

The Effect Of The Vital Capacity Of The Lungs, Nutrition Status, Physical Activity And Sport Motivation Towards Physical Fitness For Male Students At Secondaryschools In Indonesia

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Article Info	Abstract
<p data-bbox="199 504 368 530">Article History</p> <p data-bbox="199 562 360 622">Received: April 05, 2021</p> <p data-bbox="199 654 360 714">Accepted: May 27, 2021</p> <hr/> <p data-bbox="199 745 328 772">Keywords :</p> <p data-bbox="199 777 432 927">Vital Lung Capacity, Nutritional Status, Physical Activity, Exercise Motivation, And Physical Fitness</p> <p data-bbox="199 992 475 1052">DOI: 10.5281/zenodo.4826951</p>	<p data-bbox="560 504 1401 1108"><i>This study aims to explore the vital capacity of the lungs, nutrition status, and physical activity and exercise motivation on physical fitness for students of Junior High School 1 Baranti, Sidrap regency, Indonesia in 2018 academic year. There were 30 males as participants of the study. This study used survey methods to see the influence among variables. Data analysis techniques use was path analysis. Path analysis technique was used to examine the direct and indirect effects on lung vital capacity, nutritional status, physical activity, and exercise motivation on physical fitness for students of Junior High School 1, BarantiSidrap regency. Path analysis techniques with the aid of SPSS version 20.00 at the significance level $\alpha = 0.05$. The results of this study are as follows: (1) Vital lung capacity directly affects physical fitness, (2) Nutritional status has a direct effect on physical fitness; (3) Physical activity directly affects physical fitness; (4) Exercise motivation directly affects physical fitness; (5) Vital lung capacity has a direct effect on exercise motivation; (6) Nutritional status directly affects the motivation to exercise; (7) Physical activity directly affects the motivation to exercise; (8) Vital lung capaciously has a direct effect on physical fitness; (9) Nutritional status through exercise motivation simultaneously has a direct effect on physical fitness; and (10) Physical activity through exercise motivation simultaneously influences physical fitness</i></p>

Introduction

Life in the modernization era is full of challenges, including threats to the quality of life related to human health. People in developed countries are already feeling the consequences of a lifestyle of more silence, less movement and excess calories as a result of automation and excess calories. Sooner or later, it is felt that the Indonesian people have started to live a silent lifestyle, especially among the middle and upper classes. The effect that he feels is an increase in hypokinetic disease (lack of movement), the direct result is low ability and high levels of illness which of course also have an impact on one's physical fitness. Hypokinetic Diseases or Conditions Hypo-means "under" or "too little" and -kinetic means "movement" or "activity." Thus, hypokinetic means "too little activity." A hypokinetic disease or condition is associated with lack of physical activity or too little regular exercise. Examples include heart disease, low back pain, and Type II diabetes (Corbin, et al., 2008).

Hypokinetic diseases are those conditions that occur as a result of lack of exercise and movement. Examples of hypokinetic diseases are obesity, diabetes, stroke, and heart disease. Those individuals that don't exercise are at greater risk of these conditions (Study.Com, 2021). Hypo-kinetic diseases cause adverse health issues like cardiovascular disease and type 2diabetes which are highly linked to increased rates of morbidity and mortality (Student Share, 2021). Cardinal (2016) argues that physical activity is unquestionably good for health. It is also good for the human spirit. It allows people to partake in life and to experience the joys and fullness of life. Cardinal therefore adds that an increased recognition that there are factors affecting physical activity behavior that reside beyond an individual's personal control, in the 21st century a greater emphasis has been placed on the social ecological factors that may influence an individual's physical activity behavior.

The impact of modernization that all uses technology limits humans from physical activities in the form of games and sports, so that the level of physical fitness is not in accordance with the load of daily activities, including body loads that cause laziness to move. World Health Organization (2021) defines physical activity as any bodily movement produced by skeletal muscles that requires energy expenditure. Physical activity refers to all movement including during leisure time, for transport to get to and from places, or as part of a person's work. Both moderate- and vigorous-intensity physical activity improve health. WHO therefore reveals that Popular ways to be active include walking, cycling, wheeling, sports, active recreation and play, and can be done at any level of skill and for enjoyment by everybody. Through regular physical activity, adequate movement and function of body organs will be obtained for the development of better physical and joint abilities.

One of the right places to overcome the impact that will occur on a series of problems in the future is through sports activities. Sports activities are endless activities, it can even be said that sports are already a part of human life activities. Sport is a necessity of human life. By exercising, especially sports related to health, it will be able to maintain and increase the degree of human life. Without exercise, there will be a decline in health and increase the likelihood of contracting non-infectious diseases. that indifferent of the sport that is practiced, leisure sport activities contributes in fulfilling the adult necessities and is an important way of maintain physical, social and psychological progress. An important aim of Physical Education and Sports is to contribute to individual personality development (Pomohaci&Sopa, 2018).

A healthy human being is a resource needed in development. Therefore, sports need to be more socialized and improved as a way of physical and spiritual development for every member of society". Then also supported by the government's recommendation with the National Sports Banner movement, namely: "Socializing sports and exercising society". So that with this exercise, it is expected that the degree of health and physical fitness will increase.

Therefore, high physical fitness is needed by all people, both school age children, universities and the general public. By having high physical fitness, students will be able to carry out daily activities for a longer time than students who have low physical fitness. Physical fitness is essentially a condition of the body that reflects a person's ability to do daily work without experiencing excessive fatigue and is still able to do other activities. Physical fitness has an important meaning for humans, among others, it can improve the function of organs, social emotional, sportsmanship, and the spirit of competition. Physical fitness is made up of 11 parts - 6 of them health related and 5 skill related. All of the parts are important to good performance in physical activity, including sports. But the 6 are referred to as contributing to *health-related physical fitness* because scientists in kinesiology have shown that they can reduce your risk of chronic disease and promote good health and wellness. These parts of fitness are *body composition, cardiorespiratory endurance, flexibility, muscular endurance, power, and strength*. They also help you function effectively in daily activities (Corbin & Le Masurier, 2021).

In line with that, physical fitness according to WHO is "the ability to perform physical activities." Meanwhile, according to The American College of Sports Medicine (ACSM) "physical fitness is the ability to do moderate and active physical activity without experiencing fatigue and having the ability to live life. Besides that, good physical fitness will greatly help prevent the body from diseases due to lack of movement".

