

Prevalence, awareness, treatment and control of hypertension and its risk factors

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INTRODUCTION

- Hypertension is an important risk factor for cardiovascular disease.
- Hypertension is the third killer and according to the WHO, accounts for 1 in 8 deaths worldwide.
- It increases the risk of stroke, myocardial infarction, congestive heart failure, sudden cardiac death, peripheral vascular disease, and renal insufficiency.^[1]

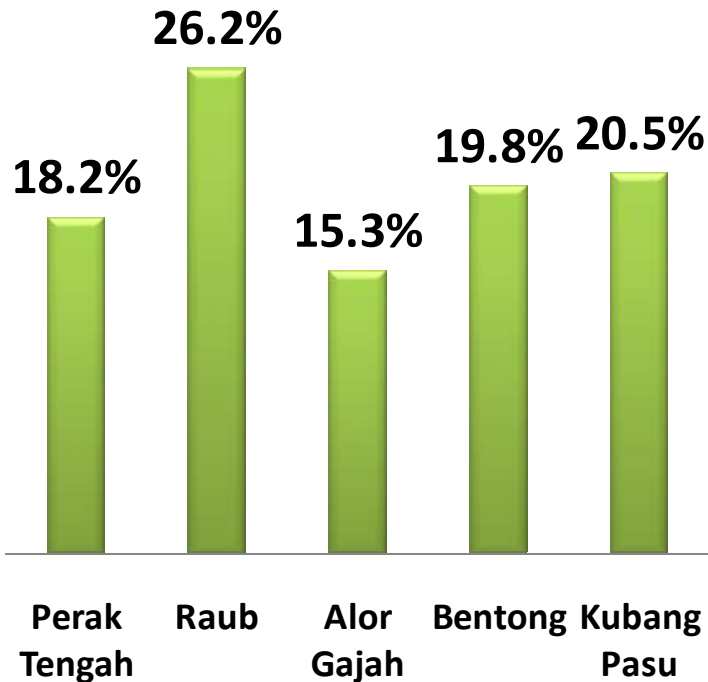
OBJECTIVES

- To determine the prevalence of hypertension by age, sex & race.
- To describe the risk factors of hypertension (age, sex, race, BMI, physical activity, smoking, family history)
- To correlate the risk factors of HPT to the prevalence of hypertension.

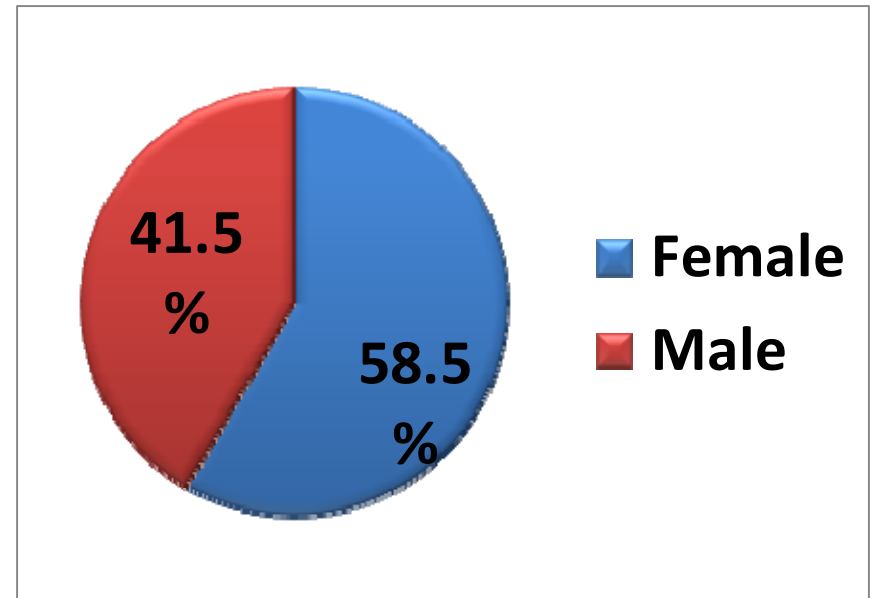
STUDY METHOD

- **Study Design:** Cross sectional study
- **Study Period:** 10th - 25th June 2007 (2 weeks)
- **Study Area:** Five districts including Kubang Pasu, Perak Tengah, Alor Gajah, Raub and Bentong.
- **Study Population:** Applying 'complete case method' in our survey, we exclude respondents who are less than 15 years old and also missing data regarding variables used. Thus the population came up to a total of 1871 respondents. (n=1871)
- **Sampling Method:** 3 stage cluster sampling
- Operationalizing the survey
- Information collected using an interviewer administered questionnaire.

Distribution of Respondents



Distribution of respondent according to gender



n = 1871 for all above

The graph shows the distribution of respondents according to the 5 different stations and gender. Graph on the left tell that Raub contribute the largest of respondent which are 26.2% and the rest contribute almost 20%. Female respondents make 58.5% from 1871 respondents for all 5 stations while the rest are male respondents.

Distribution of respondent according to race and age

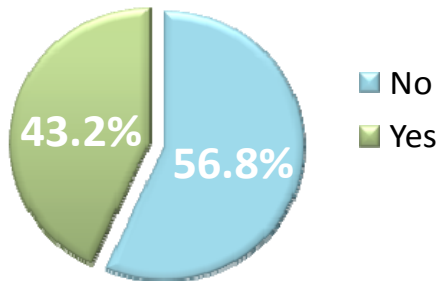
Race	Percent
Malay	83.4%
Other Bumiputeras	6.7%
Chinese	5%
Indians	3.6%
Others	1.3%

Age	Percent
< 15	15.2%
15 - 29.9	25.2%
30 - 44.9	25.2%
45 - 59.9	25.2%
≥ 60	25.2%

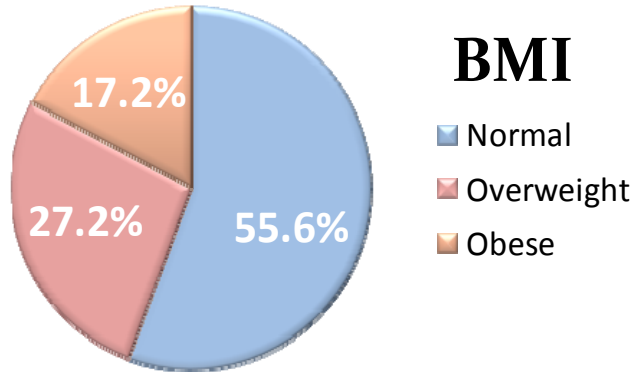
n = 1871

The vast majority of the respondents were Malay, making up 83.4%. Second was other Bumiputeras with 6.7% followed by Chinese, 5% and Indians 3.6%. Most of our respondent are in the 15 – 29.9 year old age group and the ≥ 60 year old age group, making 25.2% each.

