for example books, bags, pens, computers, and many others. While the notion of infrastructure is everything that is the main support for the implementation of a process. Schools that have adequate infrastructure will produce the best students. To achieve success in learning physical education and sports, students need a balanced nutritional intake, the nutritional intake of students is the responsibility of parents and schools. Parents should equip their children before going to school or other activities with nutritious food. Consumption of good nutrition in students can support growth and development, not only physical growth, but also the growth of brain cells, the development of intelligence and so on. So that by fulfilling the nutritional needs of each individual student it is hoped that it can support the learning outcomes he gets.

Motivation is also very important to improve student achievement. Intrinsic and extrinsic motivation is needed by students. If motivation is down, students will be lazy in the learning process. Therefore, it requires attention to motivation from oneself, namely desire, willingness, seriousness, tenacity, curiosity, and motivation from outside oneself, for example motivation from parents, teachers, and friends to support

student learning achievements. Based on the results of observations while teaching at SMP Negeri 1 Tungkal Ulu there are still many students who get low learning outcomes. KKM only. So that only a small proportion of students at SMP Negeri 1 Tungkal Ulu get grades that exceed the KKM and meet the standards set by the school. There are two assessments in the PJOK subject, namely the assessment of knowledge and skills. The two assessments also play an important role in the learning outcomes of PJOK subjects.

The final results of the assessment of knowledge and skills in the 2022/2023 academic year in Semester I, In class VII.1, out of 24 students, 16 students received a complete score and 8 students received an incomplete score. In class VII.2, out of 26 students, 17 students received a complete score and 9 students received an incomplete score. In class VII.3 out of 20 students, only 13 students got a complete score and 7 people got an incomplete score. Furthermore, in the 2022/2023 academic year in Semester II, in class VII.1 out of 24 students, only 15 students got a complete score and 9 people got an incomplete score. In class VII.2 out of 26 students 16 people got a complete score and 8 people got an incomplete score. Then in class VII.3 out of 20 students only 12 people got a complete score and 8 people got an incomplete score. These data show that the PJOK learning outcomes of students at SMP Negeri 1 Tungkal Ulu are still relatively low. So this is what causes the average student score to be low overall.

METHOD

This type of research is path analysis. The research population is students of SMPN 1 Tungkal Ulu. Sampling used purposive sampling, with a total of 30 female students. The research

instrument used the Body Mass Index test, the Fitness Test for Indonesian Students, the Likert Questionnaire, and the results of the PJOK report cards.

Sample

In this study, the population and sample in this study were 244 students at SMP Negeri 1 Tungal Ulu.

Sampling Procedure

The sampling technique used purposive sampling technique. According to (Sugiyono, 2017) purposive sampling is a sampling technique with certain considerations. The sample in this study used class VII students by taking only female samples with a total of 30 students.

Materials and Equipment

The dependent variable in this study uses learning outcomes as seen from the results of the Minimum Completeness Criteria (KKM) and the results of report cards for sports and health physical education subjects (PJOK). Independent variables The nutritional status test instrument uses the Body Mass Index (BMI) test, according to (Gusril 2017, 124), the physical fitness test instrument uses the Indonesian Student Fitness Test (TKSI), (Kemendikbud, 2021), and the instruments used in this study using a learning motivation questionnaire. Questionnaire using a Likert scale.

Design or Data Analysis

The data analysis technique used in submitting the hypothesis is Path Analysis. Data analysis includes: 1) data description, 2) analysis requirements test which consists of: data normality test and linearity test, 3) path analysis which includes: model testing and hypothesis testing.

RESULTS

Research Description

In this section the author will present a description of the data which is the result of tests and measurements of all research samples. The research data consisted of PJOK Learning Outcomes (Y) as the dependent variable (endogenous), then Nutritional Status (X_1), Physical Fitness (X_2), as independent (exogenous) variables, and Learning Motivation (X_3) as an intermediary variable (Intervening). For a more detailed description of the state of each data in the group, it can be seen in the description that the researcher will describe as follows.

