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**THE EFFECTS MOVING UP AND DOWN THE BENCH AT NIGHT FOR  
20 MINUTES ON DECREASE BLOOD SUGAR LEVELS OF SMAN 12  
TANGERANG STUDENTS**

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**Abstract**

*This study aims to determine the effect of work up and down the bench at night. Subjects in this study are students of SMAN 12 Tangerang totaling 25 people, clinical trial research with research design "One Group Pre-test and Post-test Design". The measured Parameter is the blood glucose level. The results obtained pre-test and post-test glucose levels after doing activities up and down the bench. The data analysis technique used is the T-test technique (t-test) by calculating the value of t-count compared to the T-table at degrees of freedom n-1 and the level of significance (p<0.05). From the results of research on the activity of the effects of work up and down the bench at night for 20 minutes, obtained the average value of pre-test blood sugar levels is 114.8 and the average post-test is 97.6. The value of the difference between pre-test and post-test is 17.2. Conclusion activity up and down the bench at night for 20 minutes affects a significant decrease in blood sugar levels and is easy to do.*

**Keywords:** *Up and down the bench; nighttime activity; blood sugar levels.*

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## INTRODUCTION

According to (Anton Mulyono, 2001) activity means activity or activeness so everything that is done or activities that occur both physical and non-physical is an activity. According to Rochman Natawijaya in (Mone, 2005) activity is an activity carried out to produce changes in knowledge values attitudes and skills in students as an exercise that is carried out intentionally. Activity also requires good food and drink intake.

According to Srikandi in (Zentalian, 2014), the problem of hawker food in Indonesia Umm happened because of its unhygienic processing and presentation.

It is usually produced and sold in unfavorable conditions so that it is often contaminated by microorganisms and this can cause various diseases. Some of the most common types of degenerative diseases are cancer, diabetes, Parkinson's, Alzheimer's, rheumatoid arthritis, and osteoporosis. Therefore, students know good snacks and activities to keep the body healthy, especially with limited student activities to exercise with a solid time from school. One activity that can be done easily is up and down the bench.

(Baharuddin, 2009) revealed that Full day school is an all-day school, or teaching and learning process that is carried out from 06.45-15.00 with a duration of rest every two hours. Permendikbud number 36 of 2018 the number of hours of physical education lesson in one week is only 3 hours of lessons. With little activity and there is still eating unhygienic snacks. This condition can increase the risk of developing degenerative diseases.

According to (Nurhasan, 2001), activity up and down the bench is done aimed at increasing the element of speed and strength in physical condition. Because the elements of speed and strength are fundamental parts of endurance. Endurance is the ability of a person to perform activities for a long time, if you have good endurance. Then you can do long activities without experiencing fatigue, meaning if you quickly feel tired in doing every activity, it's because you don't have good endurance exercise up and down the bench aims to train the endurance of quadriceps muscle strength and also aerobic endurance in the human body.

At the time of physical activity, the body will experience physiological effects in the form of fatigue due to lack of energy supply in the form of glucose to the part of the body that is active. As a result, the body cannot do its job optimally. Some of the physiological responses that occur during fatigue are increased amounts of lactic acid in the blood. While other biological responses are the occurrence of decreased blood glucose levels and increased metabolism of anaerobic and aerobic glycolysis. The increase in aerobic and anaerobic glycolysis

can be measured by the magnitude of the decrease in blood glucose levels and the increase in lactic acid levels. (Harsono, 1993) also in his book “Principles of training” said that the duration of exercise for Health Sports and someone who is not an athlete between 20-30 minutes.

This Bench up and down exercise aims to measure the body's general capacity to adjust to heavy work and recover from the task. This test is reserved for adult males and with some changes. The test can also be used for high school students, female students, female high school students and male and female elementary school students. This test is also to measure general physical fitness for heavy work by going up and down the bench 30 times per minute for 5 minutes. (Moeslim, M., et al, 1978) The test lasts for 5 minutes with a stop sign given. If it is no longer possible to do the test can stop, then sit down and the supervisor will count his pulse. After the signal “stop” is given, immediately sitting on a bench. After 45 seconds of sitting, the pulse counter is ready to do its job which starts right after 1 minute of rest.

The work Program up and down the bench for 20 minutes is as follows :

According to (Sadoso Sumosardjuno, 1986) heating is very important, meaning that for physical performers who require peak ability in a short time, the effect of temperature increase in the body at the time of heating is more important, meaning than the rapid increase in heating and circulatory system and also more important than the increase in hormones.

