



ISSN (E): 2277- 7695

ISSN (P): 2349-8242

NAAS Rating: 5.03

TPI 2019; 8(9): 54-59

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www.thepharmajournal.com

Received: 04-07-2019

Accepted: 07-08-2019

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## Effect of bleep test on increasing blood sugar levels

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### Abstract

Every human being wants a healthy body condition so that it does not reduce the activities that will be carried out in daily activities. A healthy body condition can be obtained by diligently doing sports activities so as to create excellent physical fitness.

Physical fitness can be measured by the Bleep test, which is to see the fitness of the human body by running continuously between 2 lines that are 20 m long as the beep sounds are heard before. As a population and sample in this study were 17 students of the Faculty of Sport Sciences, Medan State University, who were taken randomly.

Based on the results of the study that began with the phenomenon that occurred then the problems and problems that were found and studied were supported and the data can be summarized as follows:

1. The results of blood glucose examination before and after the Bleep Test are significantly different from the standard deviation.
2. After the Bleep Test has been carried out, then the measurement of blood glucose is carried out with the influence of the Bleep Test on human blood glucose by 67.4%.

**Keywords:** Bleep test and blood sugar level test

### 1. Introduction

#### 1.1 Background to the problem

Physical health and fitness of the human body is a very important human need because it will create a physical atmosphere for humans to survive in a condition that is fresh and fit so that humans will be released from disease.

A human who has good physical health, that person will be able to carry out various life activities as well as possible by always maintaining his physical condition perfectly through regular sports activities.

Maintenance of the physical condition of human beings is very dependent on humans themselves really realize that the health of the human body is very expensive to maintain and maintain through regular sports activities.

The condition of a healthy human body is optimally formed in a process that is done early, starting from childhood to old age which is carried out routinely through sports movements so as not to feel tired in carrying out their life activities.

Sport is a very important part of human life where exercise is a necessity of human life because it can improve health and avoid disease in the human body which will make humans suffer.

Many health experts recommend that each individual perform regular physical activity because it can reduce the risk of various diseases including: heart disease, diabetes, and obesity.

By doing activities for body fitness every day will result in a healthy body condition and can anticipate the arrival of disease in humans.

A healthy body is the hope of every human being where a healthy body condition will affect the speed or movement of humans in carrying out daily activities where every human being strives to create a healthy body through regular sports.

WHO, 2010, explained that physical inactivity is the main factor that causes death in the world and 5% of these deaths are caused by obesity and obesity.

Then in Indonesia there are 71% of human deaths caused by a less active lifestyle so quickly affected by degenerative diseases consisting of: diabetes, obesity, heart disease, stroke, osteoporosis, alzheimer's, cancer and parkinsonism.

Physical fitness can be measured by the Bleep test, which is to see the fitness of the human body by running continuously between 2 lines that are 20 m long as the beep sounds are heard before.

To maintain blood sugar balance in the human body is done by physical exercise so that it can affect the body's metabolism, which is carbohydrate metabolism, which can increase blood

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sugar levels in the human body. To see the physical condition that is fit, of course, you should see the condition of the blood sugar levels found in the human body so that it must be maintained in balance with physical exercise so that there is no accumulation of blood sugar levels.

The level of sugar in the human body is controlled by the hormone insulin and maintained insulin deficiency and axes insulin in the human body so that there is no disease in the human body.

If the hormone insulin is less than needed in the human body will cause blood sugar to accumulate in the blood circulation so that blood glucose will increase, conversely if the insulin hormone increases to exceed the kidney threshold then blood glucose will come out with urine (Ministry of Health, 2008).

For measurement of blood sugar levels is a Bleep Test field test that can estimate the condition of the human body's cardiorespiratory fitness. The Bleep Test is very simple and very easy to run and does not take time and requires mini mall equipment.

To keep in shape need cardiorespiratory endurance is needed, namely the ability of the heart and the ability of the lungs and blood vessels to function optimally in a state of rest and exercise to take oxygen and distribute it to active tissue for use in the body's metabolic processes.

This study aims to determine how much the influence of the Bleep Test will increase blood sugar levels in UNIMED Sports Science students aged 19-24 years.

## 2. Problem formulation

Based on the background described in this study, it can be the problem is: Is there any influence Bleep Test Test to increased glucose blood sugar levels?.

## 3. Research purposes

### 3.1 General purpose

To find out whether there is an effect of the Bleep Test on increasing blood glucose.