1. Learning Outcomes (Y)

The description of the data shows the frequency of PJOK learning outcomes, the overall score is above the KKM, but there are still 2 participants who are in the sufficient category. PJOK subjects have an important role in supporting the physical health and skills development of students. Adequate score in PJOK indicates adequate achievement, but still needs improvement. By participating actively, consistently practicing, and establishing teamwork, students can improve their achievement in this subject.

2. Nutritional Status (X_1)

The description of the data shows that the results of the frequency of nutritional status are only 8 out of 30 students who are in the normal category. Good nutritional status is important to support the growth and development of students. The challenges of dealing with these limitations are real, but with the

availability of healthy food, and cooperation with external parties, we can overcome these problems. With the joint efforts of schools, parents and the community, we can create an environment that supports the health and well-being of students.

3. Physical Fitness (X2)

The results of the description of the data show that no students have very good physical fitness, this is because students pay attention to body fitness by maintaining a 4 healthy 5 perfect diet, parents pay attention to students' physical fitness, and a healthy surrounding environment. Physical fitness is very good because students maintain a healthy lifestyle. Parents pay attention to the health of students so that students can maintain physical fitness very well.

4. Learning Motivation (X3)

From the conclusions above, it is still found that students' learning motivation is not in the very least category, this matter must be a concern for educators and must be followed up so that in the future students are no longer lazy and students can have very good learning motivation from both internal and external. Learners need to identify personal goals and seek interest in the subject matter. Getting support from teachers, family, and friends is also important. Don't hesitate to ask for help when you need it. Setting a regular study schedule and creating a fun learning environment will also help. By facing these challenges with enthusiasm, students can overcome their lack of motivation to

learn and reach their full potential at school.

Data Analysis Requirements Testing

Before testing the hypothesis, the data analysis requirements are first tested. The analysis requirements test includes data normality testing and data linearity testing. Therefore, the following presents the results of the normality and linearity tests performed.

1. Normality test

The normality test used in this study is the Kolmogorov-Smirnov normality test with two versions, based on residual values and the normality test based on each variable with the help of the SPSS version 25 program.

Based on the results of normality test calculations using the Shapiro-Wilk test, the probability values of all variables are > 0.05 . Thus it can be concluded that all data groups in the study are normally distributed.

2. Linearity Test

The linearity test aims to see whether each data from the variables nutritional status (X1), physical fitness (X2), and learning motivation (X3) tends to form a linear (straight) line towards PJOK learning outcomes (Y). The test criteria are if the Sig value $> \alpha = 0.05$ then the data is said to be linear, otherwise the data is not linear. Based on statistical analysis, all data groups are linear

Hypothesis testing

Testing this hypothesis will be carried out using a path analysis approach using the SPSS version 25 program, the output of the variables is

nutritional status (X_1), physical fitness (X_2), learning motivation (X_3), and learning outcomes PJOK (Y). Based on hypothesis testing with the SPSS 25 application, the empirical causal models X_1 , X_2 , X_3 , with Y, are visualized as follows:

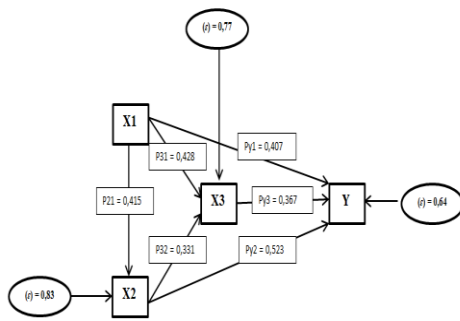


Figure 1. Empirical causal models X_1 , X_2 , X_3 , with Y

1. The Direct Effect of Nutritional Status on Students' PJOK Learning Outcomes at SMP Negeri 1 Tungal Ulu

Individual tests carried out X_1 against Y obtained the path coefficient $P_{y1} = 0.407$ and $p\text{-value} = 0.014 < 0.05$, or H_0 was rejected, so there was a direct effect of the nutritional status variable (X_1) on PJOK learning outcomes (Y). Thus the hypothesis is accepted. The magnitude of the direct influence of nutritional status on PJOK learning outcomes is as follows.

