



Correlation between Body Mass Index and Myopia in Medical Student Universitas Sriwijaya Palembang Indonesia

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ABSTRACT

Myopia is a refractive disorder in which parallel rays that enter the eye fall in front of the retina in the resting eye (without accommodation). Nutritional factors are thought to have a role in the development of myopia where body mass index (BMI) is related to the length of the eyeball, the depth of the vitreous space, and the curvature of the cornea. This study aims to find out the correlation between body mass index and myopia in medical students at Sriwijaya University, Palembang. A case series study was undertaken from September to November 2107 at the Sriwijaya Eye Center Hospital Polyclinic, Palembang. There are 80 patients with myopia fulfilled the inclusion criteria. The correlation between body mass index and myopia was analyzed using Spearman's rho. Data analysis using SPSS version 18.0. From 80 respondents, 34 people (42,5%) men and 46 people (57,5%) female. Mean age of patients with myopia $24,348 \pm 4,424$ years old with age range 19-34 years and mean body mass index of respondents with myopia of $23,324 \pm 3,463$ kg/m² with range 17,63-32,81 kg m². In addition, there was no significant positive correlation between the body mass index and myopia ($r = 0.133$; $p = 0.238$; $n = 80$). There was a very weak, non-significant positive correlation between body mass index and myopia in medical students at Sriwijaya University, Palembang.

Keywords: Body Mass Index, Correlation, Medical Student, Myopia

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INTRODUCTION

Refractive disorder is a condition that requires special attention especially in school-aged children. If at this time refractive abnormalities are not corrected it can interfere with the teaching and learning process in children and furthermore can cause amblyopia. In the world refractive abnormalities is the third leading cause of blindness that is 0.14% after cataract (0.78%) and glaucoma (0.20%) [1].

Myopia is a refractive disorder in which parallel rays that enter the eye fall in front of the retina in the resting eye (without accommodation) where one can see the near object but the distance vision is poor. Genetic factors and environmental factors are risk factors that play an important role in the occurrence of myopia. Genetic factors include age, sex, family history and history of premature birth. Genetic factors can decrease the nature of refractive abnormalities to offspring either autosomal dominant or autosomal recessive [2-4].

Nutritional factors are thought to have a role to the development of myopia. IMT is associated with the length of the eyeball, the depth of the vitreous space, and the curvature of the cornea. In people with obese IMT tends to suffer

hyperopic because the eyeball is shorter with a shallower vitreous space and a more curved curvature of the cornea. In contrast, people with skinny IMT have longer eyeballs with deeper vitreous space and a thinner corneal curvature [5].

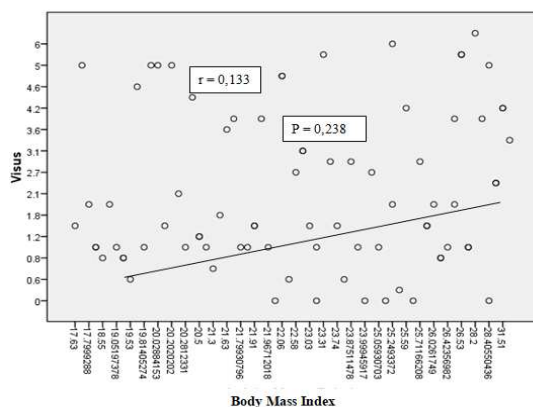
MATERIALS AND METHODS

A case series study was undertaken from September to November 2107 at the Sriwijaya Eye Center Hospital Polyclinic, Palembang.. There are 80 patients with myopia fulfilled the inclusion criteria.

Patients with postural abnormalities or those with impairment making it difficult to measure BMI is an inclusion criterion in this study. The correlation between body mass index and myopia was analyzed using *Spearman's rho*. Data analysis using SPSS version 18.0.

RESULTS

Characteristics of research subjects are shown in Table 1. From 80 respondents got 34 people (42,5%) men and 46 people (57,5%) female. Mean age of patients with myopia 24,348 ± 4,424 years old with age range 19-34 years. The average height of respondents is 163.16 ± 7.019 cm with the range 146 -178 cm while the average body weight is 62,425 ± 11,967 kg with range 40 - 90 kg. Mean body mass index of respondents with myopia is 23,324 ± 3,463 kg/m² with range 17,63 - 32,81 kg/m². Average visus of the right eye of the patient myopia 2,313 ± 1,941 while the left eye vision of the patient 2.147 ± 2.085.



Picture 1: Correlation Between Body Mass Index And Myopia

Table 2 shows correlation between body mass index and myopia. From the statistical analysis, there was a very weak positive correlation that was not significant between body mass index and myopia ($r = 0,133$; $p = 0,238$; $n = 80$).

Table 1: Characteristics Of Research Subjects

Characteristic	Total	Percentage (%)
Sex (n,%)		
• Male	34	42.5
• Female	46	57.5
Body Mass Index (n,%)		
• Underweight	4	5.0
• Normoweight	48	60.0
• Overweight	25	31.2
• Obesity	3	3.8
Age (years), Mean ± SD (Min-Max)	24.348 ± 4.424	(19-34)
Height (cm), Mean ± SD (Min-Max)	163.16 ± 7.019	(146-178)
Weight (kg), Mean ± SD (Min-Max)	62.425 ± 11.967	(40-90)
Body Mass Index (kg/m ²), Mean ± SD (Min-Max)	23.324 ± 3.463	(17.63 - 32.81)
Visus (Mean ± SD)		
• Ocular Dextra	2.313 ± 1.941	
• Ocular Sinistra	2.147 ± 2.085	

Table 2: Result Of Correlation Analysis Of Body Mass Index With Miopia

Correlation	N	Mean ± SD	r	P value
Body Mass Index	42	23.32 ± 3.463	0.133*	0.238*
Visus	42	2.324 ± 1.848		

Spearman's rho Test

DISCUSSION AND CONCLUSION

This study was undertaken in medical students from total second year students as much as 32.2% with the incidence rate after undergoing education. According to Woo et al (2004) in UNS that there are 89.9% of them experience myopia events in the second year. This is lower than the research by Mutiah et al in West Sumatra Padang with the number 60.2% while Sepnita et al in Riau in 2014 reported that 56.5% of students experience myopia [6-8].

One important factor in the development of myopia is the nutritional factors that play a role. A study reported that body mass index increased in patients with myopia. In obese people usually tend to hyperopic because of shorter eyeballs with vitreous space is more shallow and curvature of the more curved corneas [5]. In this study found that the correlation is very weak with the strength of the relationship $r =$

0.133 and p value = 0.238 ($p > 0.05$) means that the higher the BMI greater the myopia suffered but with a very weak and not significant. A study devoted to assessing the correlation between BMI with myopia and BMI is still small. Especially in Indonesia has never been studied.

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CONCLUSION

There was a very weak, non-significant positive correlation between body mass index and myopia in medical students at Sriwijaya University, Palembang.

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