Family history of hypertension

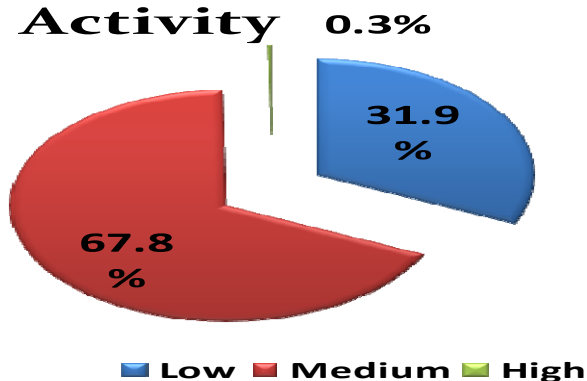


All the 3 pie charts shows about family history of hypertension, Body Mass Index and physical activity for all of respondents. Almost 60% of the respondents had no family history of hypertension. The obese were also substantial, with 17.2% while the overweight made up 27.2%.



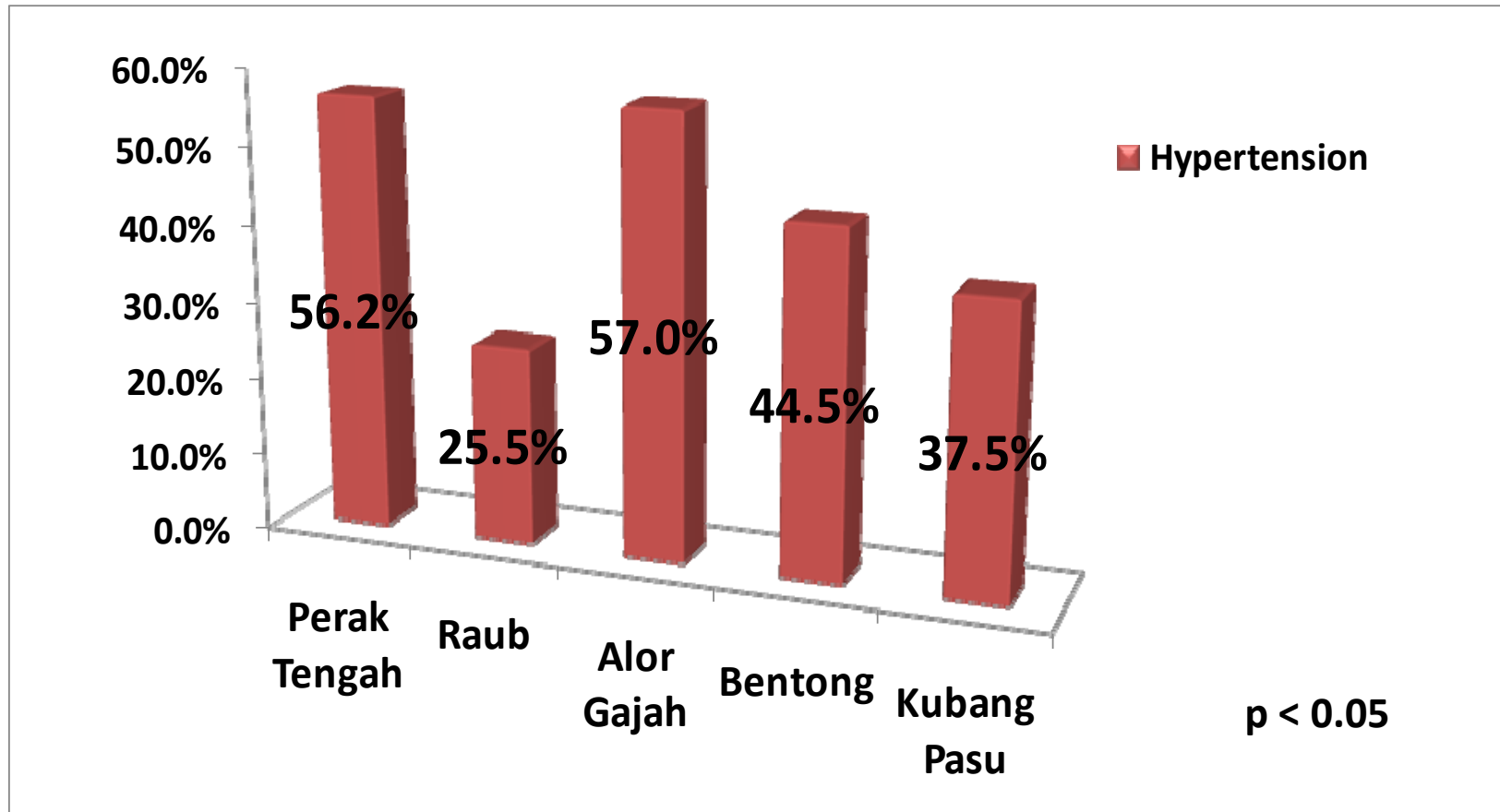
Most of the respondents also exercised moderately, making up more than 2/3s of the respondents, while 31.9% only did light physical activity. Only 0.3% did vigorous physical activities.