$$\begin{aligned} \text{Effect of } P_{yx1} &= \rho_{yx1}^2 \times 100 \% \\ &= 0.407^2 \times 100 \% \\ &= 16.56 \% \end{aligned}$$

The effect of nutritional status on PJOK learning outcomes is 16.56%. So that the remaining 83.44 is influenced by other factors.

2. The Direct Effect of Physical Fitness on Students' PJOK Learning Outcomes at SMP Negeri 1 Tungal Ulu

Individual tests carried out X_2 on Y found that the path coefficient results $P_{y2} = 0.523$ and $p\text{-value} = 0.001 < 0.05$, or H_0 is rejected, so there is a direct effect of the physical fitness variable (X_2) on PJOK learning outcomes (Y). Thus the hypothesis is accepted. The magnitude of the direct influence of physical fitness on PJOK learning outcomes is as follows.

$$\begin{aligned} \text{Effect of } P_{yx2} &= \rho_{yx2}^2 \times 100 \% \\ &= 0.523^2 \times 100 \% \\ &= 27.35 \% \end{aligned}$$

The effect of physical fitness on PJOK learning outcomes is 27.35%. While the remaining 72.65% is influenced by other factors.

3. The Direct Effect of Learning Motivation on Students' PJOK Learning Outcomes at SMP Negeri 1 Tungal Ulu

Individual tests carried out X_3 against Y found that the path coefficient results $P_{y3} = 0.304$ and $p\text{-value} = 0.025 < 0.05$, or H_0 was rejected, so there is a direct effect of learning motivation variable (X_3) on learning outcomes PJOK(Y). Thus the hypothesis is accepted. The magnitude of the direct influence of learning motivation on PJOK learning outcomes is as follows.

$$\begin{aligned} \text{Effect of } P_{yx3} &= \rho_{yx3}^2 \times 100 \% \\ &= 0.304^2 \times 100 \% \\ &= 9.24 \% \end{aligned}$$

The effect of learning motivation on PJOK learning outcomes is 9.24%. While the remaining 90.76% is influenced by other factors.

4. The Indirect Effect of Nutritional Status on PJOK Learning Outcomes Through Students' Learning Motivation at SMP Negeri 1 Tungal Ulu

Based on the results of analysis tests on nutritional status variables on PJOK Learning Outcomes through learning motivation. Based on the calculation results above, it is known that the direct effect of P_{y1} is 0.407 and the indirect effect is 0.157, which means that the value of the indirect effect is smaller than the value of the direct effect ($0.157 < 0.407$). These results indicate that, indirectly X_1 through X_3 have a significant influence on Y. The magnitude of the indirect effect of nutritional status on PJOK Learning Outcomes through learning motivation is 0.564 or by 31.9%. While the remaining 68.1% is influenced by other factors. Then the hypothesis is accepted.

5. The Indirect Effect of Physical Fitness on PJOK Learning Outcomes Through Student Learning Motivation at SMP Negeri 1 Tungkal Ulu

Based on the results of analysis tests on physical fitness variables on PJOK Learning Outcomes through learning motivation. Based on the calculation results above, it is known that the direct effect of P_{y2} is 0.523 and the indirect effect is 0.121, which means that the value of the indirect effect is smaller than the value of the direct effect ($0.121 < 0.523$). These results indicate that, indirectly X_2 through X_3 has a significant influence on Y. The magnitude of the indirect effect of physical fitness on PJOK Learning Outcomes through learning motivation is 0.644 or by 41.5%. While the remaining 58.5% is influenced by other factors. Then the hypothesis is accepted.

6. The Indirect Effect of Nutritional Status on PJOK Learning Outcomes through the Physical Fitness of

Students at SMP Negeri 1 Tungkal Ulu.