Physical fitness is a very important aspect of overall body fitness which gives students the ability to survive to take part in the learning process that takes place both in class and outside the classroom, they do not tire quickly to lead a productive life and can adjust to any physical load that is worth it.

Tangkudung (2006: 62) explains that good physical condition will affect psychological aspects in the form of increased work motivation, work morale, self-confidence, thoroughness and so on. Psychologically, the physical condition also seems to have a very big influence on the environment of our activities, especially in socializing. Socializing is meant to be active in sports.

The conditions in the field are: 1) most of the students think that physical fitness is mainly related to the vital capacity of the lungs, nutritional status, physical activity and motivation to exercise are not important because so far what is more important is achievement in sports. as well as in the academic field. Of course, this is not true because a person without good physical fitness will not possibly have a good performance in his academics or achievement. As a result of the students' physical fitness is very low, this has an impact on student learning activities who always feel tired when participating in further teaching and learning activities. 2) the lack of motivation of students in participating in Physical Education learning activities for various reasons that are not quite right, 3) Students think that the vital capacity of the lungs, nutritional status, physical activity and motivation to exercise are less important and there are many more problems that need to be studied for further scientific research.

In exercising, a person must be able to synergize various basic movement skills, game/ sports techniques and strategies, internalization of values (sportsmanship, honest cooperation, etc.) from habituation to a healthy lifestyle. It is a common hope in the learning process that every student must have good physical fitness. In the teaching and learning process there are several components that are interconnected, the components in question are lecturers, students, learning objectives, teaching materials, learning models, situations, and evaluation of learning, and the environment. These components interact with one another and lead to one goal, namely changes in the behavior of students which include the realms of intellectual, emotional and spiritual intelligence as well as improving the physical fitness of students. Good physical fitness of students at the universities or schools is important to improve their capacity. For some individuals, ability to carry on usual activities is central and fundamental to their conception of good health and for this reasons, good health is identified with "physical fitness," conceived as an absolute state attainable by following certain rules, and which may be assessed in terms of performance on various tests of gymnastic proficiency (Baumann, Barbara, 1961).

Thus, the higher the vital capacity of the lungs, nutritional status, physical activity and motivation to exercise a person, the better the category of the person's physical fitness level and conversely the lower the vital capacity of the lungs, nutritional status, physical activity, the lower the level. physical fitness of the person.

Based on the above problems, this research is directed at the vital capacity of the lungs, nutritional status, physical activity and motivation to exercise. These four types of variables have different test procedures which are expected to improve physical fitness. Thus, we want to know this effect through a deeper study by conducting research with the title "The influence of vital lung capacity, nutritional status, physical activity and exercise motivation on physical fitness in students of SMPN 1 Baranti, Sidrap Regency".

Research Objectives

This study aims to determine the vital capacity of the lungs, nutritional status, physical activity and motivation to exercise on physical fitness in students of SMPN 1 Baranti, Sidrap Regency.

LITERATURE REVIEW

Physical Fitness

Physical fitness is an indicator in determining the degree of dynamic health of a person which is the basic physical ability to be able to carry out the tasks that must be carried out. With a healthy and fit physique, a person can carry out their daily activities optimally. A person's fitness will have an influence on one's performance and will also provide positive support for work or study productivity.

Physical fitness according to Wahjoedi (2008: 23) is the body's ability to perform daily tasks and work actively, without experiencing significant fatigue and with the remaining energy reserves it is still able to enjoy free time and face unexpected emergencies. .

Furthermore, Wahjoedi (2003: 58) stated that in everyday life, physical fitness will describe a person's life in harmony, enthusiasm and creatively. In other words, a person who is fit is a person who has a healthy outlook, is bright about his life both for the present and the future, maintains self-respect and has relationships with fellow human beings.

According to Mutohir and Maksum (2007: 51) physical fitness is the body's ability to carry out activities without experiencing significant fatigue. A person who is in good shape means that he is not easily tired and tired. He can do daily work optimally, not lazy or even quit prematurely. Furthermore, according to Mutohir and Maksum, when referring to this definition, it appears that this condition is not shared by most of our people. Moreover, it is completely healthy as defined by the WHO. This is because the world health organization defines health not only in terms of body, but also spiritually and socially. Mutohir and Maksum (2007: 51).

According to Nurhasan (2005: 17) physical fitness is a condition of a person's body that has an important role in daily activities or activities. Physical freshness also means the ability to carry out daily activities with full vitality and alertness without experiencing significant fatigue and still having enough energy to do activities at leisure and face matters of an emergency.

Physical fitness according to the Indonesian Ministry of Health (2009: 9) is the ability of a person's body to do daily work for a relatively long period of time without causing significant fatigue. Physical fitness is the ability of a person to carry out his daily tasks easily, without feeling excessively tired, and still having leftover or spare energy to enjoy his spare time and sudden needs. It can also be added that physical fitness is the ability to carry out a task well even in difficult circumstances, where people who are less fresh will not be able to do it.

Physical fitness according to Giriwijoyo and Sidik (2007: 43) is a dynamic healthy degree of a person which is a physical ability which is the basis for the successful implementation of tasks that must be carried out. Therefore, it is necessary to develop and maintain one's physical fitness for the successful implementation of this task, there is a need for a match between the requirements that must be met, namely anatomical and physiological in nature to the types and intensity of physical tasks that must be carried out.

According to Mukholid (2007: 44) physical fitness is related to a person's body organs to carry out their duties properly every day without experiencing significant fatigue. The level of physical fitness is very important and in accordance with the needs of students who are always faced with a busy schedule of activities, because if physical fitness increases, it will be able to provide meaningful things for physical endurance. A person having a high level of physical fitness will have the strength and endurance to carry out life activities without experiencing significant fatigue.