Physical Activity



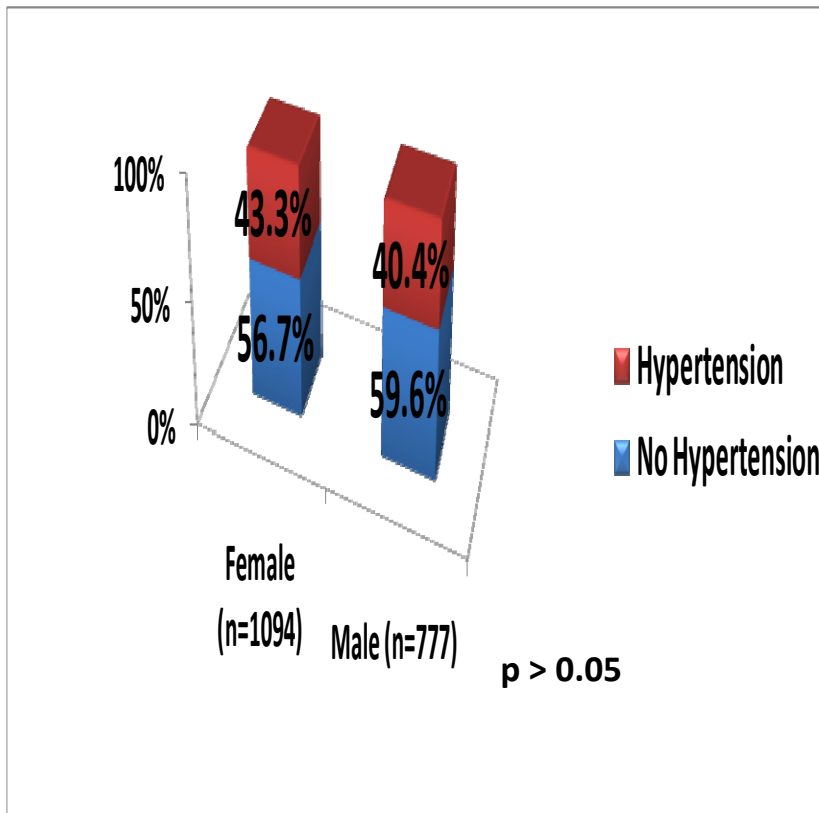
n= 1871 for all above

Prevalence of hypertension in districts



The bar chart above shows the prevalence of hypertension in 5 different districts. It tells that the hypertensive respondents were not uniformly distributed among all districts. Raub has the lowest prevalence of hypertensive, while Alor Gajah had the highest number with 57% while Perak Tengah was second with 56.2%.

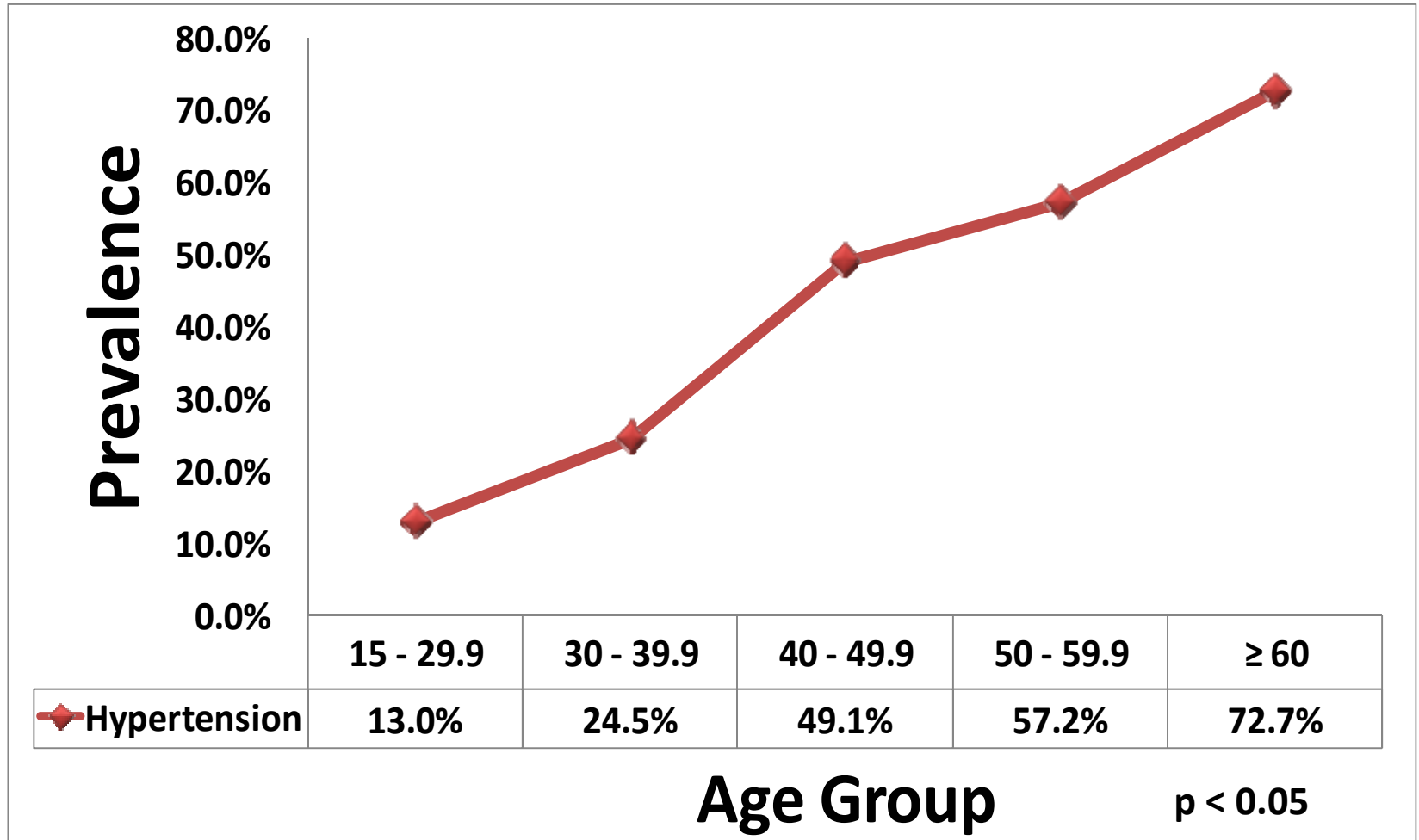
Association of gender with hypertension



The stacked bar chart shows the association of gender with hypertension. From the chart, 43.3% females have hypertension as compared to 40.4% of the males. However the *p* value and 95% CI both show it to be statically insignificant. However once the confounding variables were adjusted via the aforementioned logistic regression method, it showed that being male had in fact a 34% higher chance to develop hypertension.

