

Blood Glucose Levels in Students with Stress

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Abstract: Stress can occur at any lecture level, especially at the initial level. This is in line with previous research which states that, there is increased stress in the first-year students due to changes in learning systems in previous education. The purpose of this research is to know the blood glucose level on students with stress. The type of this research is descriptive using cross sectional design, as many as 24 respondents. Based on levels of glucose to stress levels, the normal group (without stress), whole blood glucose levels within normal limits (100%) ie 7 of 7 respondents. For the mild stress group, there was a normal glucose level of 11 people (78.5%) and high glucose level of 3 people (21.4%). In the moderate group, 3 respondents had high blood glucose level (75%) and only 1 respondent had blood glucose level in normal range (25%). While in the heavy stress group found all respondents with high blood glucose levels (100%). Conclusion, the highest stress level found was mild stress and the highest blood glucose levels were found to be normal glucose levels.

1 INTRODUCTION

Stress is a condition caused by transactions between individuals and the environment that leads to a perception of the distance between the demands derived from the situation with the resources in the biological, psychological and social systems of a person. Stress occurs due to unbalanced between the desired expectations of individuals with events that occur, both physical and spiritual desires. (Sukadiyanto, 2010) The incidence of stress is still high and varies greatly in various groups in Indonesia. The results of basic health research (Riskesdas) in 2007 showed that 11.6% of Indonesians aged 15 years and over experienced an emotional mental disorder. At Riskesdas in 2013, that figure shows a decline to 6%. The results of the study at the assembly taklim in South Jakarta showed that the prevalence of stress reached 13.3%. (Besral, et al, 2015)

Holahan mentioned the type of stress that is divided into two parts, namely Systemic stress and Psychological stress. Systemic stress is defined as a non-specific response of the body to the demands of the environment. Psychological Stress occurs when individuals encounter stressful environmental conditions as a threat that strongly challenges or exceeds their coping ability. (Noviyan M, 2007)

There are other things that can trigger stress, such as feelings of anxiety about the outcomes

achieved, unbalanced activity, self-stress, a condition of uncertainty, anxiety, guilt, an emotionally thirsty soul, and socioeconomic conditions. According to Subramanian, in Student there are many other factors that can also trigger stress, such as: environment, academic, work competition, interpersonal relationship, and way of thinking of student also can make stress to student. Usually if students experience stress will arise such as: feeling of solitude, lack of sleep, anxiety, and high hesitations. And if this stress continues to have a negative effect on health, personality, social interaction and academic achievement of students. (Subramaniam V, 2010, Pathmanathan V, et al, 2013)

Stress can occur at any lecture level, especially at the initial level. This is in line with previous research which states that, there is increased stress in the first-year students due to changes in learning systems in previous education. (Pathmanathan V, et al, 2013, Mahfar M, et al, 2007)

Continuous stress can affect stress hormones. Adrenaline, cortisol which is a stress hormone will rise in number and will affect the homeostasis system. The hormone affects the sympathetic nervous system and raises the heart rate and blood pressure. This is in accordance with subramaniam research which states that, there is a stress relationship on Students with high blood pressure at the time of the exam. In addition, cortisol has a metabolic effect that increases blood glucose

concentration by using protein and fat stores. So there is an increase in stored glucose, amino acids, and fatty acids available for use when necessary, for example under stress. (Kadir A, 2010)

Glucose is one of the simplest monosaccharides that has the C₆H₁₂O₆ molecular formula. Glucose serves as the fuel of most living things. The breakdown of carbohydrates produces monosaccharides and disaccharides, with the greatest result being glucose. Through glycolysis and the citric acid cycle, glucose is oxidized to form CO₂ and water, producing an energy source in the form of ATP. (Ekawati ER, 2012)

Normal levels of glucose in blood are <126mmHg at the time of fasting and <200mmHg add random glucose levels. If there is an increase in blood sugar levels in the body, it is called hyperglycemia. If the state of hyperglycemia is very dangerous for the body. Has symptoms of polyphagia, polydipsia, weight loss, polyuria and other symptoms. The state of chronic hyperglycemia can cause damage to organs, especially the eyes, kidneys, heart, nerves and blood vessels. (Suci M, 2015)

2 METHOD

The type of this research is analytic descriptive by using cross sectional design. Cross-sectional research is an option because the study was conducted at one time and only one time, no follow-up. This research was conducted in April 2017 until December 2017 and the location of the research was conducted at the Faculty of Medicine, University of Muhammadiyah Sumatera Utara. Population is the whole of all variables concerning the problem under study. The population of the research is the medical faculty students of University of Muhammadiyah Sumatera Utara in the first semester of academic year 2017 - 2018 who will take the test. The sample assessed in this research is the medical faculty students of University of Muhammadiyah Sumatera Utara who are included in the inclusion criteria. The number of samples required in this study was 24 people. The last step of this research is to analyze data. Data analysis is done gradually and done through computerization process. This study used univariate analysis. This analysis is used to provide an overview of the research data. The data will be presented in the form of descriptive statistics.

3 RESULT

The gender characteristics of the respondents consisted of the same two groups between the 12 men (50%) and the 12 women group (50%).