Physical fitness is the body's ability to function efficiently and effectively. It consists of health-related physical fitness and skill-related physical fitness, which have at least 11 components, each of which contributes to total quality of life. Physical fitness also includes metabolic fitness and bone integrity. Physical fitness is associated with a person's ability to work effectively, enjoy leisure time, be healthy, resist hypokinetic diseases, and meet emergency situations. It is related to, but different from, health, wellness, and the psychological, sociological, emotional-mental, and spiritual components of fitness. Although the development of physical fitness is the result of many things, optimal physical fitness is not possible without regular exercise (Corbin, et al., 2008). Corbin therefore argue that the components of skill-related physical fitness are agility, balance, coordination, power, reaction time, and speed as illustrated in the following pictures. They are called skill-related because people who possess them find it easy to achieve high levels of performance in motor skills, such as those required in sports

and in specific types of jobs. Power is sometimes referred to as a combined component of fitness, since it requires both strength (a health-related component) and speed (a skill-related component).



Agility—The ability to rapidly and accurately change the direction of the movement of the entire body in space. Skiing and wrestling are examples of activities that require exceptional agility (Corbin, et al., 2008), Alpine Skiing (RedBull).



Balance—The maintenance of equilibrium while stationary or while moving. Water skiing, performing on the balance beam, and working as a riveter on a high-rise building are activities that require exceptional balance (Corbin, 2008), Savitri (2020)



Coordination—The ability to use the senses with the body parts to perform motor tasks smoothly and accurately. Juggling, hitting a tennis ball, and kicking a ball are examples of activities requiring good coordination (Corbin, 2008), Tim Indonesia (2020)



Power—The ability to transfer energy into force at a fast rate. Throwing the discus and putting the shot are activities that require considerable power (Corbin, et al., 2008), Andita (2020)



Reaction time—The time elapsed between stimulation and the beginning of reaction to that stimulation. Driving a racing car and starting a sprint race require good reaction time (Corbin, et al., 2008), Ayello (2016)



Speed—The ability to perform a movement in a short period of time. Sprinters and wide receivers in football need good foot and leg speed (Corbin, et al., 2008), Jones (2021)

From some of the definitions of physical fitness above, it can be concluded that physical fitness is related to the ability and physical ability of a person to carry out his daily tasks with enthusiasm effectively and efficiently in a relatively long time without causing significant fatigue, and still has spare energy to carry out other activities

Lung Vital Capacity

According to Syarifudin (2003: 198), the lung is a body organ which mostly consists of alveoli bubbles. In the lungs, there is an exchange of substances between oxygen drawn from the air into the blood and carbon dioxide removed from the blood by osmosis. The lungs have the ability to accommodate air in them which is called the lung capacity. Furthermore, Syarifudin (2003: 198) defines the vital capacity in his book as follows, "Vital capacity is the amount of air that can be expelled after maximum inspiration".

The same thing was stated by Sutopo and Permana (2001: 9) in the Basic Physiology Practicum Guide book that "KV (Vital Capacity) is the maximum volume exhaled after maximum inspiration". Thus, vital capacity (vital capacity) is the maximum volume of air that the lungs can accommodate, after maximizing inspiration and expiration. The vital capacity of the lungs is also influenced by three things, namely the inspiratory reserve volume, tidal volume and expiratory reserve volume. Exercise and exercise can affect a person's lung capacity.

The removal of increased carbon dioxide is carried out by the respiratory system. So that in intensive exercise, the frequency and depth of breathing will increase to produce increased pulmonary ventilation. As for the usefulness of this increase in lung ventilation, it will increase the delivery of O₂ and accelerate the removal of CO₂. Trained athletes have a tendency that the depth of breathing is significantly increased, while the respiratory rate is not so significant (Woro, 1999: 22).

Breathing can be regulated by oneself when doing physical activities such as regular exercise so that students can hold, slow down or accelerate their breathing. That's because the respiratory system is regulated by the cerebral cortex, but when students are concentrating while competing or practicing, they don't have time to do this so the breathing process will occur automatically in our bodies, because the respiratory center is stimulated when the blood experiences excess CO₂ and decreases in O₂ in the blood. Oxygen that is taken from the air through the respiratory system will be accommodated in the lungs, then O₂ is carried by the blood to the heart to be distributed to all tissues that need oxygen.

3. Nutritional Status

According to Suparsia (2002: 17) there are several experts who give their opinions about nutrition. For example Sunita Almtsier, she argues that nutrition is:

"A process of organisms using food that is consumed normally through the process of digestion, absorption, transportation, storage, metabolism and excretion of substances that are not used to maintain life, growth and normal function of organs, and produce energy".

This is reinforced by the opinion regarding nutrients according to Ludfi (2012: 8) according to him that nutrients are substances that are obtained by the body and come from food, it is said that the body's need for nutrients cannot be fulfilled by just one or two foods. because in general there is no single food ingredient that contains very complete nutrition.

This is also in line with the definition put forward by Ludfi (2012: 8), which states that the meaning of nutrition is any substance that is digested, absorbed and used to promote the continuity of the body's physiology. Some nutrients can be made by the body itself and most others must be obtained from food consumed every day through food. " According to Djoko PekikIrianto in Mintarti (2012: 11) nutritional status is an expression of a

state of balance in the form of certain variables or It can be said that nutritional status is an indicator of whether or not the provision of daily food is good ". Supariasa (2012: 8) also argues that nutritional status is "an expression of a state of balance in the form of certain variables or a manifestation of nutriture in the form of certain variables".

Nutritional status is an expression of a state of balance in the form of a certain value or it can be said that nutritional status is an indicator of whether or not the provision of daily food is good. A good nutritional status is needed to maintain a degree of fitness and health, help growth for human growth and support sports performance.

4. Physical Activity

Domain Nieman (in Rosidi, 2000: 32) expresses an opinion about physical activity, he argues that physical activity is:

"Everybody movement is due to the activity of the skeletal muscles which results in energy expenditure. Physical activity consists of activities during work, sleep and leisure (normal and informal activities). Everyone does physical activity to survive. The amount of variation between one individual and another depends on the individual's lifestyle on the individual's lifestyle and other factors ".

In line with the expert opinion above regarding physical activity, this is reinforced by Almatsier in Indawagita (2009: 6) who defines physical activity as "physical movements performed by the muscles of the body and its supporting systems". Based on the various opinions above, it can be concluded that physical activity is an activity related to human body movements which functions to increase the functional abilities of the body organs and to maintain physical freshness.

Nieman in Rosidi (2000: 32) also argues that physical exercise is not the same as physical activity. Physical exercise is: "Part of physical activity that is planned, structured, done repeatedly and aims to improve or maintain physical fitness. In essence, physical sports activities are included in physical exercise, because they are generally done to improve or maintain physical fitness. Household and chores are usually carried out without considering the aspect of physical fitness. However, a person can carry out household and work tasks in a more active manner and generate physical fitness at the same time that the job is done ".

