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The Association of body mass index and blood glucose level with increasing of blood pressure among population in Magelang district, Central Java, Indonesia

Sani Rachman Soleman
Department of Public Health, Faculty of Medicine, Universitas Islam Indonesia, Indonesia

Objectives: Hypertension is the most prevalence in Indonesia based on basic health research (RISKESDAS) in 2018. In central java province, the prevalence of hypertension slightly increased around 38 % among population based on the survey, that pointed central java in number four provinces in Indonesia. Several risk factors have been identified such metabolic disorder including body mass index (BMI) and blood glucose level (BGL) alongside lifestyle and salt consumption. This study was very important to manage metabolic parameter as risk factor of hypertension among population in magelang district, central java in Indonesia.

Methods: A cross sectional study was design with consecutive sample method. According to sample calculation was obtained 202 respondents. There were independent variables such as BMI and BGL meanwhile dependent variables were systolic and diastolic blood pressure. BMI and BGL were measured directly by taking blood via vein puncture and analyzed in laboratory. In the other hand, blood pressure was measured by sphygmomanometer that divided into systolic blood pressure (SBP) and diastolic blood pressure (DBP). The data was analyzed by spearman correlation.

Results: According to descriptive analysis was found female respondents 81.2%, age < 45 years old 51.5%, low education 43.6%, unemployed 41.6%, normal BMI 43.1%, normal BGL 68.3% and normal blood pressure 66.8%. Kolmogorov smirnov was found p value 0.00, means that distribution data was not normal. Spearman correlation was obtained that BMI (p value 0.02, r 0.213 for SBP and p value 0.00, r 0.288 for DB), meanwhile BGL was found (p value 0.015, r 0.171 for SBP and p value 0.083, r 0.122).

Conclusions: According to the study claimed that BMI and BGL associated with increasing of blood pressure. The more increasing of BGL and BMI, the more improved of blood pressure among respondents.

Table of study

Table 1. Baseline characteristic among respondents in population

Variable	n(%)
Sex	
Male	38 (18.5)
Female	164 (81.2)
Age	
< 45	104 (51.5)
≥ 45	94 (46.5)
Education	
Low	88 (43.6)
High	71 (35.1)
No explanation	43 (21.3)
Occupation	
No occupation	84 (41.6)
Farmer	36 (17.8)
Others	43 (21.2)
No explanation	39 (19.4)
BMI	
Underweight	18 (8.9)
Normal	87 (43.1)
Overweight	53 (26.2)
Obese	12 (5.9)
Extreme obese	3 (1.5)
Not applicable	29 (14.4)
BGL	
Normal	138 (68.3)
High	64 (31.7)
Blood pressure	
Normal	135 (66.8)
Hypertension	67 (33.2)

Table 2. Correlation BMI and BGL with increasing blood pressure among respondents

Variable	SBP		DBP	
	p value	r	p value	r
BMI	0.02	0.213	0.00	0.288
BGL	0.015	0.171	0.083	0.122