### 3.2 Special purpose

The specific purpose of this study was to find out: Changes in blood sugar levels after performing the Bleep Test.

## 4. Benefits of research

In conducting various research activities, there are benefits of research that are expected by different researchers and as a whole depends on the researcher.

In this study, the expected benefits of research are:

### 1. Theoretical benefits

- a. This study is expected to be useful to provide information to other researchers regarding changes in blood sugar levels after the Bleep Test on UNIMED Sports Faculty students.
- b. This research is expected to be useful to the next researcher to be used as recommendations for other researchers in different environments.

### 2. Applicative benefits

- a. This research is expected to be used as a consideration for the community to carry out the Bleep Test as a simple test.
- b. This research is expected to be used as the development of science, especially in the health sector.

## 5. Blood glucose

Blood sugar is a carbohydrate fuel and an energy source that

is stored as glycogen which must be maintained in balance so that bodily functions can be maintained properly.

Glucose comes from Greek, namely Glukus, which means "Sweet" which is needed by the human body as a source of metabolic intermediates which acts as an energy source.

Every human being eating carbohydrates then it will be able to change the conditions of human blood sugar is fuel to the human body and must be kept blood glucose balance in the human body where human blood glucose to rise after a meal.

Then Joyce Lee Fever, 2007, said that the blood glucose is the sugar found in the blood that form of carbohydrates in the diet and are stored as glycogen in the liver and skeletal muscle.

## 6. Bleep test

The development and progress of science and technology in the present provides changes in various fields of science including in the field of sports which have experienced changes and advances in science throughout the year.

With the advancement of sports science and technology, many new findings are obtained both in terms of practice and theory that are supportive and are useful for improving VO2Max and sports performance.

Along with the development of science and technology, the form of training to improve VO2Max has also evolved, one of which is a form of exercise that is quite in demand to increase VO2Max at this time is a 12-minute run.

According to Cooper (1982), saying that a 12-minute run is a method for determining maximum oxygen consumption, the results are very precise, easy to implement and do not require tools, but only a track or distance that has been measured and yourself.

By doing 12 minutes of running regularly can increase VO2Max, without experiencing excessive fatigue and is also very determined by cardiovascular endurance, namely the ability of the heart, lung and blood vessels to carry oxygen maximally to the muscles. Therefore cardiovascular aerobic endurance by measuring maximal oxygen uptake (VO2Max) is a determinant of VO2Max and a person's level of physical fitness.

Another term for Bleep Test is Multistage 20m which means the Test Run continuously between 2 lines that are 20 meters away by hearing a beep that has been recorded.

Bleep test is one way to measure predictions of maximal aerobic strength or VO2Max.

Iztok Kavcic, *et al*, 2012, explaining that the Bleep test is the most valid test, safe and cheap and reliable to be performed by any person or group of people.

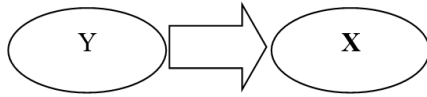
## 7. Thinking framework

In conducting research, it must be made a frame of mind that aims to facilitate the researcher in understanding and completing his research in a timely manner, as well as the readers about this research easily understand the purpose and content of this research.

A good frame of mind will be supported by a good description of the theory so that it can explain the relationship between variables. (Lumban Raja, Melva, 2011) <sup>[12]</sup>.

Uma Sekaran, 1992, said that the frame of mind is a conceptual model of how theory relates to various factors that have been identified as important problems.

In this study, the framework that can be built will explain how the influence of the independent variables on the dependent variable is as follows:



**Information**

X = Bleep Test Method.

Y = Blood Glucose.

**8. Hypothesis**

The hypothesis comes from the Lathin language namely Hipo which means temporary and thesis which means statement or theory.

Hypotheses are temporary statements that must be tested for truth.

Kerlinger, 1998, says that a hypothesis is an estimate of the relationship between two or more variables.

In this study may be explained that the hypothesis of the research is as follows: "There are Bleep Test Method Effect Against Blood Glucose".

**9. Research Methodology**

To facilitate a person in conducting research, a researcher must be guided by research methods so that they can facilitate and complete the research being carried out.

The research method is a method or system that must be done in collecting data used in research in order to find answers to the problems being studied.

**9.1 Research Place**

In this study, which was used as a place of research was the Faculty of Ilmu Keolahragaan, Medan State University.

Data taken using research instruments and then must be tested again to see the validity and reliability.

**9.2 Research Time**

This research was conducted for 4 months starting from December 2018 to March 2019.