According to Murray and Hunter (in Rosidi, 2000: 32-33) "Physical exercise will cause reactions from the body organs in the form of adjustment efforts. Adjustment reactions can take the form of temporary or more permanent functions of the organs of the body. Adaptation is a permanent change in the structure or function of the body's organs as a result of the training given. This situation makes it easier for the body to react to the demands of physical activities given. Adaptation will be seen after the training lasts for several weeks / months. Thus adaptation will occur after long-term and regular exercise.

Exercise Motivation

The term motivation (motivation) comes from Latin, namely *movere*, which means "to move" (to move). Motivation represents the psychological processes, which cause the emergence, direction, and persistence of voluntary activities directed towards certain goals. Managers need to understand psychological processes, if they are to successfully coach their employees in the pursuit of organizational goals.

According to Sardiman (2011: 73), the word "motive" is defined as an effort to encourage someone to do something. Motive can be said to be the driving force from within and within the subject to carry out certain activities in order to achieve a goal. This can be interpreted as an internal condition (preparedness). Starting from the word "motive", motivation can be interpreted as a driving force that has become active. Motive becomes active at certain times, especially when the need to achieve goals is felt / urgent.

Motivation in the large Indonesian dictionary (2003: 758) is an impulse that arises in a person consciously or unconsciously to carry out an action with certain goals or efforts that can cause a person or group of people to be moved to do something because they want to achieve their desired goals or get satisfaction with his actions.

According to Syamsuddin (2009: 37) although experts define motivation in different styles, but its essence leads to the same purpose, motivation is: 1) a force or energy, 2) a state complex state (a complex state) and readiness (preparatory set) within the individual (organism) to move (to move, motion, motive) towards a certain goal, whether consciously or unconsciously.

Dörnyei & Ottó's in Weda, et al. (2018) define motivation as dynamically changing cumulative arousal in a person that initiates, directs, coordinates, amplifies, terminates, and evaluates the cognitive and motor processes whereby initial wishes and desires are selected, prioritized, operationalized and (successfully or unsuccessfully) acted out.

Brown in Weda (2018: 135) stated that motivation is commonly thought of as an inner drive, impulse, emotion, or desire that moves one to a particular action. Brown in Weda (2018: 135) therefore revealed that in more technical terms, motivation refers to "the choices people make as to what experiences or goals they will approach to avoid, and the degree of effort they will exert in that respect." Motivation is considered as an integral part in the achievement of any goals (Rahmat, et. al.: 2016).

Motivation according to Winardi (2007: 6) is a potential power that exists within a human being, which he can develop himself or develop by a number of outside forces which essentially revolve around monetary rewards and non-monetary rewards, which can affect his work results positively or in a positive way. negative, which depends on the situation and conditions faced by the person concerned. Meanwhile, according to Faturrohman and Sutikno (2010: 19) in learning activities, motivation can be said to be the overall driving force within students that raises, ensures continuity and provides direction for learning activities, so that it is expected that existing goals can be achieved.

According to Rivai and Murni (2009: 732) there are two motivations, namely intrinsic motivation and extrinsic motivation. 1) Intrinsic motivation. This type of motivation arises from within the individual himself without compulsion from other people, but on the basis of his own volition. 2) Extrinsic motivation. This type of motivation arises as a result of influence from outside the individual, whether because of an invitation, order, or coercion from other people so that in this situation students want to do something or learn.

Thus, from the above description, it can be concluded that the nature of motivation is divided into two, namely intrinsic motivation and extrinsic motivation. Intrinsic motivation is a psychological drive that comes from oneself, while extrinsic motivation is a psychological boost that arises from external factors. The two characteristics of the motivation to exercise give birth to two categories: (1) students who have high exercise motivation and (2) students who have low exercise motivation. From some opinions of experts, it is synthesized that exercise motivation is a process of psychologically driving a person to do something in learning activities in order to achieve a goal (a need) which is influenced by extrinsic and intrinsic properties, with indicators namely the desire to succeed, self-confidence, the need for respect, and a standard of excellence.

Research Hypothesis

Based on theoretical studies and theoretical frameworks, several hypotheses were obtained, namely;

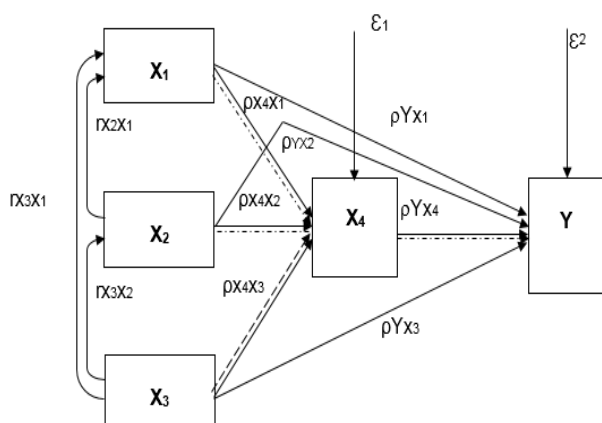
1. The vital capacity of the lungs has a direct effect on physical fitness for male students at SMPN 1 Baranti, Sidrap Regency.
2. Nutritional status has a direct effect on physical fitness for male students at SMPN 1 Baranti, Sidrap Regency.
3. Physical activity has a direct effect on physical fitness of the pitra students of SMPN 1 Baranti, Sidrap Regency.
4. Motivation to exercise has a direct effect on physical fitness in male students of SMPN 1 Baranti, Sidrap Regency.
5. The vital capacity of the lungs has a direct effect on the motivation to exercise in male students of SMPN 1 Baranti, Sidrap Regency.
6. Nutritional status has a direct effect on the motivation to exercise in male students of SMPN 1 Baranti, Sidrap Regency.
7. Physical activity has a direct effect on the motivation to exercise in students of SMPN 1 Baranti, Sidrap Regency.
8. The vital capacity of the lungs through the motivation to exercise simultaneously has a direct effect on physical fitness in students of SMPN 1 Baranti, Sidrap Regency.
9. Nutritional status through exercise motivation simultaneously has a direct effect on physical fitness for students of SMPN 1 Baranti, Sidrap Regency.
10. Physical activity through exercise motivation simultaneously has a direct effect on physical fitness for students of SMPN 1 Baranti, Sidrap Regency.