Based on the results of analysis tests on nutritional status variables on PJOK learning outcomes through physical fitness students. Based on the calculation results above, it is known that the direct effect P_{y1} is 0.407 and the indirect effect is 0.217, which means that the value of the indirect effect is smaller than the value of the direct effect ($0.217 < 0.407$). These results indicate that, indirectly X_1 through X_2 has a significant influence on Y. The magnitude of the indirect effect of nutritional status on PJOK Learning Outcomes through physical fitness is 0.624 or by 24.3%. While the remaining 75.7% is influenced by other factors. Then the hypothesis is accepted.

DISCUSSION

1. The Direct Effect of Nutritional Status on Students' PJOK Learning Outcomes at SMP Negeri 1 Tungkal Ulu

Nutritional status refers to the condition of a person's body which is influenced by food intake and nutrition received and its impact on growth and health (Romadhoni et al., 2020). Referring to this statement, students must maintain good nutrition to improve learning outcomes, by maintaining a healthy diet, lifestyle and environment. Diet is the way a person or group of people chooses food and consumes it as a physiological, psychological, cultural and social reaction. This eating pattern is also called a food pattern or eating habits. Diet is the behavior of human groups in meeting the need for food including attitudes, beliefs, and selection of food ingredients. Balanced eating activities include setting the adequate amount of food, type of food and eating schedule, in its function to

maintain health . Based on the results of research that has been analyzed using the SPSS 25 program, it is obtained that $\text{sig} = 0.014 < 0.05$, so in this case H_0 rejected and H_a accepted , which means the coefficient of path analysis of nutritional status has a positive direct effect on PJOK learning outcomes . The percentage of direct effect of nutritional status on PJOK learning outcomes is 16.56%. So that the remaining 83.44 is influenced by other factors. The results of this study are relevant to (Reo et al., 2019) that nutritional status is an important indicator in assessing the health and physical development of students.

The nutritional status of students has a direct influence on PJOK learning outcomes. Students with good nutritional status tend to have better physical endurance, concentration, and motor skills, as well as high motivation and enthusiasm for learning (TH Sin & Ruslin, 2018) . Attention to student nutrition must be a major concern in efforts to improve PJOK learning outcomes. By maintaining the nutritional status of students, it is hoped that they can achieve optimal physical and cognitive potential in PJOK learning.

The nutritional status of students has an important role in determining their learning outcomes. Good nutritional status will contribute to increased concentration, cognitive abilities, and memory, which will ultimately help students achieve better learning outcomes. On the other hand, poor nutritional status can cause various problems that have a negative impact on academic achievement. Adequate nutritional status, including balanced and sufficient nutritional intake, will help improve students' concentration and memory. Adequate nutrition will provide the energy needed to focus and participate in learning activities. With good concentration, students can more easily understand the subject matter and

remember the information they have learned.

Physical Health and Poor nutritional status can cause health problems, such as iron deficiency which can cause anemia, or vitamin D deficiency which can interfere with bone growth (Konselor et al., 2021). These health problems can cause students to be absent from school, which in turn affects their opportunities to learn (Wijayanti & Wibowo, 2017). Poor attendance can cause them to miss subject matter and affect their learning outcomes.

Therefore, it is important for educators and parents to ensure students get a balanced and adequate nutritional intake. Improving the nutritional status of students will help improve their learning outcomes and create a more optimal learning environment. Family and school support in providing education about healthy eating patterns and providing nutritious food is the key to achieving good academic achievement.

2. The Direct Effect of Physical Fitness on Students' PJOK Learning Outcomes at SMP Negeri 1 Tungkul Ulu

Physical fitness is very important in supporting all activities in daily life, but everyone has different physical fitness (MacCann et al., 2019). Physical fitness is very useful for students in emulating PJOK learning which really involves a lot of physical activity in the process (Utamayasa, 2021). Physical fitness will increase if the exercise is carried out correctly and regularly in accordance with the condition of a person's body when carrying out various physical activities related to sports.

