

Nutritional Status, Blood Pressure Levels, and The Associated Risks for Hypertension in Islamic High School Teachers in Medan

Risti Rosmiati¹, Nila Reswari Haryana^{2*}, Hardi Firmansyah³, Rasita Purba⁴, Latifah Rahman Nurfazriah⁵, Muhammad Edwin Fransiari⁶

{ristirosmiati@unimed.ac.id¹, nilareswariharyana@unimed.ac.id², hardigizi@unimed.ac.id³, rasita.purba@yahoo.com⁴, latifahrn@unimed.ac.id⁵, edwinfransiari@unimed.ac.id⁶}

Study Program of Nutrition, Major of Family Welfare Education, Faculty of Engineering, Universitas Negeri Medan, North Sumatera, 20221, Indonesia

Abstract. Several studies on body size and hypertension have been conducted among various people and professions. Teachers serve as role models for their student's health and well-being, particularly regarding nutritional status and physical outlook. However, many teachers face health issues that they do not consider a threat to their career or personal life. The purpose of this research was to establish the relationship between nutritional status and the prevalence of hypertension among Islamic high school instructors in Medan. This cross-sectional research involved 74 teachers from three Islamic high schools in Medan between July-August 2022. Data collected using interviews, anthropometric and blood pressure measurements. The results showed that there were 40 teachers (54.1%) overweight based on BMI category, while there were 46 teachers (62.2%) had hypertension. A significant association between overweight nutritional status and the prevalence of hypertension was established using logistic regression analysis ($p = 0.001$, 95% CI: 2.145 - 19.719). Teachers with overweight are 6.5 times more likely to have hypertension than those with normal nutritional status, which was controlled by the confounding variable, employee status ($p = 0.016$; OR 14.3, 95% CI: 1,629 - 125,931). Therefore, the nutritional status of teachers in Islamic High School have to be concern to prevent hypertension, so they can have better performance in school and in a personal life.

Keywords: employee status, hypertension, overweight, risk factor, teachers

1 Introduction

Hypertension is a cardiovascular disorder that is often found in the community. Indonesia still have a quite high of hypertension prevalence, although not as high as in developed countries, which is around 10%. Complications of hypertension can affect the target organs of the heart, brain (cerebrovascular), eyes, and kidneys [1].

In Indonesia, based on interviews, the frequency of hypertension (being identified and taking hypertension medicine) increased 1.9% from 2007 to 2013, while based on the measurement results it was 25.8% [2]. A study conducted in China showed the prevalence of hypertension was 25.19% [3]. A survey conducted on adults aged 18-65 years in Vietnam found the prevalence in men was 14.4% and 11.7% in women [4]. Research conducted on subjects older than 15 years in Malaysia showed the prevalence of hypertension was 27.8% where the prevalence of men (29.6%) suffering from hypertension was greater than women (26%)[5].

Hypertension occurs because of the risk factors that influence it. Several risk factors that influence hypertension include age, gender, genetics, nutritional status, food intake and lifestyle. Lifestyle factors that can influence the incidence of hypertension include stress, smoking habits, and physical activity [3], [5]. Good nutritional status is related to the balance of energy intake and physical activity. The result of that, will increase work productivity, worker attendance, and avoid chronic diseases [6].

Nutritional status also associated with hypertension. Nutritional status in obesity category will be at risk of having high blood pressure. The outcomes additionally indicated a correlation between nutritional status and hypertension (OR=5.11). [7]. Obesity can cause hypertension by increasing the cardiac output. The higher the body mass index (BMI), the more blood enters the circulation, so that the cardiac output increases [8].

Teacher is a profession that teaches students to establish the future. Several studies have found a correlation between teaching job and long-term health issues such as cardiovascular disease, obesity, high blood pressure, hyperlipidemia, and insulin resistance, which can cause distress and malfunction in many organs. The results of other study also showed that the risk of heart disease was found in male and female teachers who had systolic blood pressure (> 159 mmHg) [9]. Teacher health is influenced by various risk factors including an unbalanced diet [6]. Teachers as educators are important to maintain health and become role models for their students. Therefore, the objective of this research was to identify nutritional status, levels of blood pressure, and other variables that affect the prevalence of hypertension among Islamic high school teachers in Medan..

2 Research Method

Between July and August 2022, 74 Islamic school teachers in Medan participated in this cross-sectional study. The teachers were from Al Amjad, Al Washliyah and Al Ulum Terpadu Islamic High School and ranged in age from 19 to 64. They were recruited using purposive sampling.

The dependent variable was hypertension, which was measured using blood pressure assessments. Furthermore, socioeconomic characteristics and nutritional status were independent predictors. Sex, age ranges (44, 45 - 54, or 55 years), level of education (senior high school or tertiary), ethnic background from Sumatera (Batak, Nias, Mandailing, Karo, Minang, or Aceh) as well as others (Java, Sunda, Bugis), marriage status (unmarried or married), the number of family members (4 people, 5-6 people, 7 people), status as an employee, and salary (below or above regional minimum wage for Medan City) were the sociodemographic variables used to control potential confounders. All information was gathered using a survey hosted on Kobo toolbox.

Nutritional status was evaluated using anthropometric measurement. At recruitment, height and weight were assessed using standard methods by trained enumerator. A microtoise (model GEA SH-2A) was used to measure standing height to the closest 0.1 cm, and Body weight was measured to the closest 0.1 kg using a weight scale (model Karada Scan OMRON HBF-375). The body mass index (BMI) was generated using formula, the weight (kg) divided square of height (m) and individuals were classified as normal (BMI 18.5 to <25.0) and overweight (BMI 27) [10].