RESEARCH METHODOLOGY

Research Methods

The research method is a way to solve problems or how to develop science using the scientific method. The research method is a very important factor in a study. In accordance with the problems and research objectives to be achieved, this study uses a survey method by looking at the causality between variables. Data analysis techniques using path analysis (path analysis). This path analysis technique can be used to test the direct and indirect effects on the vital capacity of the lungs, nutritional status, physical activity, motivation to exercise, and physical fitness in students of SMPN 1 Baranti, Sidrap Regency, South Sulawesi Indonesia.

The research design can be seen in the following figure.



Picture. 1. Research Design

Place of Research

This research was conducted at the school yard of SMPN 1 Baranti, Sidrap Regency. Furthermore, the research was carried out in April 2018.

Data Collection Techniques

Nasir (2003: 328) suggests that data collection techniques are measurement tools needed to carry out a study. The data to be collected can be in the form of numbers, written statements, oral information and various facts related to the research focus under study.

As stated above, the data collection technique and its form to be collected, the data collection technique means an important step in a study, where to collect data the researcher uses test and measurement techniques, the test is a measuring tool to obtain data or information (Nurhasan, 2001: 12). In this study, the researchers used a variety of tests to collect data. The research instruments are (1) vital lung capacity test, (2) nutritional status test, (3) physical activity, (4) exercise motivation test and (5) fitness test for male students at SMPN 1 Baranti, Sidrap Regency, South Sulawesi, Indonesia.

Data Analysis Techniques

The data analysis techniques used in this study are as follows:

1. Descriptive statistics, namely statistics that aim to provide an overview of the research variable data.
2. Test requirements analysis, namely: (1) normality test, and (2) homogeneity test. (3) Statistical hypothesis testing. Statistical test is done by testing the correlation to see the relationship that occurs between exogenous variables and endogenous variables which are related to each other.

RESULTS AND DISCUSSION

Research Results

The results of this frequency descriptive analysis are primary data on test results and measurements of physical fitness (Y), vital lung capacity (X1), nutritional status (X2), physical activity (X3), and exercise motivation (X4). The basic data in this study are then equated with the units using T score, so that the data become interval data which can then be used to analyze the data completely with a statistical approach and it is known that the maximum, minimum, range, average, standard deviation, and median values and frequency distribution as presented in the table below:

Table 1. Distribution of research data

Statistic	Variabel				
	X ₁	X ₂	X ₃	X ₄	Y
N	30	30	30	30	30
Mean	52.93	53.70	54.20	54.03	55.77
Std. Deviation	3.463	3.375	4.080	4.181	3.945
Range	13	13	16	15	13
Minimum	49	50	49	49	53
Maximum	62	63	65	64	66
Sum	1588	1611	1626	1621	1673

Based on table 1, it can be described as follows:

1. Physical fitness (Y) male students of SMPN 1 Baranti, SidenrengRappang Regency, South Sulawesi Indonesia. Of the 30 students, the highest score was 66 and the lowest score was 53, it was obtained a range value of 13 with a total value of 1673, while for an average value of 55.77 and a standard deviation of 10.038.
2. The vital capacity of the lungs (X1) for male students of SMPN 1 Baranti, SidenrengRappang Regency, a sample of 30 male students obtained the highest score of 62 and the lowest score of 49, obtained a value span of 13 with a total value of 1588 while for an average value of 52, 93 and the standard deviation of 3.463.
3. Nutritional status (X2) of male students at SMPN 1 Baranti, SidenrengRappang Regency. A sample of 30 male students obtained the highest score of 63 and the lowest score of 50 obtained a range value of 13 with a total value of 1611 while the average value was 53.70 and the standard deviation was 3.375.
4. Men's physical activity. The results of the study regarding the physical activity data (X3) of students of SMPN 1 Baranti, Sidrap Regency, consisting of 30 male samples, obtained the highest score of 65 and the lowest score of 49, the value of the range was 16 with a total value of 1626, while the average score was 54.20 and deviation standard of 4,080.
5. Motivation to exercise (X4) students of SMPN 1 Baranti, SidenrengRappang Regency, consisting of 30 male samples, obtained the highest score of 64 and the lowest score of 49, obtained a range value of 15 with a total value of 1621 while for an average value of 54.03 and standard deviation of 4.181.

Table 2. Recapitulation of the results of the calculation of the normality test of research data

No	Variabel	N	K-SZ _{hit}	Sig. (p)
1	The vital capacity of the lungs (X ₁)	30	1,130	0,156
2	Nutrition status (X ₂)	30	1,056	0,215
3	Physical activity (X ₃)	30	1,203	0,111
4	Sports motovation (X ₄)	30	1,113	0,168
5	Physical fitness (Y)	30	1,700	0,076

Based on the tabulation, the Kolmogorov-Smirnov Z count (K-SZ_{hit}) value for all data groups is greater than $\alpha = 0.05$. Thus, it can be concluded that the male sample of this study came from a population with a normal distribution, while the explanation can be described as follows;