One of the goals of PJOK learning is to improve the physical fitness of students. When students already have good physical fitness, it will be very supportive to be able to follow the learning process and be able to take part in learning to the fullest

without fatigue. So that this situation will be able to increase the willingness of students to learn and can get good PJOK learning outcomes as well (Rojali et al., 2021). Findings show that the results of calculations carried out using the SPSS 25 program obtained $\text{sig} = 0.001 < 0.05$, so in this case H_0 was rejected and H_a was accepted which means the coefficient of path analysis of physical fitness has a positive direct effect on PJOK learning outcomes. The percentage of direct effect of physical fitness on PJOK learning outcomes is 27.35%. While the remaining 72.65% is influenced by other factors. The results of this study are relevant to the statements that have been described.

PJOK aims to develop students' physical potential and motor skills, as well as increase understanding of the importance of health and fitness. In the implementation of PJOK learning, the physical fitness factor of students plays a crucial role in achieving optimal learning outcomes, the physical fitness of students has a direct influence on PJOK learning outcomes (Tjung, 2016). Good physical fitness can increase physical endurance, concentration, motor skills, mental health, and student motivation in PJOK learning. Therefore, efforts to improve students' physical fitness must be a major concern in a holistic PJOK learning approach. By having students who are physically fit and eager to participate, PJOK learning can be a positive experience and have an impact on students' physical and cognitive development.

3. The Direct Effect of Learning Motivation on PJOK Learning Outcomes of Students of SMP Negeri 1 Tungkal Ulu

Learning motivation is one aspect that also determines effectiveness in learning (Dharma Utamayasa, 2021). Students will study well if there is a driving factor, namely learning

motivation. Students will study seriously if they have high learning motivation. Learning motivation is all the driving force that exists within students who are able to give the desire to learn to touch the goals of learning (Utamayasa, 2021). The purpose of learning is to get good learning outcomes, so that if students have good motivation in learning then they will be able to get better grades or learning outcomes as well.

Students who are motivated in learning will continue to work even if the teacher leaves the class inside or outside the class, does additional assignments, doesn't want to waste time, actively does school work outside of class hours and looks for activities related to learning. The decreased motivation to learn in students will cause individuals to be less enthusiastic about participating in the learning process (Son, 2017). Mood and concentration are important components needed for learning activity, interest, and motivation in students (Putra et al., 2022). Students who are lazy to learn will affect learning motivation and learning achievement. Based on the results of calculations carried out using the SPSS 25 program, the value of $\text{sig} = 0.025 < 0.05$ is obtained, so in this case H_0 is accepted and H_a is rejected, which means that the coefficient of path analysis of learning motivation has a positive direct effect on PJOK learning outcomes. The percentage of direct influence of learning motivation on PJOK learning outcomes is 9.24%. While the remaining 97.54% is influenced by other factors.

Learning motivation has a positive direct influence on PJOK learning outcomes. High learning motivation will increase the participation and involvement of students in PJOK learning, increase their concentration and physical endurance, and increase their confidence in physical activities. By creating a learning environment that supports

students' learning motivation, teachers can improve PJOK learning outcomes and develop students' awareness of the importance of an active and healthy life for their physical and mental well-being. To create strong learning motivation, the teacher must be able to choose a learning model that is appropriate to the material presented and the abilities of each student (UMI, 2020). Through the right strategy the participants will be motivated and enthusiastic in learning. The higher the learning motivation of students (Zunidar, 2022). Students who are highly motivated in learning will probably get high learning outcomes too, meaning that the higher the motivation, the more intensity of effort and effort made, the higher the learning outcomes they get. Students make various efforts or efforts to increase success in learning so as to achieve satisfactory success as expected. In addition, motivation also supports efforts and keeps the learning process of students running. This makes students persistent in learning.