- a) Initial a gesture standing upright position facing the bench/chair.
- b) After hearing the starting signal from the researcher, one of the legs is raised to the bench/ chair, then followed by rising the leg that has not been raised to the top of the bench/chair.
- c) The legs are lowered alternately, the body position remains upright.
- d) Do repeated exercises up and down the bench for 20 minutes with the appropriate rules of procedure.

Physical activity is the movement of the body produced by skeletal muscles that require energy expenditure (WHO, 2011). Physical activity will provide oxygen and nutrients to all cells and tissues of the body. According to the Ministry of (Health, 2006) regular physical activity has a beneficial effect on health, namely, avoiding disease, weight control, more flexible muscles, and stronger bones, and more confident of course the body becomes energetic and fit. The overall state of Health is getting better.

William F. (Ganong, 2001) in his book “textbook of Medical Physiology” in the morning high oxygen pressure and high blood acidity, and the ability of hemoglobin to bind oxygen increases, while at night the conditions of low oxygen pressure and low acidity that cause the ability of hemoglobin to bind oxygen decreases.

Plants mark the beginning of the oxygen cycle. Plants can use the energy of sunlight to convert carbon dioxide and water into carbohydrates and oxygen in a process called photosynthesis. During the day, plants hold onto the little oxygen produced in photosynthesis and use that oxygen to break down carbohydrates. However, to maintain metabolism and continue respiration during the night, plants must absorb oxygen from the air and release carbon dioxide like animals. Glucose is the precursor for the synthesis of all other carbohydrates in the body such as glycogen, ribose, deoxiribose in nucleic acids, galactose in milk lactose, glycolipids, glycoproteins and proteoglycans (Murray et al., 2003).

## METHOD

The main purpose of this study was to determine the effect of activity up and down the bench on blood sugar. This research conducted using experimental methods with research design one groups pretest and post-test design.

### Sampling Procedures

(Suharsimi, 2010) population is the whole subject of research. Population research can only be done for a finite population and not too many subjects. In this study the technique used in sampling is purposive sampling where researchers

have certain considerations in sampling or for a specific purpose (Riduwan 2010).

In this study the population is SMAN 12 Tangerang students totalling 288 people.

The stages of sampling with the following criteria:

1. Male
2. Age 15-17 years
3. Follow extracurricular activities
4. Male students of SMAN 12 Tangerang
5. Following the test up and down the bench for 2 Sets x 5 minutes, 25 students with the highest scores will be sampled.

Sampling criteria fail when :

1. Did not reach the specified time limit.
2. Injury occurred during the study.

### **Materials and Apparatus**

The instrument used to collect data in this study is to use the measurement of the decrease in blood sugar levels in students of SMAN 12 Tangerang before and after exercise up and down the bench for 20 minutes at night using a glucometer and other supporting tools such as alcohol swabs, stopwatch, blood strips, lancet, metronome, bench with a height of 30 cm, and pluit.

### **Procedures**

In this study conducted by taking the data pre-test and post-test on the research sample. (pre-test) is done by measuring blood sugar levels before the sample doing activities up and down the bench for 20 minutes at night, so it is known that there will be a significant effect when later followed by the post-test (post-test), namely measuring blood sugar levels after the sample doing exercise activities up and down the bench. After the two data were obtained, namely pre-test and post-test, the two data were set aside so that the effects that occurred due to the activities carried out by all samples could be seen.

## RESULT AND DISCUSSION

Description the data in this study include the highest value, average value, standard deviation, standard error, frequency distribution, and histogram of each variable, the following complete data :

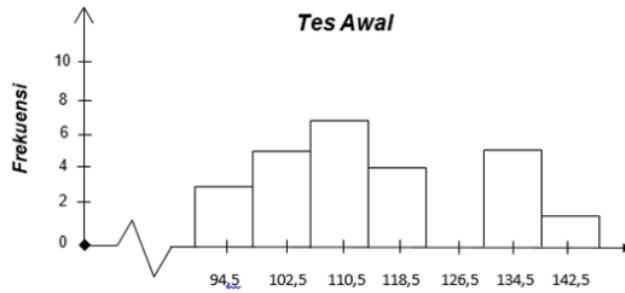
**Table 1.** Description of pre-test and post-test data up and down the bench at night for 20 minutes

Variable	Pre-test (mg/dL)	Post-test (mg/dL)
High Value	139	124
Low Value	91	72
Average	114,8	97,6
Standard Deviation	13,60	14,33
Standard error	2,78	2,92