- 1) The results of the calculation of the physical fitness normality test for students of SMPN 1 Baranti, Sidrap Regency (Y) with a sample of 30 male samples at the real level $\alpha = 0.05$ (5%), the KS-Zhitung value was 1,700 with a significant level (p) of 0.076 or (K-SZ_{hit} > $\alpha = 0.05$), so that, H₀ is accepted and H₁ is rejected. Thus, it can be concluded that the physical fitness of men and women (Y) comes from a population that has a normal distribution.
- 2) The results of the calculation of the lung vital capacity normality test of students of SMPN 1 Baranti, Sidrap Regency (X1) with 30 male samples at the real level $\alpha = 0.05$ (5%), the KS-Zhitung value was 1.130 with a significant level (p) 0.156 (K-SZ_{hit} > $\alpha = 0.05$), so that H₀ is accepted and H₁ is rejected. Thus it can be stated that the vital capacity of the male lungs comes from a population with a normal distribution.
- 3) The results of the calculation of the nutritional status normality test of the students of SMPN 1 Baranti, Sidrap Regency (X2) with a sample of 30 male samples at the real level $\alpha = 0.05$ (5%), the KS-Zhitung values were 1.056 and 1.117 with a significant level (p) 0.215 and 0.165 (K-SZ_{hit} > $\alpha = 0.05$), so that H₀ is accepted and H₁ is rejected. Thus it can be argued that the nutritional status of men comes from populations with normal distribution.
- 4) The results of the calculation of the physical activity normality test for students of SMPN 1 Baranti, Sidrap Regency (X3) with a total sample of 30 male samples at the real level $\alpha = 0.05$ (5%), the KS-Zhitung value was 1.203 with a significant level (p) 0.111 or (K-SZ_{hit} > $\alpha = 0.05$), so that H₀ is accepted and H₁ is rejected. Thus it can be argued that physical activity comes from a population with a normal distribution.
- 5) The results of the calculation of the normality test for the motivation to exercise of students of SMPN 1 Baranti, Sidrap Regency (X4) with a total sample of 30 male students at the real level $\alpha = 0.05$ (5%), the KS-Zhitung value was 1.113 with a significant level (p) 0.168 (K-SZ_{hit} > $\alpha = 0.05$), so that H₀ is accepted and H₁ is rejected. Thus it can be concluded that the motivation to exercise (X4) comes from a population that has a normal distribution.

Furthermore, after the data on the effect of vital lung capacity, nutritional status, physical activity, and motivation to exercise on overall physical fitness are normally distributed, it is followed by hypothesis testing. For more details, it can be explained in the following description;

Table 3. Recapitulation of the results of the calculation of the hypothesis test of the research data of male students at SMPN 1 Baranti, SidenrengRappang Regency

Model	PA	R	R Square	Uji-t	Sig.
X ₁ *Y	PA	.917 ^a	.842	12.201	.000
X ₂ *Y	PA	.904 ^a	.817	11.162	.000
X ₃ *Y	PA	.845 ^a	.714	8.357	.000
X ₄ *Y	PA	.924 ^a	.855	12.832	.000
X ₁ * X ₄	PA	.862 ^a	.743	9.005	.000
X ₂ * X ₄	PA	.846 ^a	.716	8.405	.000
X ₃ * X ₄	PA	.853 ^a	.727	8.633	.000
X ₁ * X ₂	PA	.978 ^a	.956	24.617	.000
X ₂ * X ₃	PA	.751 ^a	.564	6.014	.000
X ₁ * X ₃	PA	.782 ^a	.611	6.635	.000

Based on table 3 of hypothesis testing results, it turns out that the ten proposed hypotheses show results that have a positive correlation. The description of the hypothesis can be explained as follows:

1. The results of the research on the hypothesis which states that physical fitness (Y) and vital lung capacity (X₁) produce a predictive model, that the multiple correlation coefficient (R) is obtained a value of 0.917 after being consulted with r table on degrees of freedom (n-1) 30 - 1 = 29 with $\alpha = 0.05$ of 0.367, then the variable X₁ to Y has a significant positive correlation. R Square (coefficient of determination) obtained a value of 0.842 which means 84.2% of the total variation in physical fitness (Y) is caused by a multiple regression relationship with the variable vital capacity of the lungs (X₁). This means that 84.2% of the data on vital lung capacity (X₁) has a direct effect on physical fitness (Y) and the rest for men is 15.8% or (100% - 84.2% = 15.8%) due to by other factors not included in this study. Furthermore, the calculation results in the regression coefficient table, obtained the value of t = 12.201 and t table (0.05.30) = 2.042 with a significant level of 0.000 less than $\alpha = 0.05$, thus (tcount>ttable,) means that H₀ is rejected, and H₁ accepted. From the results of these calculations it can be stated that the hypothesis proposed: vital lung capacity (X₁) contributes to physical fitness (Y) is accepted.

2. The results of the research on the hypothesis which states that physical fitness (Y) and nutritional status (X₂) produce a predictive model, that the multiple correlation coefficient (R) is obtained a value of 0.904 after being consulted with r table on degrees of freedom (n-1) 30 - 1 = 29 with $\alpha = 0.05$ of 0.367, then the variable X₂ to Y has a significant positive correlation. R Square (coefficient of determination) obtained a value of 0.817, which means 81.7% of the total variation in physical fitness (Y) is caused by the multiple regression relationship with the variable nutritional status (X₂). This means that 81.7% of nutritional status data (X₂) has a direct effect on physical fitness (Y) and the remaining 18.3% or (100% - 81.7% = 18.3%) is caused by other factors. which were not included in this study. Furthermore, the results of the t test calculation on the regression coefficient table, obtained the value of t = 11.162 and t table (0.05) = 2.042 with a significant level of 0.000 less than $\alpha = 0.05$, thus (tcount>ttable,) means that H₀ is rejected, and H₁ accepted. From the results of these calculations it can be stated that the hypothesis proposed, nutritional status (X₂) contributing to physical fitness (Y) is accepted.

3. The results of the research on the hypothesis which states that physical fitness (Y) through physical activity (X₃) produces a predictive model, that the multiple correlation coefficient (R) is obtained a value of 0.845 after being consulted with r table on degrees of freedom (n-1) 30 - 1 = 29 with $\alpha = 0.05$ of 0.367, then the variable X₂ against Y has a significant positive correlation. R Square (coefficient of determination) obtained a value of 0.714, which means 71.4% of the total variation in physical fitness (Y) is caused by multiple regression relationships with physical activity variables (X₃). This means that 71.4% of physical activity data (X₃) has a direct effect on physical fitness (Y) and the remaining 28.6% or (100% - 71.4% = 28.6%) is caused by other factors. which were not included in this study. Furthermore, from the results of the t test analysis, the value of t count = 8.357 and t table (0.05) = 2.042 with a significant level of 0.000, thus (tcount>ttable), means that H₀ is rejected, and H₁ is accepted. From the results of these calculations it can be stated that the hypothesis proposed: physical activity (X₃) contributes to physical fitness (Y) is accepted.