4. Indirect Effect of Nutritional Status on PJOK Learning Outcomes through Learning Motivation Students of SMP Negeri 1 Tungal Ulu

The nutritional status of students can affect PJOK learning outcomes through students' learning motivation (Dharma Utamayasa, 2021). Students with good nutritional status tend to have better physical and mental health, higher concentration and focus, and stronger learning motivation (Izzatunnisa et al., 2021). Therefore, it is important to pay attention to the health and nutrition of students in order to create a learning environment that supports optimal learning motivation in PJOK (Gusril et al., 2021). Therefore, students will more actively participate in physical activities and achieve better learning outcomes in PJOK subjects.

Based on data analysis, it is known that the direct effect P_{y1} is 0.407 and the indirect effect is 0.157, which means that the value of the indirect effect is smaller than the value of the direct effect ($0.157 < 0.407$). These results indicate that, indirectly X_1 through X_3 has a significant influence on Y . The percentage of indirect influence of nutritional status on PJOK Learning Outcomes through learning motivation is 0.564 or by 31.9%. While the remaining 68.1% is influenced by other factors. Then the hypothesis is accepted.

Nutritional status reflects the health and nutritional conditions of students which are influenced by adequate and balanced food intake (Gusril et al., 2021). Students with good nutritional status tend to have better physical endurance, higher concentration, and stronger learning motivation. In the context of PJOK, nutritional status can have an indirect impact on learning outcomes through participants' learning motivation. Good nutritional status contributes to optimal health and physical condition (Khairroh et al., 2021). Students with adequate nutritional status tend to have better physical endurance, so they can participate more actively in physical activities in PJOK. A sense of good health also has an impact on enthusiasm for learning and the desire to participate in learning. When students feel fit and healthy, they are more motivated to take part in PJOK lessons with enthusiasm and try to achieve better results. Learning motivation is a key factor that influences PJOK learning outcomes. Students who have high learning motivation tend to be more enthusiastic in seeking knowledge, trying new things, and trying to achieve higher learning achievements. Strong learning motivation will have a positive impact on the participation and involvement of students in physical activities, so that they are more active and

enthusiastic in participating in PJOK lessons.

5. Indirect Effect of Physical Fitness on PJOK Learning Outcomes through Learning Motivation Students of SMP Negeri 1 Tungal Ulu

Good physical fitness also has a positive impact on students' enthusiasm for learning. Students who feel fit and healthy will be more motivated to participate actively in physical activities and try to achieve higher achievements in PJOK (Gusril et al., 2021). High enthusiasm for learning will have a positive impact on the participation and involvement of students in learning, so that they will be more active and enthusiastic in participating in PJOK lessons.

Based on data analysis, it is known that P_{y2} is 0.523 and the indirect effect is 0.121, which means that the value of the indirect effect is smaller than the value of the direct effect ($0.121 < 0.523$). These results indicate that, indirectly X_2 through X_3 has a significant influence on Y . Percentage of indirect effect of physical fitness on PJOK Learning Outcomes through learning motivation is 0.644 or by 41.5%. While the remaining 58.5% is influenced by other factors. Then the hypothesis is accepted.

Physical fitness has an indirect effect on PJOK learning outcomes through students' learning motivation. Good physical fitness contributes to the health, self-confidence and independence of students. In addition, physical fitness also has a positive impact on the focus, concentration, and enthusiasm for learning of students. By creating a learning environment that supports optimal learning motivation in PJOK, students will more actively participate in physical activities and achieve better learning outcomes in PJOK subjects.

6. The indirect effect of nutritional status on PJOK learning outcomes through physical fitness Students of SMP Negeri 1 Tungal Ulu

Nutritional status and physical fitness have a close relationship. Students with poor nutritional status or malnutrition tend to experience a decrease in physical fitness (Jihad & Annas, 2021). Malnutrition can cause fatigue, decreased physical endurance, and impaired muscle growth. Conversely, students with good nutritional status tend to have better physical fitness (Agustina, 2016: 216). Students have sufficient energy levels, better physical endurance, and more optimal motor skills. Therefore, good nutritional status is very important in achieving optimal physical fitness, which in turn has a positive impact on learning outcomes in PJOK.