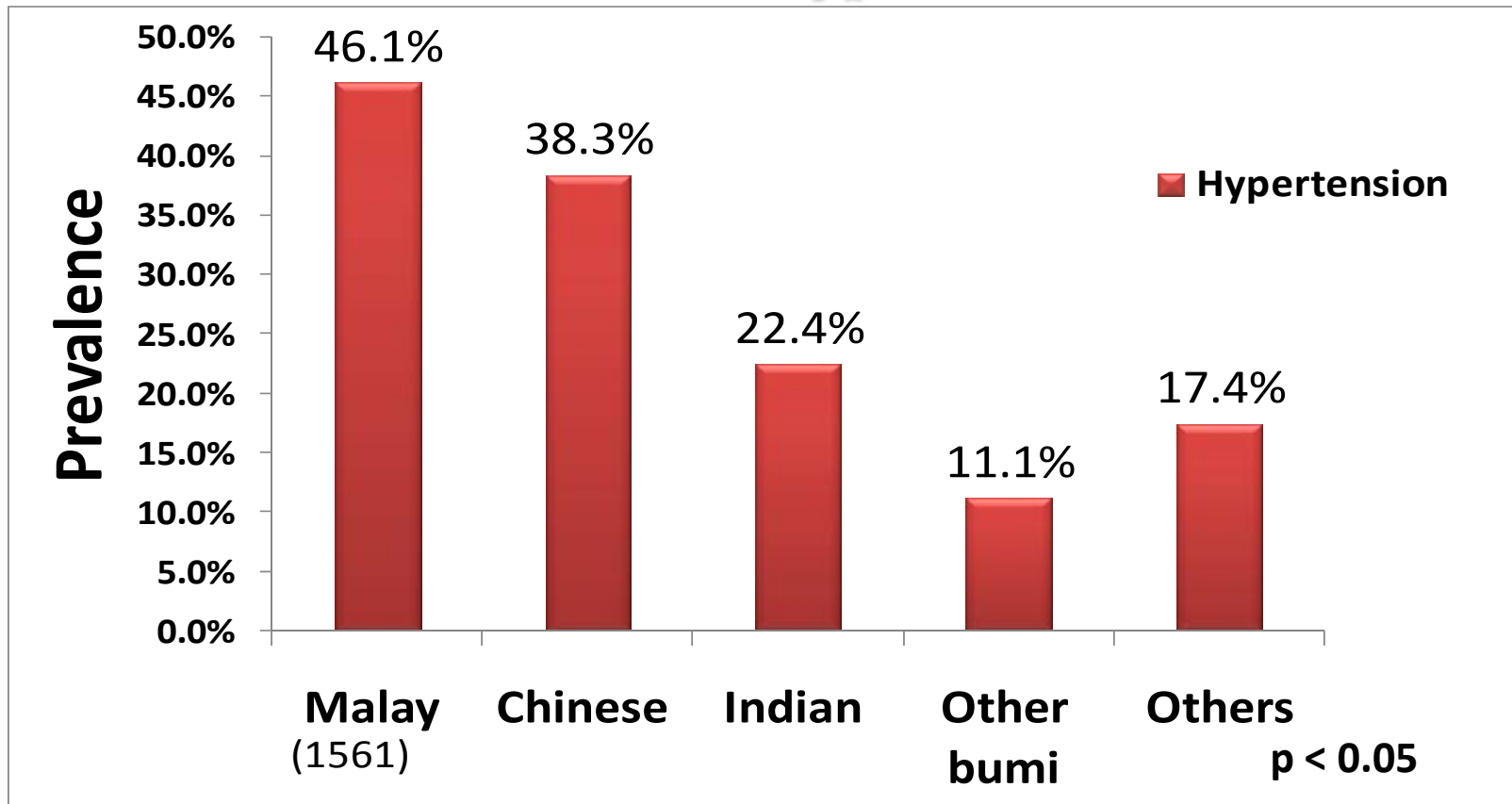
Sex	Crude Odds Ratio (95%CI)	p value	Adjusted Odds Ratio (95%CI)	p value

Association of age with hypertension



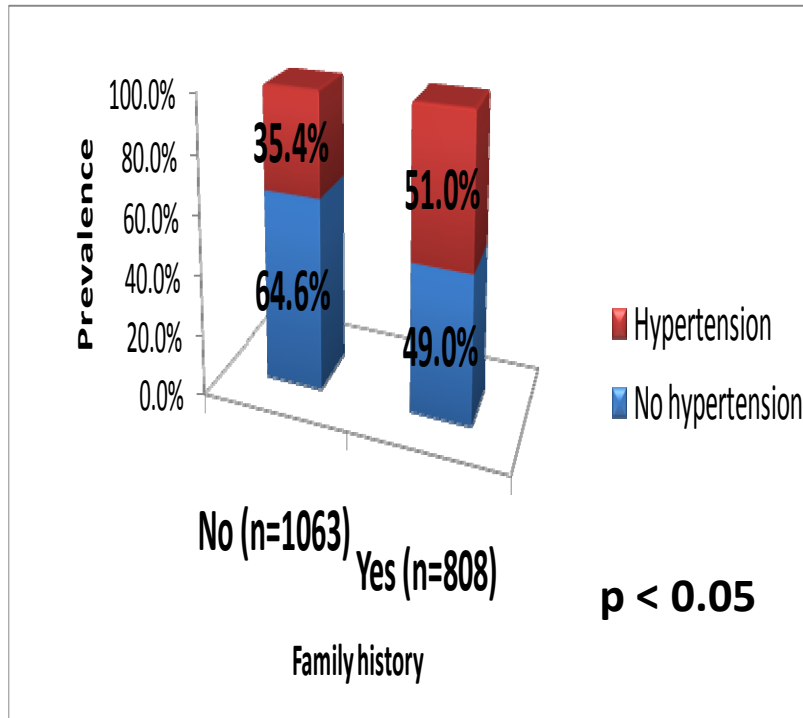
The graph line shows the association between age and hypertension. It can be clearly seen that as one ages, the hypertension becomes more common. In the age group of 15 – 29.9, 12.95% had hypertension, but in the ≥ 60 age group, hypertensive respondents made up almost $\frac{3}{4}$ of the respondents.