4. The results of the research on the hypothesis which states that physical fitness (Y) through exercise motivation (X₄) produces a predictive model, that the multiple correlation coefficient (R) is obtained a value of 0.924 for men and 0.933 for women after being consulted with r table on degrees of freedom (n -1) 30 - 1 = 29 with $\alpha = 0.05$ of 0.367, then the variable X₄ to Y has a significant positive correlation. R Square (coefficient of determination) obtained a value of 0.855 for boys, 0.870 for girls, which means 85.5% for boys and 87.0% for girls from the total variation in physical fitness (Y) due to the multiple regression relationship with exercise motivation variable (X₄). This means that 85.5% for men and 87.0% for women, the motivation to exercise data (X₄) has a direct effect on physical fitness (Y) and the remaining 14.5% or (100% - 85.5% = 14, 5%) caused by other factors not included in this study. Furthermore, from the results of the t test analysis, the value of t count = 12.832 and t table (0.05) = 2.042 with a significant level of 0.000, thus (tcount>ttable), means that H₀ is

rejected, and H1 is accepted. From the results of these calculations it can be stated that the hypothesis proposed: exercise motivation (X4) contributes to physical fitness (Y) is accepted.

5. The results of the research on the hypothesis which states that the vital capacity of the lungs (X1) through exercise motivation (X4) produces a predictive model, that the multiple correlation coefficient (R) is obtained a value of 0.862 after being consulted with r table on degrees of freedom $(n-1) 30 - 1 = 29$ with $\alpha = 0.05$ of 0.367, then the variable X1 against X4 has a significant positive correlation. R Square (coefficient of determination) obtained a value of 0.743, which means 74.3% of the total variation in motivation to exercise (X4) is caused by the multiple regression relationship with the variable vital capacity of the lungs (X1). This means that 74.3% of the data on the vital capacity of the lungs (X1) has a direct influence on the motivation to exercise of students at SMPN 1 Baranti, Sidrap Regency (X4) and the rest is 25.7% or $(100\% - 74.3\% = 25.7\%)$ for male and the remaining 28.7% or $(100\% - 71.3\% = 28.7\%)$ caused by other factors not included in this study. Furthermore, the t-test calculation results obtained the value of $t = 9.005$ and t table $(0, 05) = 2,042$ with a significant level of 0,000, thus $(t_{count} > t_{table})$, it means that H_0 is rejected, and H1 is accepted. From the results of these calculations it can be stated that the hypothesis proposed: vital lung capacity (X1) contributes to exercise motivation (X4) The results of this hypothesis analysis provide the finding that the vital capacity of the lungs contributes to the motivation to exercise This finding means that if you want to increase the motivation to exercise, it can be done by increasing the vital capacity of the lungs.

6. The results of the research on the hypothesis which states that nutritional status (X2) through exercise motivation (X4) produces an assumption model that the multiple correlation coefficient (R) is obtained a value of 0.846 after being consulted with r table on degrees of freedom $(n-1) 30 - 1 = 29$ with $\alpha = 0.05$ of 0.367, then the variable X2 against X4 has a significant positive correlation. R Square (coefficient of determination) obtained a value of 0.716 for men and 0.640 for women, which means that 71.6% of the total variation in exercise motivation (X4) is caused by multiple regression relationships with variable nutritional status (X2). This means that 71.6% for boys and 64.0% for girls, the nutritional status data (X2) has a direct influence on the motivation to exercise students of SMPN 1 Baranti, Sidrap Regency (X4) and the rest is 28.4% or $(100\% - 71.6\% = 28.4\%)$ for men and the remaining 36% or $(100\% - 64.0\% = 36\%)$ for women caused by other factors not included in this study. Furthermore, from the results of the t-test calculation, the value of $t = 8.405$ for men and 7.062 for women and t table $(0.05) = 2.042$ with a significant level of 0.000, thus $(t_{count} > t_{table})$, means that H_0 is rejected, and H2 is accepted. From the results of these calculations it can be stated that the hypothesis proposed: nutritional status (X2) contributes to exercise motivation (X4) is accepted.

7. The results of the research on the hypothesis which states that physical activity (X3) through exercise motivation (X4) produces a predictive model, that the multiple correlation coefficient (R) is 0.853 for boys and 0.802 for girls after being consulted with r table on degrees of freedom $(n - 1) 30 - 1 = 29$ with $\alpha = 0.05$ of 0.367, then the variable X3 to X4 has a significant positive correlation. R Square (coefficient of determination) obtained a value of 0.717, which means 71.7% of the total variation in exercise motivation (X4) is caused by the multiple regression relationship with the physical activity variable (X3). This means that 71.7% of physical activity data (X3) has a direct influence on the motivation to exercise of students at SMPN 1 Baranti, Sidrap Regency (X4) and the rest is 28.3% or $(100\% - 71.7\% = 28.3\%)$ caused by other factors not included in this study. Furthermore, from the results of the t test calculation, the value of t count = 8.633 and t table $(0.05) = 2.042$ with a significant level of 0.000, thus $(t_{count} > t_{table})$, it means that H_0 is rejected, and H3 is accepted. From the results of these calculations it can be stated that the hypothesis proposed: physical activity (X3) contributes to exercise motivation (X4) is accepted.

8. The results of the research on the hypothesis which states that the vital capacity of the lungs (X1) on the nutritional status of students of SMPN 1 Baranti, Sidrap Regency (X2) produces a predictive model, that the multiple correlation coefficient (R) is obtained a value of 0.978 after being consulted with r table at degrees freedom $(n-1) 30 - 1 = 29$ with $\alpha = 0.05$ of 0.367, then the variable X1 to X2 has a significant positive correlation. R Square (coefficient of determination) obtained a value of 0.956, which means 95.6% of the total variation in nutritional status (X2) is caused by multiple regression relationships with the variable vital capacity of the lungs (X1). This means that 95.6% of the data on the vital capacity of the lungs (X1) has a direct influence on the nutritional status of students at SMPN 1 Baranti, Sidrap Regency (X2) and the rest is 4.4% or $(100\% - 95.6\% = 4.4\%)$ caused by other factors not included in this study. From the calculation of the regression coefficient above, the value of tcount = 24.617 and ttable $(0.05) = 2.042$ with a significant level of 0.001 is smaller than $\alpha = 0.05$, thus $(t_{count} > t_{table})$, means that H_0 is rejected, and H1 is accepted. From the results of these calculations it can be stated that the hypothesis proposed: vital lung capacity (X1) contributes to the nutritional status of students of SMPN 1 Baranti, Sidrap Regency (X2) is accepted.