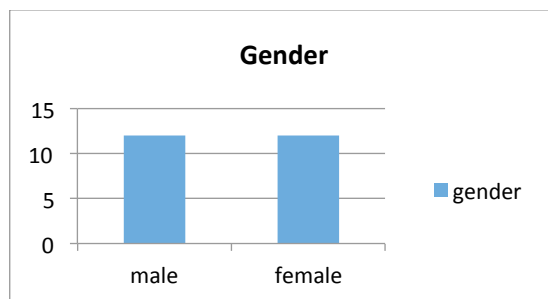


Figure 1. Characteristic of gender

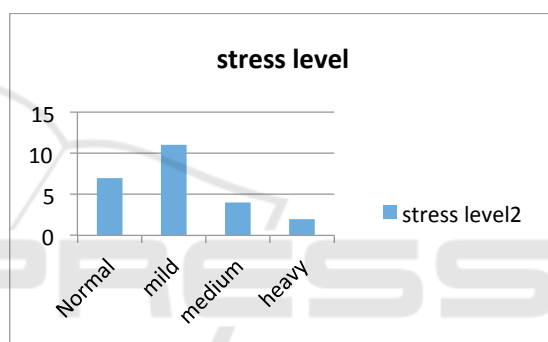


Figure 2. Characteristic of stress level

Characteristic of stress level, it was found that there were 4 stress level on respondent with the most group in mild stress group were 11 people (46%), normal group with 7 people (29%), medium stress group with 4 people (17%) and smallest group on the heavy stress of 2 people (8%).

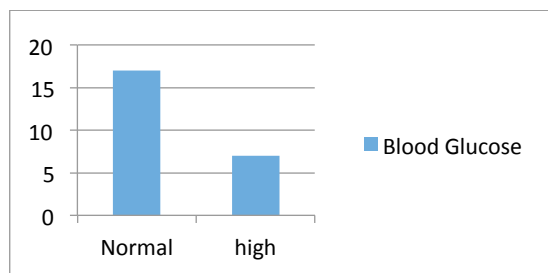


Figure 3. Characteristic of blood glucose

The characteristic of glucose content of the respondents was found in the group with normal glucose level as many as 16 respondents (66.67%) and then group with high glucose level as many as 8 respondents (33.33%).

Table 1. Characteristic of stress levels and blood glucose

Blood Glucose	Stress Level								Total
	Normal		Mild		Medium		Heavy		
	n	%	n	%	n	%	n	%	
Normal	7	100	8	72,7	1	25	0	0	16
High	0	0	3	27,3	3	75	2	100	8
Total	7	100	11	100	4	100	2	100	24

In the normal group all blood glucose levels within normal limits (100%) ie 7 of 7 respondents. In the mild stress group, there was a normal glucose level of 11 people (78.5%) and high glucose level of 3 people (21.4%). In the moderate group, 3 respondents had high blood glucose level (75%) and only 1 respondent had blood glucose level in normal range (25%). While in the heavy stress group found all respondents with high blood glucose levels (100%).

4 DISCUSSION

Based on the results of research conducted on 24 students semester 1 FK UMSU, it is known that as many as 17 people (70.8%) who experience stress in various levels. This is in line with research conducted by Veyna (2013) shows that almost half of the number of initial students respondents who studied in medical school Sam Ratulangi Manado experiencing stress that is as much as 48.4%. (Talumewo VR, et al, 2013) Students of Medical Faculty UMSU first semester experience the most mild stress, is 11 people (46%), who experienced moderate stress as many as 4 people (17%) and heavy stress as much as 2 people (8%). The same study conducted in Iran on medical faculty students and the results obtained is 26.22% is mild stress, 20.5% simple stress and 14.75% are high stress. (Marjani A, et al, 2008) Students who will take the exam will raising the level of stressornya, especially academic stressors. This is consistent with Lal's study that academic pressures such as exams can add to stressful academic stress.¹² This is also supported by research by Virginia (1999) in Farida (2008) that academic problems are a contributing factor to stress the largest in medical students. (Farida A, 2008, Legiran, et al, 2015) In addition, the target achievement of values and academic achievement also contributes to the potential causes of stress in

medical students. Research conducted by Yee (2013) also shows that academic achievement is very influential on the incidence of stress in medical students. (Yee L Y, 2013) Although in this study is not described in detail the causes of stress on students but stress levels are identified based on attitudes and emotions samples assessed using a DASS 24 questionnaire.

Stress not only affects a person's mental but also affects the metabolic process in a person's body, one of his blood sugar levels. (Djakani H, et al, 2013) In this study found that the higher the level of stress a person, the higher the percentage also increase in blood glucose levels. This is in line with research conducted by Pratiwi. Stress can increase blood glucose content because stress stimulates endocrine organs to release ephinephrine. (Pratiwi P, et al, 2014, PEI, 2015) Another study was also conducted on "Correlation of stress levels with elevated blood sugar levels. This study suggests that there is a relationship between stress levels and elevated blood sugar levels. (Juwita, 2008) The results of the study are consistent with the results of the current study, which is an overview of elevated blood glucose levels in stressful situations.

5 CONCLUSIONS

Based on the results of the research it can be taken some conclusions as most blood glucose levels in the samples obtained were normal blood glucose levels of 17 people. The highest level of stress found in UMSU Medical Faculty students in the first semester who will undergo a block exam is a mild stress level of 11 people. The most common level of stress is an increase in blood glucose levels is a level of heavy stress with a percentage of 100% found an increase in blood glucose from all samples who have severe stress.

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