

Comparison Random Blood Sugar Level and Body Mass Index of New among New Medical Students at the USU Faculty of Medicine in 2018 at before and after First Initial Semester Lectures

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Abstract: Blood sugar level (BSL) is something that refers to the level of sugar concentration in the blood. BSL can be influenced by several factors such as age, hormones, emotions, stress, the amount and type of food consumed and physical activity. Blood sugar levels in the body are closely related to lifestyle namely dietary habit and physical activity. With low activity, it will happen the accumulation of calories and sugar in the body. Body Mass Index (BMI) is one method for measuring one's ideal body weight, by measuring body height and body weight. BMI is also influenced by dietary habit and physical activity. The lecture is one example of physical activity. Lectures using the CBEL method (Competency Based Education Lecture) are student-centered learning methods and it is expected that students can have individual skills in medical science. This research aimed to obtain data on the comparison of blood sugar levels and body mass index of new students in 2018 at the USU Faculty of Medicine before and after the initial semester lectures. This research was analytic observational with a cross-sectional design. The sample in this research was taken by simple random sampling technique. This research was calculated the number of subjects in the population than using the formula and randomly selected 97 samples. The collected data are primary data taken directly at the Faculty of Medicine. In this research were obtained significant results on blood sugar levels before and after the initial semester lecture with $p = 0.028$ ($p < 0.05$) and significant results on BMI before and after the initial semester lecture with a value of $p = 0.038$. There was a difference in the comparison of initial blood sugar levels and BMI before and after the initial semester lecture on new students of 2018 the USU Faculty of Medicine.

1 BACKGROUND

Blood sugar level (BSL?) is something that refers to the level of sugar concentration in the blood. According to PERKENI (Indonesian Endocrine Society) in 2015, initial blood sugar level BSL should be is normal if it is < 100 mg/dl and suspected Diabetes Mellitus if ≥ 200 mg/dl. Blood sugar level can be influenced by several factors such as age, hormones, emotions, stress, dietary habit and physical activity (Putra *et al.*, 2015).

Irregular dietary habit plus consuming foods that contain too much protein, fat and sugar and but less fiber will greatly contribute to increasing excess

body weight or obesity (Kasengke *et al.*, 2015). In Indonesia, limiting or monitoring one's ideal body weight can be determined based on the Body Mass Index (BMI) This method only applies to someone over 18 years old, by comparing between body weight and height. According to a study conducted by Kasengke *et al.* (2015) it was found in stated that a group of young adults aged 20-30 years old with BMI kg of 23kg/m² having initial BSL. Research conducted by Candrawati (2011) stated that found relation between physical activity with BMI which is 16.7% of overweight BMI was associated to low physical activity and 16.7% of obesity BMI was associated to low physical activity.

Faculty of Medicine of Universitas Sumatera Utara as one of Faculty of Medicine that implementing Competency-Based Curriculum (CBC) conducting in the system has a busy schedule from morning to evening. The curricula so encourage the possibility of an unhealthy dietary habit/lifestyle and will choose fast food as the main choice. This study aims the purpose of this research was to directly assess initial BSL and BMI the students of Medical Faculty related to the lecture process based on implementing CBC.

2 METHODS

This type of research is observational analytic research with a cross-sectional study. The research sample amounted and recruited 97 respondents based on using simple random sampling method which is choosing samples randomly using dice. Sampling is done by taking direct BSL data then measuring body weight and height after the sample signing informed consent.

The BSL measurement uses a blood sugar glucose meter and BMI measurement using weight formula in kilograms (kg) divided by height in meters squared (m²). In this research the BMI classification using the Asia-Pacific criteria (reference).

3 RESULTS AND DISCUSSION

In this study, the respondents (research subject) were new students of the USU Faculty of Medicine class of 2018. From 264 new students of class 2018, samples that met the research criteria were 97 responden

Table 1. Distribution of Respondents by Sex

Sex	N	%
Male	31	32
Female	66	68
Total	97	100

Based on **Table 1.** there are more respondents with female gender than men (Table 1). Where women numbered 66 respondents (68%) while men numbered 31 respondents (32%). This result is in line with the research conducted by Putra et al (2015) at Sam Ratulangi University in Manado regarding BSL of Faculty of Medicine students in 2015, there were 27 female respondents (52.9%) and 24 male respondents (47.1%).