9. The results of the research on the hypothesis which states that nutritional status (X2) through physical activity (X3) results in a predictive model, that the multiple correlation coefficient (R) is obtained a value of 0.751 after being consulted with r table on degrees of freedom $(n-1) 30-1 = 29$ with $\alpha = 0.05$ of 0.367, then the variable X2 against X3 has a significant positive correlation. R Square (coefficient of determination) obtained a value of

0.564, which means 56.4% of the total variation in physical activity (X3) is caused by multiple regression relationships with variable nutritional status (X2). This means that 56.4% of the nutritional status data (X2) has a direct effect on the physical activity of students at SMPN 1 Baranti, Sidrap Regency (X3) and the rest is 43.6% or $(100\% - 56.4\% = 43.6\%)$ caused by other factors not included in this study. Furthermore, from the results of the t test calculation, the value of t count = 4.483 and t table $(0.05: 30) = 2.042$ with a significant level of 0.000 less than $\alpha = 0.05$, thus $(t_{count} > t_{table})$, means that H_0 is rejected, and H_1 is accepted. From the results of these calculations it can be stated that the hypothesis proposed: nutritional status (X2) contributes to the physical activity of students of SMPN 1 Baranti, Sidrap Regency (X3) is accepted. The results of this hypothesis analysis provide findings that nutritional status contributes to physical activity.

10. The results of the research on the hypothesis which states that the vital capacity of the lungs (X1) through physical activity (X3) produces a predictive model, that the multiple correlation coefficient (R) is obtained a value of 0.782 after being consulted with r table on degrees of freedom $(n-1) 30 - 1 = 29$ with $\alpha = 0.05$ of 0.367, then the variable X1 to X3 has a significant positive correlation. R Square (coefficient of determination) obtained a value of 0.611, which means 61.1% of the total variation in physical activity (X3) is caused by multiple regression relationships with the variable vital capacity of the lungs (X1). This means that 61.1% of the data on vital lung capacity (X1) has a direct effect on the physical activity of students at SMPN 1 Baranti, Sidrap Regency (X3) and the rest is 38.9% or $(100\% - 61.1\% = 38.9\%)$ caused by other factors not included in this study. Furthermore, from the results of the t test calculation, the value of t count = 6.635 and t table $(0.05: 30) = 2.042$ with a significant level of 0.000 less than $\alpha = 0.05$, thus $(t_{count} > t_{table})$, means that H_0 is rejected, and H_1 is accepted. From the results of these calculations it can be stated that the hypothesis proposed: the vital capacity of the lungs (X1) contributes to the physical activity of students of SMPN 1 Baranti, Sidrap Regency (X3) is accepted.

Discussion

Based on the results of hypothesis testing about the effect of vital lung capacity, nutritional status, physical activity, and motivation to exercise on the physical fitness of male students at SMPN 1 Baranti, Sidrap Regency, the discussion is as follows:

1. The vital capacity of the lungs has a direct effect on physical fitness for male students at SMPN 1 Baranti, Sidrap Regency. The findings in this study are in line with the theoretical study stated earlier that a good vital lung capacity will be able to show good achievement as well. Thus it can be said that physical fitness can improve when paying attention to the vital capacity of the lungs to improve physical fitness.
2. Nutritional status has a direct effect on physical fitness for male students at SMPN 1 Baranti, Sidrap Regency. The findings in this study are in line with the theoretical studies stated earlier that good nutritional status will support good performance. Thus it can be said that physical fitness can increase when supported by good nutritional status.
3. Physical activity has a direct effect on physical fitness for students of SMPN 1 Baranti, Sidrap Regency. The findings in this study are in line with the theoretical studies stated earlier that the effect of good physical activity will be able to show good physical fitness as well. Thus it can be said that physical fitness can increase when physical activity increases so that physical fitness will be even higher.
4. Motivation to exercise has a direct effect on physical fitness in male students of SMPN 1 Baranti, Sidrap Regency. The findings in this study are in line with the theoretical studies stated earlier that the effect of good exercise motivation will be able to show good physical fitness as well. Thus it can be said that physical fitness can increase when the motivation to exercise increases so that physical fitness will be even higher.
5. The vital capacity of the lungs has a direct effect on the motivation to exercise in male students of SMPN 1 Baranti, Sidrap Regency. This finding means that if you want to increase your motivation to exercise, you can do this by increasing the vital capacity of the lungs.
6. Nutritional status has a direct effect on the motivation to exercise in students of SMPN 1 Baranti, Sidrap Regency. The results of this hypothesis analysis provide the finding that nutritional status contributes to exercise motivation. This finding means that if you want to increase your motivation to exercise, you can do this by increasing your nutritional status.
7. Physical activity has a direct effect on the motivation to exercise in male students of SMPN 1 Baranti, Sidrap Regency. The results of the analysis of this hypothesis provide findings that physical activity contributes to motivation to exercise. This finding means that if you want to increase your motivation to exercise, you can do this through increased physical activity.
8. The vital capacity of the lungs through the motivation to exercise simultaneously has a direct effect on physical fitness for male students of SMPN 1 Baranti, Sidrap Regency. The results of this hypothesis analysis provide findings that the vital capacity of the lungs contributes to nutritional status. This finding means that if you want to improve the nutritional status of male students at SMPN 1 Baranti, Sidrap Regency, you can pay attention to the vital capacity of the lungs.
9. Nutritional status through exercise motivation simultaneously has a direct effect on physical fitness in male students of SMPN 1 Baranti, Sidrap Regency. This is in line with the theory on the independent variables

described in the previous section. This finding means that if you want to improve the nutritional status of male students at SMPN 1 Baranti, Sidrap Regency, it can be done through exercise to increase physical activity.

10. Physical activity through exercise motivation simultaneously has a direct effect on physical fitness for male students of SMPN 1 Baranti, Sidrap Regency. This is in line with the theory on the independent variables described in the previous section. This finding means that if you want to increase the physical activity of male students at SMPN 1 Baranti, Sidrap Regency, it can be done through training to increase the vital capacity of the lungs.

CONCLUSION

Based on the results of the research and data analysis that has been carried out, as well as referring to the discussion, the overall hypothesis proposed is acceptable, thus it can be concluded that there is an effect of vital lung capacity, nutritional status, physical activity, and exercise motivation on male students' physical fitness at Senior High School (SMPN) 1 Baranti, Sidrap regency, Indonesia.

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