Association of race with hypertension



The bar chart shows the association of race with hypertension. It shows that many Malay have hypertension. In contrast, the other Bumiputeras have the lowest prevalence of hypertension, with just 11.1%. The p value is less than 0.05, making the differences significant. However when use the adjusted odds ratio, we find that the only differences between the prevalence of hypertension among Malays and Indians and the Malays and other Bumiputeras are actually of statistical significance.

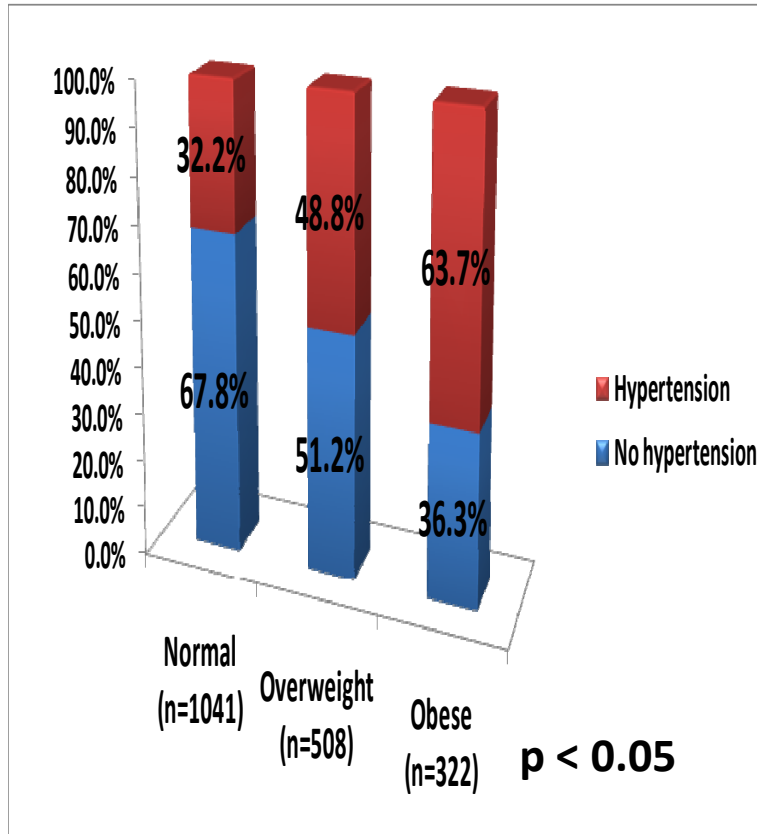
Association of family history with current hypertension



From the bar chart, the group with positive family history has a higher percentage of people with hypertension. This is statistically significant as the p value is smaller than 0.0001 both before and after adjusted. It shows that having a family history of hypertension makes one approximately twice as likely to develop hypertension compared to one who does not have any family history of hypertension.

Family History Of HPT	Crude Odds Ratio (95%CI)	p value	Adjusted Odds Ratio (95%CI)	p value

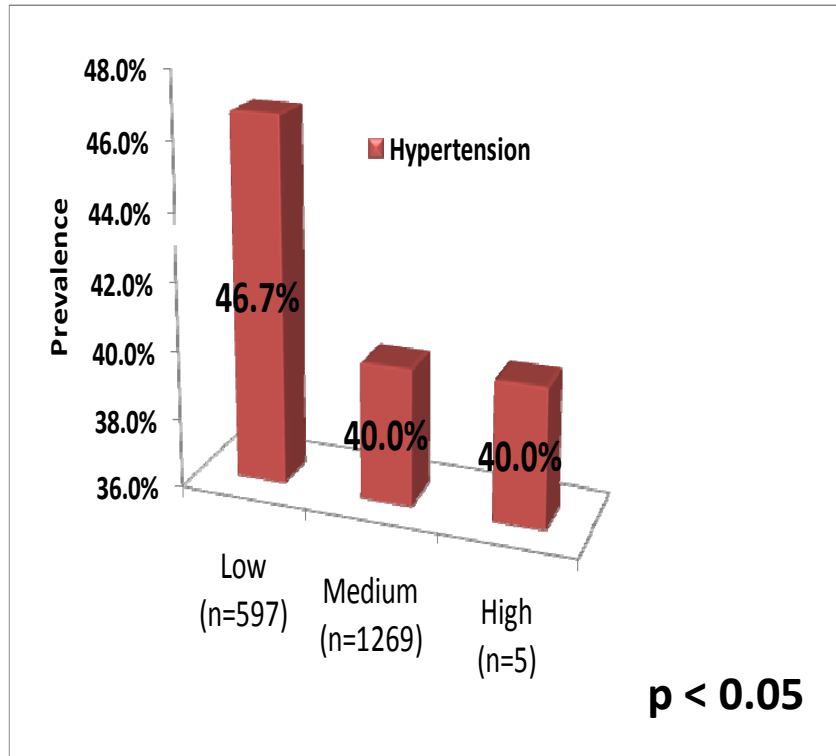
Association of BMI with hypertension



In this graph, there is a relationship between BMI and hypertension. As one moves up the BMI scale, one becomes more and more likely to develop hypertension. In the normal weight range, non hypertensive made up approximately 2/3s. On the other hands, in the obese weight group this is turned onto its head and hypertensive now make up almost 2/3s. From the crude odds ratio, being overweight makes one 2 times as likely to develop hypertension. Obese takes the odds up to 3.69.

