Modifiable risk factors of hypertension and socio-demographic profile in Medan City

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Abstract— **Hypertension is a major public health problem and important area of research due to its high prevalence and its risk factors. Factors related to hypertension are categorized into modifiable and non-modifiable risk factors. The modifiable risk factors include obesity, physical in activity, high salt diet, smoking, alcohol consumption and others. This study was aimed to determine the prevalence, modifiable risk factors, and socio-demographic profile related to hypertension in Medan City. Cross sectional study design was used in this study. Purposive sampling was used to select a total of 440 respondents for this study. An interviewer administered questionaires was used to collect data and data analysis was performed by statistical software. The prevalence of hypertension in Medan City is 18.2%, while the prevalence of modifiable risk factors of hypertension such as smoking, alcohol consumption, obesity, no physical activity and always consume MSG are 32.5%, 17.5%, 17.9%, 91.6% and 47.3% respectively. There is a statistical significant relationship between physical activity with hypertension. The study showed high prevalence of modifiable risk factors of hypertension. It is needed to make preventive efforts to strengthen modification in life style model in an attempt to face the future epidemic of hypertension.**

Keywords: hypertension, prevalence, modifiable risk fators

I. INTRODUCTION

Until now, hypertension is still a big challenge in Indonesia. Hypertension is a condition that is often found in health services primary health. That is a health problem with a high prevalence, which is 34.1%, according to the 2018 Basic Health Research (Riskesdas) data [1]. In addition, hypertension control is not adequate despite many effective drugs are available.

Definition of hypertension or high blood pressure is an increase in systolic blood pressure more than 140 mmHg and diastolic blood pressure more than 90 mmHg at two times measurement with an interval of five minutes in a state of sufficient rest/calm. Increased blood pressure that lasts for a long time (persistent) can cause damage to the kidneys (kidney failure), heart (coronary heart disease) and brain (causing stroke) if it is not detected early and acquired adequate treatment [2]. Many hypertensive patients with no blood pressure controlled and the number continues to increase. Therefore, the participation of all parties, both doctors from various fields of specialization in hypertension, government, private and society is needed so that hypertension can be controlled.

At least 45% of deaths due to heart disease and 51% of deaths due to stroke are caused by hypertension. Approximately 40% of adults aged 25 and over were diagnosed with hypertension in 2018 worldwide; the number of people with hypertension increased from 600 million in 1980 to 1 billion in 2008. At 46% of adults aged 25 and above, the prevalence of hypertension is highest in the African world, while the lowest prevalence is seen in the Americas at 35%. Overall, high income countries have a lower hypertension prevalence -35%- than other groups at 40% [3].

There are a variety of risk factors that have been associated with the hypertension. Such factors can be categorized into modifiable and non-modifiable risk factors [4]. The non-modifiable risk factors are human traits or characteristics that cannot be modified or altered, so they are beyond our control and little or nothing can be done to control them; these factors include age, sex, race, family history, genetic composition, etc. Any other way modifiable hypertension risk factors are traits, characteristics, conditions or habit of life style patterns that can be modified or changed to prevent the disease from developing. Such modifiable risk factors include; obesity, excessive salt intake, inactivity or lack of exercise, high fat diet, tobacco use, alcohol consumption, etc.

In persepective of the elevated level of complications related to hypertension, early screening and prevention have extraordinary significance in accomplishing the objective of decreasing in the frequency of the disease. One way to deal with such anticipation is through the battle against the risk factors development. Therefore, a study was conducted to determine the prevalence of modifiable risk factors of hypertension in Medan City and to assess whether there is any relationship between these risk factors and socio-demographic variables. Data resulted from this study will play a role as a resource to promote awareness and empower community members to change their life style.