**9.3 Research Variable**

The research variable is the object or the focus of research. (Suharsimi Arikunto, 1992).

In this study, the research variables are Bleep Test (X) and Blood Glucose (Y).

**9.4 Population and Samples**

Population is a group or individual that can be observed as an object of research to reveal existing problems.

According to Sugiyono, 2013, said that the population is a region of generalization consisting of objects / subjects that have certain qualities and quantities as well as certain characteristics determined by researchers to be studied and then conclusions drawn.

In this study the study population was students of the Faculty of Ilmu Keolahragaan, Medan State University.

After students of the Faculty of Ilmu Keolahragaan, Medan State University were made as the subject of the study, then the next sample was taken to represent the entire population.

The sample is part of the population that is the actual data source in one study. (Sugiyono, 2013).

Then Suharisimi Arikunto, 2002, said that the sample was partially or representative of the population studied.

As respondents in this study were a total of 17 people and overall as a sample in random sampling.

**9.5 Data collection technique**

The data used in the study is qualitative data that is used by collecting data using a tool that is related to the research.

**9.6 Data analysis techniques**

In using the data in this study, the data is primary data, namely data that is directly obtained from the object of research, namely students of the Faculty of Ilmu Keolahragaan, Medan State University (UNIMED).

This type of research is descriptive, which is aimed at explaining the problems being studied.

According to Rahmat, 2015, saying that descriptive research is research used to examine the condition of natural objects as opposed to experiments where researchers is a key instrument.

The data obtained in the study were data on blood glucose levels and cardiovascular endurance:

1. Measurement of blood glucose level data using Aesitoc Meter with information:

- a. The goal is to measure blood glucose levels.
- b. Tools are aesitoc (pocket), strips, lancets and alcohol wipes.
- c. Implementation:
  - a. Tastee we first take the blood by using a lancet on one of the fingertips.
  - b. Then the streep that has been inserted into aesitoc (pocket) is touched by the tip to the blood that comes out at the tip of the finger.
  - c. Then the value automatically appears in the aesitoc (pocket) tool.
  - d. The value that appears is tastee blood glucose level.
  - d. After there is value, clean the blood on the fingertips using alcohol wipes.

**10. Results and Discussion**

In this study what you want to see is how the effect of the Bleep Test on the fitness of the human body so that an amnesty can still maintain his body condition so that he is always fit and protected from various diseases.

Respondents who were the object of research here were 17 students from the Faculty of Ilmu Keolahragaan, State University in Medan, who were taken by random sampling.

Before the participants were told to run, blood glucose checks were carried out on all participants and overall glucose examination data were recorded based on the results of blood glucose examination. Then after participants completed the run with a number of different rounds, then carried back in blood glucose tests to all participants run and then recorded one after the results of blood glucose tests for all participants.

**10.1 Descriptive analysis**

Data collected by researchers through data collection in the field such as: data on blood glucose before exercise and data on blood glucose after doing the overall exercise will be able to provide a general explanation of the implementation of this study called descriptive data.

Overall data collected based on blood glucose examination before exercise and after exercise can be explored through the table below:

**Table 6:** Descriptive data on blood glukosa

N	Glucose Examination	Min	Max	Mean	Var
17	Before	75	143	1.017	0.01
17	After	81	154	1,121	0,99

Sources: Processed Data, 2019.

**Based on table 6 an explanation can be given as follows:**

1. Examination of blood glucose before the exercise of all participants can be explained that the minimum blood glucose of the trainees is equal to 75, whereas after exercise the minimum blood glucose is 143.
2. Blood glucose examination after training all participants can be explained that the minimum blood glucose of the trainees is 81 and the maximum is 154.
3. The average blood glucose examination before exercise for all trainees was 101.76.
4. The average blood glucose examination after exercise for all trainees was 112.17.
5. The variant of blood glucose before the exercise of all the trainees with the Bleep Test was equal to 0.01.
6. The variant of blood glucose after exercise for all trainees with the Bleep Test is 0.99.

Then the Bleep Test results that have been performed on all participants who took the Bleep Test gave different results and the difference was caused by differences in the condition of each Bleep Test Test participant.

There are some things that can explain the difference in the results of the Bleep Test:

1. The condition of each human body that will take the Bleep Test.
2. The age of the Bleep Test participants is 18 years to 23 years.
3. The sex of participants in the Bleep Test is male.

Before doing the Bleep Test, all participants are collected and briefed by the trainer so that all participants understand the ways to take the Bleep Test to avoid mistakes, resulting in a difference in scores on the Bleep Test for all trainees or sports participants.