Data collected on the decrease in blood sugar levels before doing activities up and down the bench at night in the pre-test showed the highest value range of 139 mg/dL and the lowest value of 91 mg/dL with an average blood sugar level of 114.8 mg / dL. Standard deviation (SD) of 13.60 and standard error (SE) of 2.78. This can be seen in the frequency distribution and Histogram graph as follows:

**Table 2.** Frequency distribution before doing activities up and down the bench at night for 20 minutes

Interval Classes	Median	Frequency (Fi)	Relative Frequency / Percentage
91 - 98	94,5	3	12%
99 - 106	102,5	5	20%
107 - 114	110,5	7	28%
115 - 122	118,5	4	16%
123 - 130	126,5	0	0%
131 - 138	134,5	5	20%
139 - 146	142,5	1	4%
<b>Total</b>	100%	25	100%



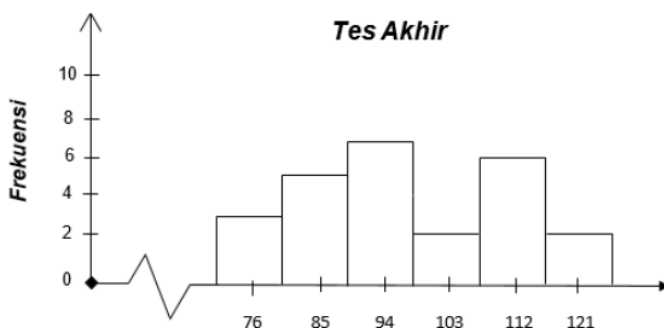
**Figure 1.** Histogram graph frequency before doing activity up and down bench at night for 20 minutes

Data collected on the decrease in blood sugar levels after doing activities up and down bench at night found the results in the post-test showed the highest value of 124 mg/dL and the lowest value of 72 mg/dL with an average blood sugar levels after doing activities up and down bench at night of 97.6. Standard deviation (SD) of 14.33 and standard error (SE) of 2.92. This can be seen in the frequency distribution and Histogram graph as follows:

**Table 3.** Frequency distribution before doing activity up and down the bench at night for 20 minutes

Interval Classes	Median	Frequency (Fi)	Relative Frequency / Percentage
72 – 80	76	3	12%
81 – 89	85	5	20%
90 – 98	94	7	28%
99 – 107	103	2	8%
108 – 116	112	6	24%
117 - 125	121	2	8
Total	100%	25	100%





**Figure 2.** Histogram graph frequency before doing activity up and down bench at night for 20 minutes

## Discussion

Delivered the average value and the results obtained before doing activities up and down the bench at night for 20 minutes is equal to 114.8 mg/dL and the post-test of 97.6 mg/dL. From the data after doing activity up and down the bench at night for 20 minutes on average about the pre-test and post-test results on blood sugar levels indicate a change in blood sugar levels. From the results of data analysis obtained the average difference (MD) 17.36 with the standard deviation difference. Delivered the average value and the results obtained before doing activities up and down the bench at night for 20 minutes is equal to 114.8 mg/dL and the post-test of 97.6 mg/dL. From the data after doing activities up and down the bench at night for 20 minutes on average about the pre-test and post-test results on blood sugar levels indicate a change in blood sugar levels. From the results of data analysis obtained the average difference (MD) 17.36 with the standard deviation of the average difference (SDD) is equal to 8.39 and the standard error of the average difference (SEM\_D) of 1.71 in the next calculation obtained t-count value of 10.15 and the value of t-table with degrees of freedom (dk) =  $n-1 = 25-1 = 24$  table (t-count = 10,15 > t-table 2,06).

Based on the analysis of these data can be concluded Nihil hypothesis ( $H_0$ ) is rejected, alternative hypothesis ( $H_1$ ) is accepted, means doing activities up and down the bench at night for 20 minutes affect the decrease in blood sugar levels in students of SMAN 12 Tangerang.

## CONCLUSION

Activity up and down the bench effectively lowers blood sugar levels both in the morning and at night. Activity up and down this bench can be done at home, for those who have limited land and limited time. Activity up and down the bench for 20 minutes can be an alternative for someone to move the body to be healthy and can lower blood sugar levels for diabetics.

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The Effects Moving Up And Down The Bench At Night For 20 Minutes On Decrease Blood Sugar  
Levels Of Sman 12 Tangerang Students

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