Two blood pressure results were taken at 5 minute intervals in supine position using an automated blood pressure monitor (model OMRON HEM-8712), and the average was used to categorize the subjects into various stages of hypertension. Normal blood pressure is described as 120 mmHg systolic and 80 mmHg diastolic; pre-hypertension as 120-139 mmHg systolic

and/or 80-89 mmHg diastolic; and hypertension as 140 mmHg systolic and/or 90 mmHg diastolic.

The Universitas Sari Mutiara Indonesia Health Research Ethics Committee authorized the ethics of this research (Reference number: 1370/F/KEP/USM/VII/2022) as being in line with the Helsinki Declaration. Prior to their involvement, all participants signed informed consent papers.

Data from Kobo toolbox research forms were transferred to Microsoft Excel office 2019. They were descriptively examined using frequency and percentage. The logistic regression method was used to investigate the relationship between nutrition status and hypertension. This model was considered the most appropriate model to calculate odd ratio (OR). All sociodemographic data were included in the analysis.

3 Results and Discussion

In total, 74 subjects were included in the final category, with 42 males (57%) and 32 women (43%). Table 1 summarizes the respondents' demographic information. The majority of subjects (86.5%) were 44 years old, married (59.5%), and of Sumatera origin (60.8%). Almost all (94.6%) had a tertiary education and came from a small household (70.3%). Approximately half of the respondents earned less than the Medan City regional minimum salary (56.8%) as a permanent worker (79.7%).

Table 1. The Sociodemographic Characteristic, Nutritional Status and Blood Pressure Level

	Men (57%) n (%)	Women (43%) n (%)	Total n (%)
Age (years)			
≤ 44	38 (90.5)	26 (81.3)	64 (86.5)
45 – 54	2 (4.8)	5 (15.6)	7 (9.5)
≥ 55	2 (4.8)	1 (3.1)	3 (4.1)
Level of Education			
Senior High School	3 (7.1)	1 (3.1)	4 (5.4)
Tertiary	39 (92.9)	31 (96.9)	70 (94.6)
Ethnic Background			
Sumatera (Batak, Nias etc)	25 (59.5)	20 (62.5)	45 (60.8)
Others (Java, Sunda etc)	17 (40.5)	12 (37.5)	29 (39.2)
Marital status			
Not married	16 (38.1)	14 (43.8)	30 (40.5)
Married	26 (61.9)	18 (56.3)	44 (59.5)
Family Size			
≤ 4 people (small)	32 (76.2)	20 (62.5)	52 (70.3)
5-6 people (middle)	5 (11.9)	9 (28.1)	14 (18.9)
≥ 7 people (big)	5 (11.9)	3 (9.4)	8 (10.8)
Employment Status			
Contract worker	9 (21.4)	6 (18.8)	15 (20.3)
Permanent worker	33 (78.6)	26 (81.3)	59 (79.7)
Salary			
≥ Regional Minimum Wage	18 (42.9)	14 (43.8)	32 (43.2)
< Regional Minimum Wage	24 (57.1)	18 (56.3)	42 (56.8)
Nutritional Status			
Normal	16 (38.1)	18 (56.3)	34 (45.9)
Overweight	26 (61.9)	14 (43.8)	40 (54.1)

	Men (57%) n (%)	Women (43%) n (%)	Total n (%)
Blood Pressure Level			
Normal	14 (33.3)	14 (43.8)	28 (37.8)
Hypertension	28 (66.7)	18 (56.3)	46 (62.2)

The prevalence of overweight as per Indonesian Ministry of Health criteria was 54.1%. It was higher than normal in both men and women. The same results on blood pressure level prevalence, teacher with hypertension was higher than normal in both men and women.

Table 2. Associated Risk of Hypertension

	p-value	OR (95% CI)	Nagelkerke R Square
Nutritional Status	0.001	6.503 (2.145 – 19.719)	0.346
Employment Status	0.016	14.3 (1.629 – 125.931)	

OR (Odd Ratio); CI (Confidence Interval)

The prevalence of hypertension and overweight nutritional condition were found to be significantly correlated in this research ($p < 0.05$). Table 2. showed the OR value of 6.503 ($p = 0.001$, 95% CI: 2.145 - 19.719), mean that teachers who have overweight were more risk for hypertension 6.5 times compared to normal body mass index (BMI) which was controlled by the confounding variable, the status of employees ($p = 0.016$; OR 14.3, 95% CI: 1,629 – 125,931). These variables were found to affect 34.6% of the incidence of hypertension among Islamic high school teachers in Medan.

Kurnianto et al. discovered that nutritional status impacts hypertension by 0.787 times in Indonesian adolescents in Palembang, South Sumatera [11]. Other studies have found that obese/overweight adolescents are more likely than normal-weight adolescents to develop hypertension [12]. According to Widyatmoko's findings, there is a significant correlation between score of BMI and systolic-diastolic blood pressure in high school teachers. Widyatmoko's research showed that there is a significant relationship between BMI and systolic-diastolic blood pressure in high school teachers [13].

Employee status as permanent teachers provides a sense of security that affects their blood pressure levels. Job stability is one of the factors that affects an employee's work happiness; if career stability requirements are not fulfilled, instability at work could occur. One factor leading to work uncertainty is employment status, as future job security is unclear [14]. This is one of the causes of stress in teachers that triggers the increasing of blood pressure.

4. Conclusions

More than half of teachers who involved in this study had hypertension and overweight based on BMI category. The risk factors which influenced it is nutritional status and employment status. As a result of the study, it was determined that the prevalence of hypertension was significantly correlated with overweight nutritional state and employment status. Teachers with overweight are 6.5 times more likely to have hypertension than those with normal nutritional status, which was controlled by the confounding variable, employee status. Therefore, the nutritional status of teachers in Islamic High School have to be concern to prevent hypertension, so they can have better performance in school and in personal life.

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