Bleep Test Test to find out the level of fitness of the human body (VO2Max) after doing motion exercises or exercising from all trainees or sports participants as many as 17 people.

Based on the test results Bleep Test done to all the trainees then obtained as follows:

**Table 7:** Results test bleep test for exercise level level

No	Name	Level
1.	Edu	4
2.	Dedi Rosadi	8
3.	Musbar Anggara	11
4.	Liber	6
5.	Noval	4
6.	Jefri	4
7.	Putra	4
8.	Aji	4
9.	Khairul	6
10.	Andika	7
11.	Gaga Pratama	8
12.	Reski	7
13.	Daulat Abd. Rahman	7
14.	Gupman	4
15.	Amar	10
16.	Daniel	8
17.	Baginda	10
	Average	6,58

Based on the results of the Bleep Test for all trainees by following the procedure for implementing the Bleep Test starting from level 1 to the next level where the lowest level is level 4 and the average is level 6.58 and the highest level is

level 11 which can be explained as follows:

1. Participants who get the lowest level, level 4, are obtained by the trainees as many as 6 or 35.2%.
2. Participants who get level 6 as many as 2 people or 11.7%.
3. Participants who get a level above the average (6.58), namely level 7 as many as 3 or 17.6%.
4. Participants who get level 8 as many as 3 or 17.6%.
5. Participants who get level 10 as many as 2 or 11.7%.
6. Participants who get level 11 as many as 1 or 5.8%.

Based on the data, it can be concluded that participants who get running levels are below the average (level 4 as many as 6 people and level 6 as many as 2 people) is equal to 47.05% and participants who get the level run above the average (level 7 as many as 3 people, level 8 as many as 3 people, level 10 as many as 2 people and level 11 as many as 1 person) amounted to 52.95%.

Then, based on the implementation of Bleep Test Test has been done it can be explained that of the total participants Bleep Test Test results can be grouped into two groups of poor and good group that can be explained in the following table:

**Table 8:** Physical Fitness Group Respondents

No	Description	N	%
1.	Good Group	9	0,53
2	Not Group	8	0,47
	Total	17	100

Sources: Processed Data, 2019.

**10.2 Effect of bleep test on blood glucose**

In a healthy body, adequate O2 is needed so that it can affect human body movements to be smooth where this is caused by smooth circulation of blood flowing throughout the human body. VO2Max is a condition of the human body's resistance to using oxygen during human activities in a maximum state where the energy supply that comes from maximum training will produce Vo2Max to the fullest.

In the development of sports science, the Bleep Test can be done using computer media with the Bleep Test software that is software that functions as a computerized application that can facilitate guiding the testing process in a team by producing more effective recording and acting as an intermediary between the tester and the test to carry out activities with commands that must be done in computer software. The results of the study explain that the Bleep Test software can function properly according to the rules of the Bleep Test. (F, A, & Y, 2016).

Bleep Test Tests that have been carried out have an influence on the condition of human blood glucose which can be known from blood glucose examination before it is done and blood glucose examination after the Bleep Test is performed on all participants.

Then we can determine the average blood glucose condition Bleep Test Test participants before and after the test Bleep Test which can be explained in the following table:

**Table 9:** Comparative average blood glucose before and after test bleep test

	Before	After	
Average	Sd	Average	Sd
101,76	18,14	112, 17	19,49

Sources: Processed Data, 2019.

Before the Bleep Test, all participants were examined for blood glucose and received various results that were in accordance with the physical condition of each participant and so after the Bleep Test, blood glucose was checked for all participants.

It can be known based on blood glucose examination before the Bleep Test is conducted that the participants' blood glucose average is 101, 76 with Std. Deviation is 18.14. Then after the Bleep Test the participants performed a blood glucose examination with an average yield of 112, 17 with Std. Deviation of 19.49.

Based on the results of blood glucose tests to all participants prior to the exercise test Bleep Test, it is known that there are two (2) groups of blood glucose result is less good group and a good group that can be explained in the following table:

**Table 10:** Blood glucose averages for groups blood glucose test results before bleep test

No	Description	N	Average
1.	Good Group	9	115,77
2.	Poor Groups	8	86
		17	

Sources: Processed Data, 2019.

The blood glucose conditions of the Bleep Test participants who were in a good group were the blood glucose conditions above the average of all Bleep Test Test participants as many as 17 where the overall blood glucose average was 101.76.