Based on data analysis, it is known that the direct effect P_{y1} is 0.407 and the indirect effect is 0.217, which means that the value of the indirect effect is smaller than the value of the direct effect ($0.217 < 0.407$). These results indicate that, indirectly X_1 through X_2 has a significant effect on Y . The percentage of indirect effect of nutritional status on PJOK Learning Outcomes through physical fitness is 0.624 or by 24.3%. While the remaining 75.7% is influenced by other factors. Then the hypothesis is accepted.

Nutritional status has a significant indirect effect on learning outcomes in PJOK subjects through physical fitness. Students with good nutritional status tend to have better physical fitness, which has an impact on physical endurance, involvement in physical activity, focus and concentration, independence, and learning motivation. Therefore, it is important to improve the nutritional status and physical fitness of students in order to create a learning environment that supports optimal learning outcomes in PJOK subjects. With the participation of

all parties, such as schools, teachers, parents and students themselves, we can achieve this goal and provide PJOK education that is better and beneficial for the physical and mental development of students.

CONCLUSION

From the results of the study it can be concluded that the research is as follows :

1. $P_{y1} = 0.407$ and $p\text{-value} = 0.014 < 0.05$, or H_0 is rejected, so there is a direct effect of the nutritional status variable (X_1) on PJOK learning outcomes (Y). Thus the hypothesis is accepted. The effect of nutritional status on PJOK learning outcomes is 16.56%. So that the remaining 83.44% is influenced by other factors.
2. $P_{y2} = 0.523$ and $p\text{-value} = 0.001 < 0.05$, or H_0 is rejected, so there is a direct effect of the physical fitness variable (X_2) on PJOK learning outcomes (Y). Thus the hypothesis is accepted. The effect of physical fitness on PJOK learning outcomes is 27.35%. While the remaining 72.65% is influenced by other factors.
3. $P_{y3} = 0.304$ and $p\text{-value} = 0.025 < 0.05$, or H_0 is rejected, so there is a direct effect of learning motivation variable (X_3) on learning outcomes PJOK(Y). Thus the hypothesis is accepted. The effect of learning motivation on PJOK learning outcomes is 9.24%. While the remaining 97.54% is influenced by other factors.
4. Based on the calculation results above, it is known that the direct effect of P_{y1} is 0.407 and the indirect effect is 0.157, which means that the value of the indirect effect is smaller than the value of

the direct effect ($0.157 < 0.407$) . These results indicate that, indirectly X_1 through X_3 have a significant influence on Y. The magnitude of the indirect effect of nutritional status on PJOK Learning Outcomes through learning motivation is 0.564 or by 31.9%. While the remaining 68.1% is influenced by other factors. Then the hypothesis is accepted .

5. Based on the calculation results above, it is known that the direct effect of P_{y2} is 0.523 and the indirect effect is 0.121, which means that the value of the indirect effect is smaller than the value of the direct effect ($0.121 < 0.523$) . These results indicate that, indirectly X_2 through X_3 has a significant influence on Y. The magnitude of the indirect effect of physical fitness on PJOK Learning Outcomes through learning motivation is 0.644 or by 41.5%. While the remaining 58.5% is influenced by other factors. Then the hypothesis is accepted .
6. Based on the calculation results above, it is known that the direct effect P_{y1} is 0.407 and the indirect effect is 0.217, which means that the value of the indirect effect is smaller than the value of the direct effect ($0.217 < 0.407$) . These results indicate that, indirectly X_1 through X_2 has a significant influence on Y. The magnitude of the indirect effect of nutritional status on PJOK Learning Outcomes through physical fitness is 0.624 or by 24.3%. While the remaining 75.7% is influenced by other factors. Then the hypothesis is accepted.

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