Nutritional status	Crude Odds Ratio (95%CI)	p value	Adjusted Odds Ratio (95%CI)	p value

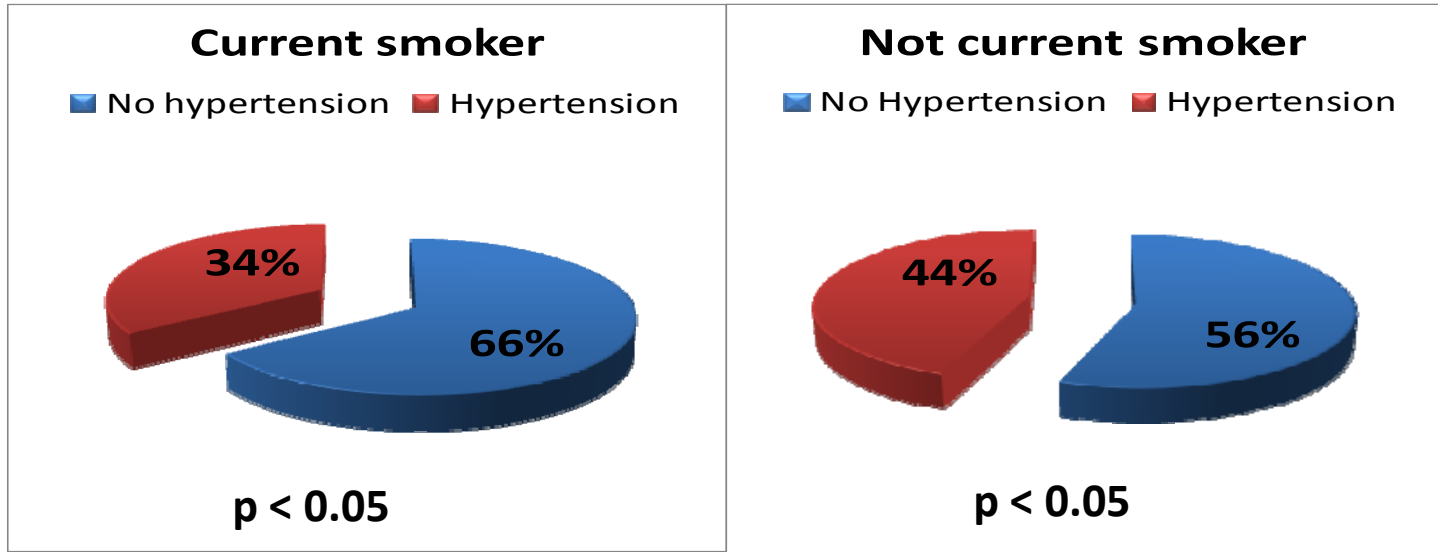
Association of physical activity with hypertension



The bar chart shows the association between physical activity and hypertension. The more physically active one is, the less likely one is to develop hypertension. However, vigorous exercise does not appear to be a protective factor against hypertension. However this difference is not of significance, as evidenced by both the 95% CI and the p value. This is due to extremely small sample size of

Physical activity	Crude Odds Ratio (95%CI) just 5 people.	p value

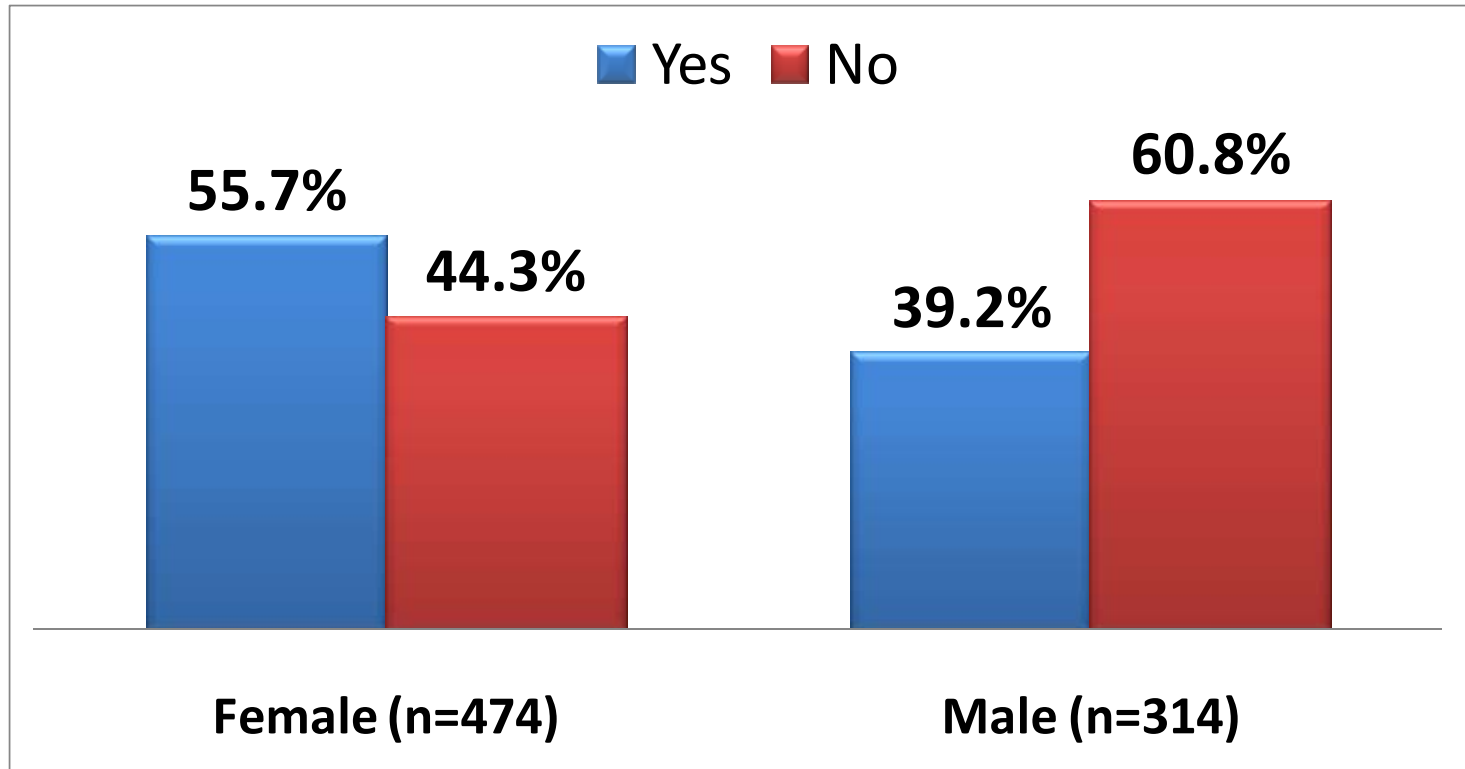
Association of smoking to hypertension



Current smoker	Crude Odds Ratio (95%CI)	p value	Adjusted Odds Ratio (95%CI)	p value