Participants in the Bleep Test who received blood glucose conditions above 101.76 as many as 9 were called good groups.

Then the average blood glucose group taken by 9 people was 115.77.

Then for the poor group there were 8 people whose blood glucose values were below the overall blood glucose level of participants as much as 101.76.

The average blood glucose level of the Bleep Test participants who entered the poor group was 8 people at 86.

Then after the Bleep Test was carried out the blood glucose examination was carried out for all participants, there were 2 (two) groups of blood glucose test results, namely the good group, which was above the participants' blood glucose condition, which was 112.17 as many as 8 and the group was less well below the average blood glucose conditions of participants were 112, 17 as many as 9 which can be explained in the table below:

**Table 11:** Average blood glucose to a group of blood glucose test after test bleep

NO	Description	N	Average
1.	Good Group	8	128,5
2.	Poor Groups	9	97,67
		17	

Sources: Processed Data, 2019

Based on the table above, it can be explained that the average blood glucose level of the Bleep Test participants was 8 people in the good group at 128.5 and in the poor group it was 97.67.

Then based on the processed data using SPSS version 20, it can be seen that tcount is 0.674 or 67.4% means that the effect of the Bleep Test affects blood glucose after running exercises.

The results obtained based on processed data using SPSS

version 20 where the influence of the Bleep Test on Blood Glucose has an effect of 67.4 and the remaining 32.6% is a little effect on blood glucose and some have no effect at all.

Then the results of the study (Abdurrahman, 2018), said that the increase in VO2Max did not increase sugar levels before and after the Bleep Test where each group was given training and sugar intake for 1 week before the Bleep Test was conducted.

Auliya, Oenzil & Rofinda, 2016, explained that the results of research that had been conducted that increased sugar levels were higher in students who had mild physical activity compared to students who had moderate or severe physical activity.

Warsono, Widodo & Kumaidah, 2017, also explained that someone who does physical activity regularly will get a high level of physical fitness and the effect of physical fitness will affect the functioning of the respiratory system, one of which is VO2Max.

The results of this study also coincide with the opinion of Pratanandi, 2012, who said that the cause of high VO2Max is determined by several factors including:

1. Vital Capacity and Quality of Lung Diffusion where if the lung volume gets higher it will facilitate blood (hb) to bind oxygen and release carbon dioxide to the lungs.
2. Hb levels that can act as a binder of oxygen that is distributed to tissues throughout the body. (For male athletes Hb 16 gr% and female sportsmen 14%).
3. Quality and Quantity of Blood Vessels where clean blood vessels will make it easier for blood to circulate in the human body in a routine manner.
4. Heart Quality where volumen of a large heart rate is caused by a large volume or space in the atrium or ventricle of the heart.
5. The number and magnitude of mitochondria as a place for the ongoing Krebs cycle and electron transport system or oxidative possporilation. If the greater mitochondria in each muscle cell will result in the use of oxygen to make Adenosine Triphospate (ATP) higher where the muscle cells will be higher (for runners the front thigh calf muscles, for swimmers in the chest and buttock muscle cells)
6. Increased body weight caused by fat reserves in adipose cells, muscle glycogen and enlarged and compressed bone will reduce VO2Max.

Erina Laila Putri research, in 2016, also said that the results of Chi Square test with 3 x 2 contingency table explained that the intensity of physical exercise is closely linked with a mean random blood glucose in patients with diabetes mellitus.

## 11. Conclusions and Suggestions

### 11.1 Conclusion

Based on the results of research that began with the phenomenon that occurs then searched and studied the existing problems and is supported by terori and the data it can be concluded as follows:

1. The results of blood glucose tests before and after the test Bleep Test differ significantly from the standard deviation.
2. After the Bleep Test Test then performed again there are significant blood glucose measurement test Bleep Test against human blood glucose by 67.4%.

### 11.2 Suggestion

1. Test Bleep Test is to be prepared prior to testing.

2. Respondents were used as a sample in this study must first be selected so that the participants really ready to perform the test Bleep Test so there creates a different result.
3. Respondents were used as a sample to be treated equally regarding food, drink and rest so that the same is expected to produce the same effect.