Table 2. Distribution of Respondents by Age

Age	N	%
16	1	1
17	31	32
18	53	54,6
19	9	9,3
20	2	2,1
21	1	1
Total	97	100

Based on **Table 2.** the results showed that most respondents were at 18 years old amount 53 (54.6%) (Table 2). This result is in line with the research conducted by Putra *et al* (2015) at Sam Ratulangi University in Manado regarding BSL of Faculty Of Medicine students in class 2015 that the most respondents were at 18 years old amount 26 respondents (51.9%) out of 51 total respondents. This is in line with the theory which says that the average age of students in Indonesia are at 18-24 (Paramita, 2010)

Table 3. Distribution of Respondents Based on Random BSL During Before and After Lecture in Initial Semester

BSL	N	%
Before		
Low	35	36,1
Normal	62	63,9
High	-	-
After		
Low	28	28,9
Normal	68	70,1
High	1	1
Total	97	100

Based on **Table 3.** the results of BSL before initial semester lecture showed that 62 respondents (63.9%) had normal BSL and BSL after initial semester lecture showed that 68 respondents (70.1%) also had normal BSL (Table 3). This result is in line with the research conducted by Putra *et al* (2015) at Sam Ratulangi University in Manado regarding BSL of Faculty Of Medicine students in 2015 who got the results as many as 42 respondents (82.4%) had normal BSL. And in this research, BSL was obtained before the initial semester lecture was more on women than men as much as 38 (39.15%) had normal BSL and male as many as 24 people (24.77%) at BSL after initial semester lecture got 43 (44.30%) female and male respondents were 25 (25.81%).

In this research, the results are in line with the theory which says that at a young age carbohydrate metabolism and other organ functions are still good.

This normal BSL is a manifestation of the ability of insulin secretion by the pancreas and the ability of glucose cells by target cells (Rochmach, 2010).

Table 4. Distribution of Respondents Based on BMI Before and After Lectures in Initial Semester

Body Mass Index (BMI)	N	%
Before		
Underweight	9	9,3
Normoweight	40	41,2
Overweight	17	17,5
Obese	31	32,0
After		
Underweight	14	14,4
Normoweight	41	42,3
Overweight	14	14,4
Obese	28	28,9

Based on Table 4. the results of BMI before initial semester lectures were 40 respondents (41.2%) with normoweight (normal) and the BMI after initial semester lectures were 41 respondents (42.3%) with normoweight (normal). The results were in line with research conducted by Oktaviani et al (2012) regarding the relationship between dietary habits and activities with BMI student of SMA Negeri 9 in Semarang found that there were 37 respondents (46.26%) out of 80 respondents with normoweight (normal).

However, different results were obtained from the research conducted by Tandean *et al.* (2015) regarding BMI in the Senate members of the Faculty Of Medicine Manado student which obtained the most results with Obese (obesity) as many as 14 respondents (70%) out of a total of 20 respondents. This change in BMI is in line with the theory that physical activity and regular physical exercise can increase muscle mass and reduce body fat mass, while adequate physical activity can cause a reduction in muscle mass and an increase in adipocytes (Guyton *et al.*, 2014).

And in this study obtained BMI before initial semester lecture as many as 31 people (31.94%) women and 9 people (9.29%) men with normoweight (normal) and on BMI after initial semester lecture as many as 32 people (32.98%) women and 9 people (9.28%) in men with normoweight (normal).

This result is different from the research conducted by Tandean *et al* (2015) regarding BMI in Senate members of the Faculty Of Medicine Manado student which found that more men with normoweight (normal) were confident as many as 2 respondents (10%) out of 17 male respondents.

In this research, the results obtained were not in line with the research obtained from the theory which said that men should have more obesity BMI than women. Gender has an influence on one's body weight. In obesity, the amount of body fat is more than others. In young adults male body fat >25% and women >35% (Setiati *et al.*, 2015).

Table 5. Comparison of BSL and BMI before and after lectures in the initial semester.

	Before	After	p
BSL	83 (37-132)	87 (43-185)	0,028
BMI	22,9 (15,6-39,4)	22,6 (14,2 – 38,8)	0,038

From result data BSL before the lecture obtained median value was 83 mg/dL and after the lecture was obtained the median value of 87 mg/dL. For BMI before the lecture obtained median value was 22.9 kg/m² and BMI after the lecture with a median value of 22.6 kg/m². Next, the results data were analyzed using the normality test. In data normality test using Shapiro-Wilk obtained the results of BSL and BMI were not normally distributed (p<0.05). Then further analyzed by the Wilcoxon nonparametric test obtained significant results in BSL (p=0.028) and BMI (p=0.38).

4 CONCLUSIONS

Based on the research that has been done, it can be concluded that there are differences in initial BSL and BMI of the USU Faculty Of Medicine students in 2018 before and after the initial semester lecture.

5 SUGGESTION

Based on the results of the research, the authors suggest further research is needed by paying attention to the comparison of the CBC lecture patterns with non-CBCs as well as further research on the analysis of factors that influence changes in BSL and BMI in students.

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