II. METHODS

The study was carried out in Medan City, in North Sumatera Province. It occupies an area of 265.10 km². Medan City lies between 3º.27' - 3º.47' of North Latitude 98º.35' - 98º.44' of East Langitude. In 2018, the population of Medan City reached 2,264,145 lifes [5]. It is made up of 21 subdistricts and 151 villages. Medan City is the capital city of the province of North Sumatera. It is the largest in Sumatera and the fifth-most populous city in Indonesia. Medan is multicultural metropolis and a busy trading city bordered by the Strait of Malacca. Majority of the main employment status are employees; others are own account workers, and unpaid workers. An analytic cross-sectional study was applied and it was conducted over a period of 6 months from April - October 2018. All persons aged 15 years and above in Medan City and who are voluntary to take a part in the study were included. Sample size was calculated using C Survey software for hypothesis testing and a sample size of 440 was derived from 11 subdistricts which have an active Integrated Development Post (POSBINDU). For each subdistrict, random sampling technique was used to select the first house hold, and the next household was chosen with the approach of nearest household and all the respondents that met the criteria required for the study in these selected communities were included and surveyed until the required number of respondents was complete. Ethical clearance was obtained from the ethical committee of the Faculty of Nursing University os Sumatera Utara before starting of the study. Permission to conduct the study was obtained from the Medan City Research and Development Institute, whereas individual informed consent was obtained from the respondents and the study included only those respondents who gave their consent. Data was collected using a pre-tested questionnaire administered by the enumerator. The questionnaire consisted of data on socio-demographic variables of the respondents was collected, as well as on their behavioral life styles, which included smoking habit, alcohol consumption, physical activity and dietary pattern. Enumerators had a common training program with standardization of the method of questionnaire administration, measurements of blood pressure and anthropometric indices. The questionnaire was sorted out, coded and the data were entered into the statistical software. Frequency tables and contingency tables were created and where appropriate test have been checked for significance at 0.05 (5%) using chi-square test.

III. RESULTS

Cluster sampling technique was used to select 440 respondents who participated in the study. About half, 71.4% of respondents were females. The mean age was 44.2 (17.2) years, with a majority 19.1% of the respondents being within the 35-44 years age. Most 46.8% of the respondents had graduated from senior high school.

TABLE I
SOCIODEMOGRAPHIC CHARACTERISTICS

Characteristic	Frequency	Percentage
Sex		
Male	126	28.6
Female	314	71.4
Age (years)		
15 – 24	76	17.3
25 – 34	65	14.8
35 – 44	84	19.1
45 – 54	83	18.9
55 – 64	65	14.8
65 – 74	52	11.8
75+	15	3.4
Last Education		
No school	9	2.0
Not completed in Elementary School	33	7.5
Graduated from Elementary School	63	14.3
Graduated from Junior High School	93	21.1
Graduated from Senior High School	206	46.8
Graduated from Higher Education	36	8.2
Occupation		
Driver	10	2.3
Domestic workers	114	25.9
Student	21	4.8
Army/Police	1	0.2
Civil Servant	7	1.6
Enterpreneurs	80	18.2
Private Employees	19	4.3
Farmer	1	0.2
Factory Workers	6	1.4
ConstructerWorkers	7	1.6
Retired	14	3.2
Others	160	36.3

Result of this study has shown that the prevalence of hypertension is 18.2%, also about 32.5% of the study respondents are smokers, while 17.5% of the respondents consume alcohol. About 5.2% of the study respondents are obese, of which the majority 16.3% are females.

Table 2, showed the relationship between some modifiable risk factors and hypertension. There is no relationship between smoking, alcohol consumption, obesity, flavoring MSG and oil for cooking with hypertension ($P > 0.05$). Only physical activity variable related to hypertension. Respondents with no physical activity and hypertensive are 19.4%, compared to 5.4% respondents with physical activity and hypertensive. This difference is statistically significant ($P = 0.035$).