## 12. References

1. Aerobic Versus Anaerobic. Doctor Senior Exercise [homepage on the Internet]. Nodate [cited 2012 Nov 02]. Available from URL: <http://doctors-exercise.com/journal/aerobic.htm>.
2. American Diabetes Association. Diabetes Basics [homepage on the Internet]. Nodate [cited 2012 Nov 02]. Available from URL: <http://www.diabetes.org/diabetes-basics/type-2/>.
3. Arikunto, Suharsimi. *Prosedur Penelitian Suatu Pendekatan Praktek*, Penerbit Rineka Cipta, Jakarta, 2006.
4. Article Literature Review (PDF Available) in *Journal of sports science & medicine*. 2016; 14(3):536-47.
5. Brewer J, Ramsbottom R, William C. *Multistage Fitness Test: A Progressive Shuttle- Run for the Prediction of Maximum Oxygen Uptake*, Belconnen, ACT, Australian Coaching Council, 1998.
6. Erina Laila Putri. Hubungan Antara Pelatihan Jasmani Dengan Kadar Glukosa Darah Pada Penderita Diabetes, *Jurnal Berkala Epidemiologi*, 2016, 4(2).
7. Fauzan AF, Rusdiana A, Ruhayati Y. *Jurnal Terapan Ilmu Keolahragaan*, 2016, 1(1).
8. Guntur. Peranan Pendekatan Andragogis Dalam pembelajaran Pendidikan Jasmani, *Jurnal Pendidikan Jasmani Indonesia*, 2009, 6(2).
9. Guyton AC, Hall JE, Alih Bahasa, Irawati, Irawati setiawan. *Buku ajar Fisiologi Kedokteran*. Ed 9. Jakarta: Penerbit Buku Kedokteran EGC, 1997, 1333-372.
10. Irianto Djoko Pekiki. *Pedoman Praktis Berolahraga Untuk Kebugaran dan Kesehatan*, Penerbit Andi, Yogyakarta, 2004.
11. Kerlinger F. *Asas-Asas Penelitian Behavioral*, Diterjemahkan Landung R, Simatupang, Penerbit Gadjah Mada University, Yogyakarta, 1996.
12. Lumban Raja, Togu Melva Sitanggang. *Metodologi Penelitian*, Penerbit CV. Indah Karunia Jaya, Medan, 2011.
13. Lutan Rusli DKK. *Pendidikan Kebugaran Jasmani*, Depdiknas Dirjen Pendidikan Dasar dan Menengah, Jakarta, 2001.
14. Mahardika I, Made Sriundy. *Pengantar Evaluasi Pengajaran*, Unesa University Press, Surabaya, 2010.
15. Muhammad Neufal Abdurrahman. *Jurnal Terapan Ilmu Kedokteran*, 2018, 3(1).
16. Nurhadi Santoso. *Pendidikan Jasmani di Sekolah menengah Atas : Antara Harapan Dan Kenyataan*, *Jurnal Pendidikan Jasmani Indonesia*, 2009, 6(2).
17. Nurhasan. *Tips Praktis Menjaga Kebugaran Jasmani*, Penerbit Abil Pustaka, Gresik, 2011.
18. Ocky Dermawan Yudha Hari Warsono, Sumardi Widodo, Endang Kumaidah, *Jurnal Kedokteran Diponegoro*, 2017, 6(2).
19. Putri Auliya, Fadil Oenzil, Zelly Dia Rofinda. *Jurnal Kesehatan Andalas*, 2016, 5(3).
20. Rahmat W. *Bahasa Ancaman Dalam Teks Kaba Sabai Nan Aluih Berbasis Pendekatan Linguistik Forensik*, *Jurnal Arbiter*, 2015, 2.
21. Sastropanoelar Sudarno. *Pendidikan Kesegaran Jasmani*, Departemen Pendidikan Dan Kebudayaan Direktorat Jenderal Pendidikan Tenaga Kependidikan, Jakarta, 1992.
22. Sigal RJ, Kenny GP, Wasserman DH. *Physical Activity/ Exercise And Types 2 Diabetes*, *Jurnal Diabetes Care*. 2006; 26(6):1433-38.
23. Smith Melisa Diane. *User Guide To Preventing & Reversing Diabetes Naturally*, PT. Buana Ilmu Populer, Jakarta, 2003.
24. Sugiyono. *Cara Mudah Menyusun Skripsi, Tesis, dan Disertasi*, Penerbit Alfabeta, Bandung, 2013.
25. Uma Sekaran. *Metodologi Penelitian Untuk Bisnis*, Penerbit Salemba Empat, Jakarta, 2009. [www.hedisasrawan.blogspot.com/2015/11/7-fungsi-jantung-manusia.html](http://www.hedisasrawan.blogspot.com/2015/11/7-fungsi-jantung-manusia.html).