

Student Name

Professor Name

Course

Date

Body Fat and Body Mass Index (BMI)

Health is an important pillar in building a strong society. The lifestyle of a person is determined by individual eating habits and engagement in physical activities. More often, individual health status is determined by one's lifestyle (Luu et al.). This study investigates the association between body fat (%) and the BMI of an individual. The result will help make healthy decisions and advise on good health.

Method

Data was collected from students using a structured questionnaire. The students were asked to provide their demographic information, percentage of body fat, and body mass index. A simple random sampling technique was used to collect the data, where each participant was given an equal opportunity for participating in the study. A sample size of 20 students was taken, with 45 % being male and 55% being female.

The correlation analysis was employed to investigate the association between body fat and student body mass index. For this method to be used, there must be two dependent variables and an independent variable (Gogtay 79). In this case, the dependent variable was the BMI of the student measured in kg/m^2 , while the independent variable is the body fat measured in percentage (%).

The study formulated and tested the following hypothesis on the association linking the body fat and student BMI.

H₀: No significant association linking body fat and BMI.

H₁: A significant association linking body fat and BMI.

Results

Correlation coefficient is computed as follows:

$$r = n$$

	BMI (Y)	%Body Fat (X)	XY	Y ²	X ²
	20.77	16.93	351.6361	431.3929	286.6249
	21.63	21.47	464.3961	467.8569	460.9609
	25.23	33.24	838.6452	636.5529	1104.898
	20.67	24.85	513.6495	427.2489	617.5225
	24.56	29.56	725.9936	603.1936	873.7936
	21.3	23.08	491.604	453.69	532.6864
	18.97	17.53	332.5441	359.8609	307.3009
	33.94	41.76	1417.334	1151.924	1743.898
	22.32	19.58	437.0256	498.1824	383.3764
	26.14	31.81	831.5134	683.2996	1011.876
	45.7	42.83	1957.331	2088.49	1834.409
	36.71	36.31	1332.94	1347.624	1318.416
	18.95	26.74	506.723	359.1025	715.0276
	27.99	32.01	895.9599	783.4401	1024.64

	23.92	29.3	700.856	572.1664	858.49
	36.71	36.31	1332.94	1347.624	1318.416
	22.24	25.4	564.896	494.6176	645.16
	18.3	16.48	301.584	334.89	271.5904
	22.46	23.04	517.4784	504.4516	530.8416
	22.46	15.39	345.6594	504.4516	236.8521
Sum	510.97	543.62	14860.71	14050.06	16076.78

The sample size, $n = 20$

Therefore, we employ the formulae as follows;

$$r = \frac{(20 \cdot 14860.71) - (510.97 \cdot 543.62)}{\sqrt{[(20 \cdot 16076.78) - (543.62)^2][20 \cdot 14050.06 - (510.97)^2]}}$$

$$\frac{(297214.2) - (277773.5114)}{\sqrt{26012.896 \cdot 19910.8591}}$$

$$= \frac{19440.6886}{\sqrt{517939107}} = \frac{19440.6886}{22758.276}$$

$$= 0.854$$

The correlation coefficient, $r = 0.854$

We obtain the following test statistic:

$$= \frac{r\sqrt{n-2}}{\sqrt{1-r^2}}$$

$$= \frac{0.854\sqrt{20-2}}{\sqrt{1-0.854^2}}$$

$$= 6.964$$

The t-distribution, the tabulated t-value with 18 degrees of freedom ($20 - 2$),
t-tabulated = 2.1014.

Since the computed value (6.964) is greater than the tabulated or critical value (2.1014), we will reject the null hypothesis. Hence, we deduce a significantly strong and positive association linking body fat with the BMI ($r = 0.854$, $t\text{-critical} = 2.1014$). It implies that people with a high percentage of fat accumulation in their body have a high body mass index.

In conclusion, the study assessed the association linking BMI and body fat percentage in students. It revealed there was a significant relationship between BMI and body fat percentage. Thus, students with high body fat are associated with a high BMI. Therefore, the students should reduce their body fat accumulation via regular exercises and adopt healthy eating habits to stay healthy.

Works Cited

Gogtay, N. J., and U. M. Thatte. "Principles of correlation analysis." *Journal of the Association of Physicians of India* 65.3 (2017): 78-81.

Luu, Hung N., et al. "High BMI in relation to low risk of lung cancer among never smokers." (2019): 631-631.