TABLE II
MODIFIABLE RISK FACTORS AND HYPERTENSION

| Variables | Hypertension | | | | Total | | P |
| | Yes | | No | | | | |
	n	%	n	%	n	%	
Smoking							
Yes	22	15.4	121	84.6	143	100.0	0.291
No	58	19.5	239	80.5	297	100.0	
Alcohol consumption							
Yes	12	15.6	65	84.4	77	100.0	0.515
No	68	18.7	295	81.3	363	100.0	
Obesity							
Yes	9	30.0	21	70.0	30	100.0	0.485
No	33	23.9	105	76.1	138	100.0	
Physical Activity							
No	78	19.4	325	80.6	403	100.0	0.035
Yes	2	5.4	35	94.6	37	100.0	
Flavoring MSG							
Yes	62	18.3	276	81.7	338	100.0	0.873
No	18	17.6	84	82.4	102	100.0	
Oil for cooking							
Bulking	38	18.3	170	81.7	208	100.0	0.964
Packing	42	18.1	190	81.9	232	100.0	

IV. DISCUSSION

Four hundred and forty respondents participated in the study and the mean age was 44.2 ± 17.2 years. Majority of the respondents 46.8% of the respondents had graduated from senior high school. It was not surprising that most of the inhabitants in Medan City had senior high school level of education as their highest educational attainment. This is probably because Medan City is an urban community.

The prevalence of hypertension in the study is 18.2%; this is lower than that seen in national prevalence (34.1%) and North Sumatera prevalence (29.2%) [1] The hypertension morbidity and mortality alone have such a major impact on the economy and health care system of the country. It has become absolutely necessary to decrease and this can be done if diagnosis is made early and promptly controlled.

The prevalence of cigarette smoking in the study was 32.5%. This is higher than that of in a rural community in Edo State, where the prevalence was 16.8%,[6] as well as that found among U.S adult citizens in 2011, where the prevalence was recorded as 19.0%[7]. Using tobacco can cause blood pressure to temporarily increase and can contribute to damaged arteries.

Several studies have recognized smoking as one of the major causes of non-communicable and chronic disease [8]. WHO reports that an estimated 5.4 million people die each year because of cigarette smoking. Smoking is the world's sixth leading cause of death, and if the patterns stay unchanged until 2030, the number of deaths caused by smoking will increase to eight to ten million. The prevalence of cigarette smoking increased with increasing age in the study and this was also reported elsewere in other studies [9]. This is presumably because with increase in educational achievement, there is an increase in knowledge and individual awareness.

The prevalence of alcohol consumption in the study was 17.5%. Drinking alcohol frequently significantly increases the likelihood of hypertension. It freatly increases the likelihood of stroke, heart disease, vascular dementia and chronic kidney disease, and drinking alcohol regularly may present significant health risks. In Xuzhou City, China a total of 4999 participants have beed identified as drinking alcohol. The alcohol consumption prevalence was 13.8% [10].

The prevalence of obesity in the study was 17.9%. This is lower than the prevalence in a nationwide survey in the Indonesia in 2018, where the prevalence of obesity among adults aged 18 years and above was 21.8% [1]. Overweight and obesity are characterized by a higher body mass index (BMI), as well as the risk for coronary heart diseases, angina heart failure, hypertension, stroke, osteoarthritis, type II diabetes, cancers, to mention but a few. Therefore policies are required to promote regular physical activity and healthy dietary choices while making them available, affordable and accessible to all. The findings of the study showed high levels of modifiable hypertension risk factors. Those rate are as high as those seen in developed countries, so the risk of hypertension is likely to increase in near future. Therefore to avoid this inevitable epidemic of hypertension in our population, changes in behavioral and lifestyle need to be promoted.

For primary prevention and treatment of hypertension, exercise is a key component in lifestyle therapy. A number of studies consistently show beneficial effect of exercise on hypertension with decreases in systolic and diastolic blood pressure with reductions of as much as 5-7 mmHg in those with hypertension [11-13].

V. CONCLUSION

The prevalence of modifiable risk factors of hypertension in Medan City is comparable to the values seen in developed countries. It therefore means that if nothing is done to reverse this ugly trend and style of living; hypertension and other NCDs will soon become an epidemic in the country coupled with epidemics of communicable diseases still plaguing us.

VI. ACKNOWLEDGMENT

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