The pie chart shows the association of smoking to hypertension. It tells that current smokers have a lower prevalence of hypertension. On the other hand, non current smokers appear to be have a greater prevalence of hypertension. Furthermore the difference is significant. This is due to temporality and survival bias. Survival bias on the other hand, means that it is possible that smokers, having shorter lifespan, do not develop hypertension before they succumb to other smoking related diseases.¹⁵

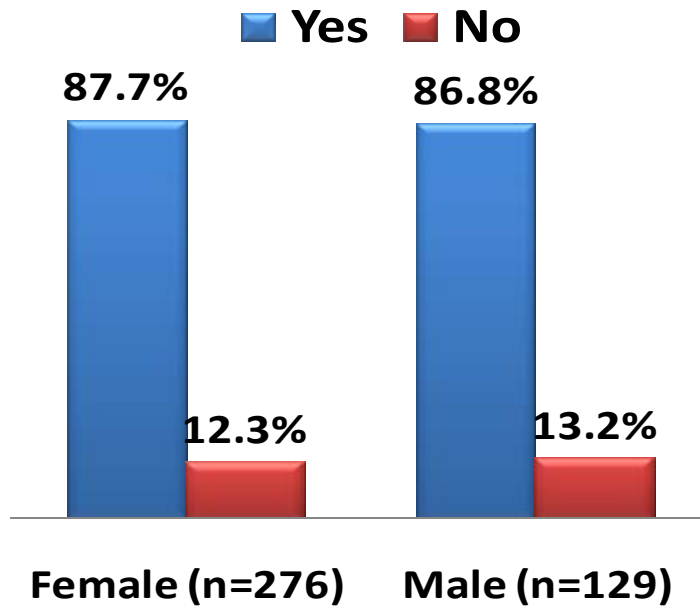
Awareness Among Hypertensives



$p < 0.05$

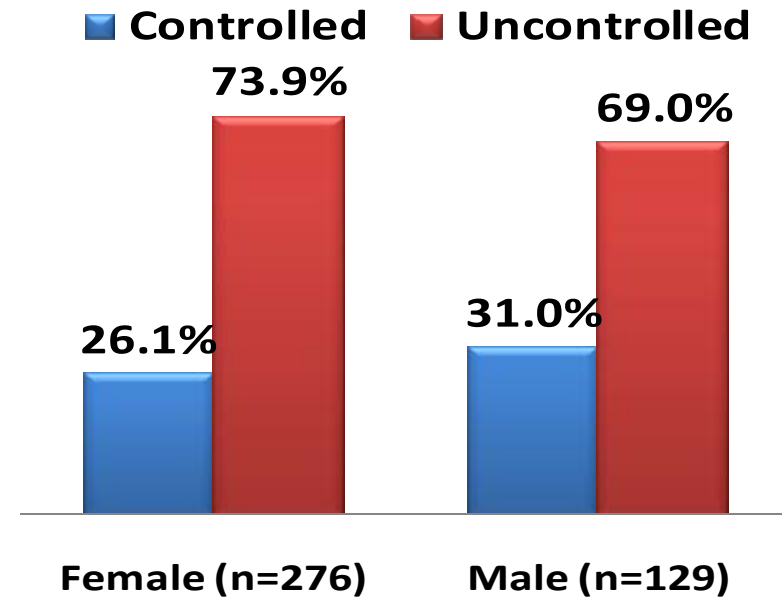
From the bar chart, very unfortunately, that about $\frac{1}{2}$ the hypertensive respondents were aware they had hypertension. Females fared better with only 44.3% being unaware they had hypertension, while more than 60% the male hypertensives were unaware they had hypertension.

Treatment Among Aware Hypertensives



$p > 0.05$

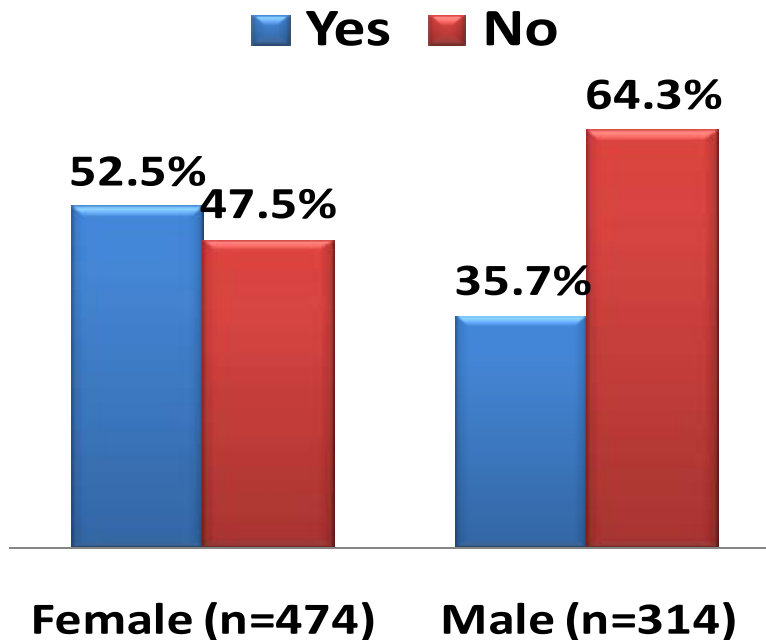
Control of BP Among Aware Hypertensives



$p > 0.05$

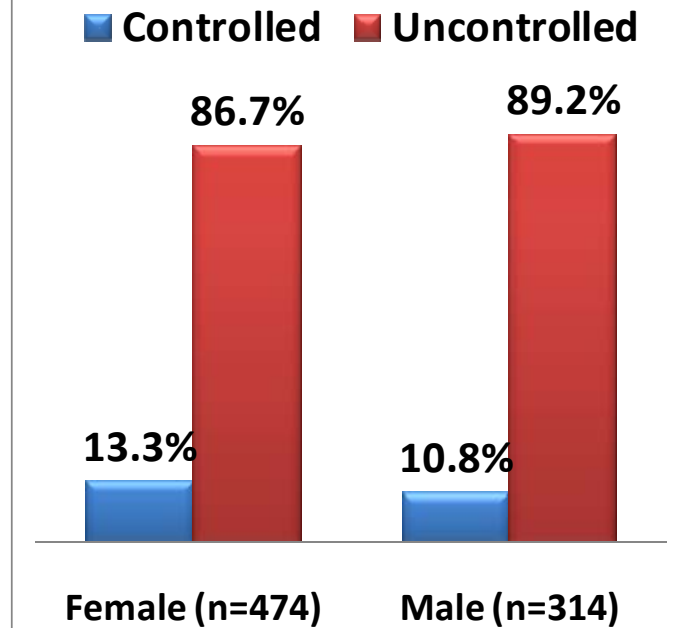
Bar chart shows among those who were aware, the control of blood pressure was better, at 26% for the females and 31% for the males. However, this is distressing, as almost 90% of those who were aware had received treatment, yet only close to 30% had their blood pressure under control.

Treatment Among Hypertensives



$p < 0.05$

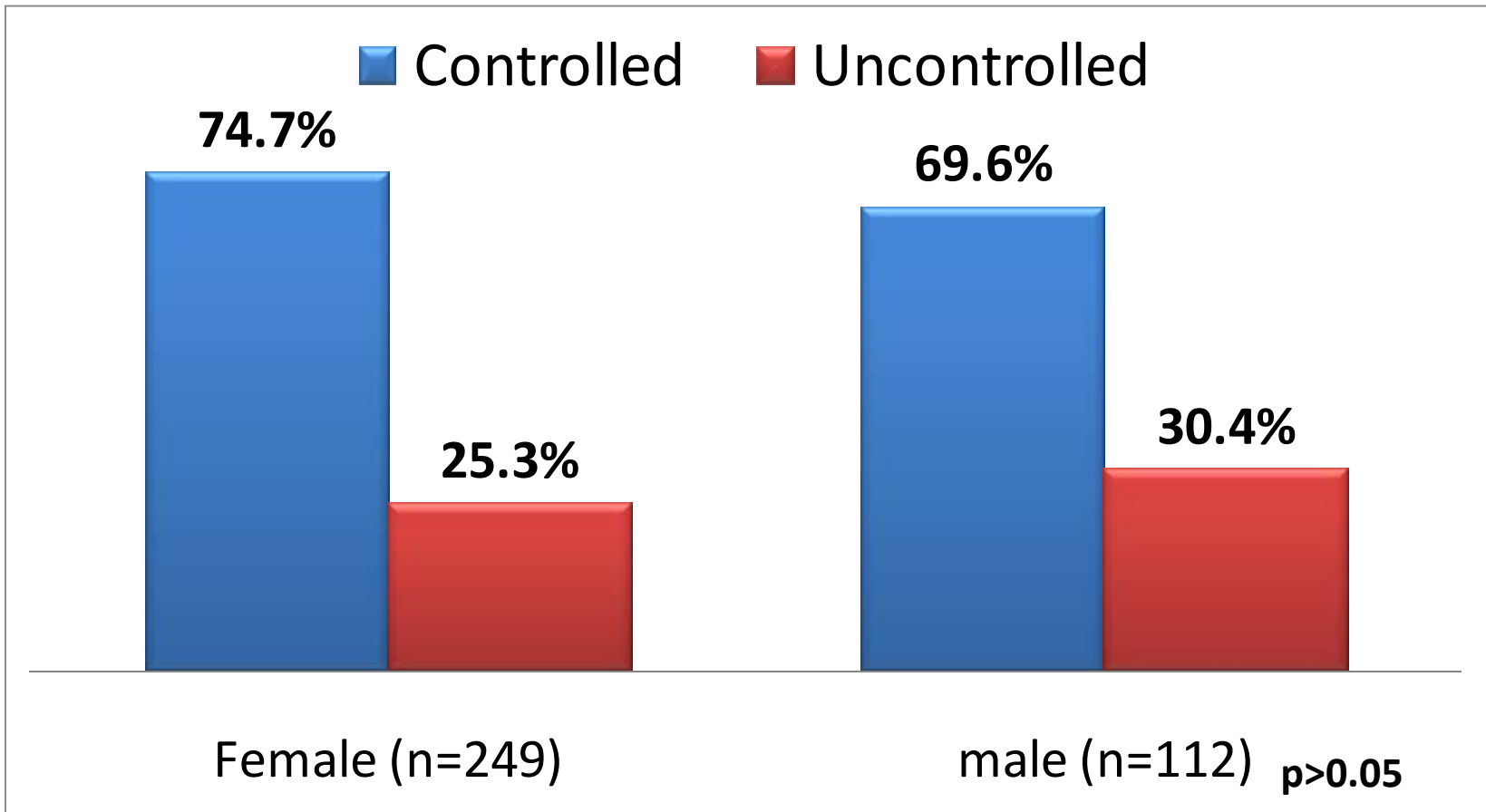
Control of BP Among Hypertensives



$p > 0.05$

Graph shows the treatment among the total hypertensives and control of their blood pressure. Chart on the left, more than 50% of female respondents and about 35% of male respondents undergo treatment for hypertension but unfortunately almost 90% of both respondents had uncontrolled blood pressure.

Control of BP among Treated



The chart shows the control of blood pressure among those who were treated and almost 30% of the respondents who were treated still had an uncontrolled blood pressure.

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