

The Effect of Papaya (*Carica papaya*) Juice on Body Weights of The Municipal Police Officers in Ternate (Polres Ternate)

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Background: Overweight and obesity issue occur in Municipal Police Officers in Ternate (Polres Ternate). A pilot study has been done in Polres Ternate and found that there were 70 cases of overweight Police Officers. According to the attending health care profession, the treatment of those overweight cases had been done through exercise but without diet management.

This is an experimental study with pre- and post-test in both control and intervention group. Population in this study was 70 Overweight Municipal Police Officers in Ternate (Polres Ternate). The sample size in this study was 30 respondents which were randomly selected and divided into 15 in each of intervention and control group. Intervention group was given papaya juice while control group was given placebo for 60 days.

The results show that there was significant different body weight between before and after intervention in intervention group but there was non-significant different body weight between before and after intervention in control group. There was non-significant different body weight between intervention group and control group after intervention.

Body weight loss happened in intervention group which caused by papaya juice administration together with the education and motivation of the respondents. Nevertheless, there was no significant different between intervention group and control group after intervention.

Key Words: Pepaya Juice, Body Weights, Members of Ternate City Police Resort. **Bibliography :** 39 (1990-2018)

Introduction

Obesity has become one of the main global problems which remains unsolved with high risk of complications of non-communicable diseases from adult to elderly. The prevalence of overweight and obesity for people aged >18 years old in Indonesia in 2013 were 13.5% and 15.4%, respectively. It was higher than the prevalence of overweight and obesity in 2007 with 13.9% and 7.8%, respectively.

North Maluku, is one of the sixteen provinces with higher prevalence of overweight and obesity than national level.

Overweight occurs in Police Officers in many ways. Kurniawati et al (2016) in their study in Municipal Police Officers in Banjarmasin City found that there was 10.32% of obese police and that eating habit, physical activity and sleep duration were associated with obesity. Herliani in 2015 also found that among ten policemen, there were 4 with obesity and 3 with overweight which caused by total energy intake and physical activity.

Dietary fiber plays an important role in body health. High fiber diet can be used to treat obesity as it can effectively reduce body weight (Tatang 2011). The requirement of fiber can be fulfilled by consuming fruits and vegetables. High fiber juice is one of the ways to do high fiber diet which contains fruits, vegetables, or combined. Papaya is one of the high fiber fruits which can be used to make juice. One small size of papaya can provide 11% of fiber requirements (Hayudanti et al, 2016).

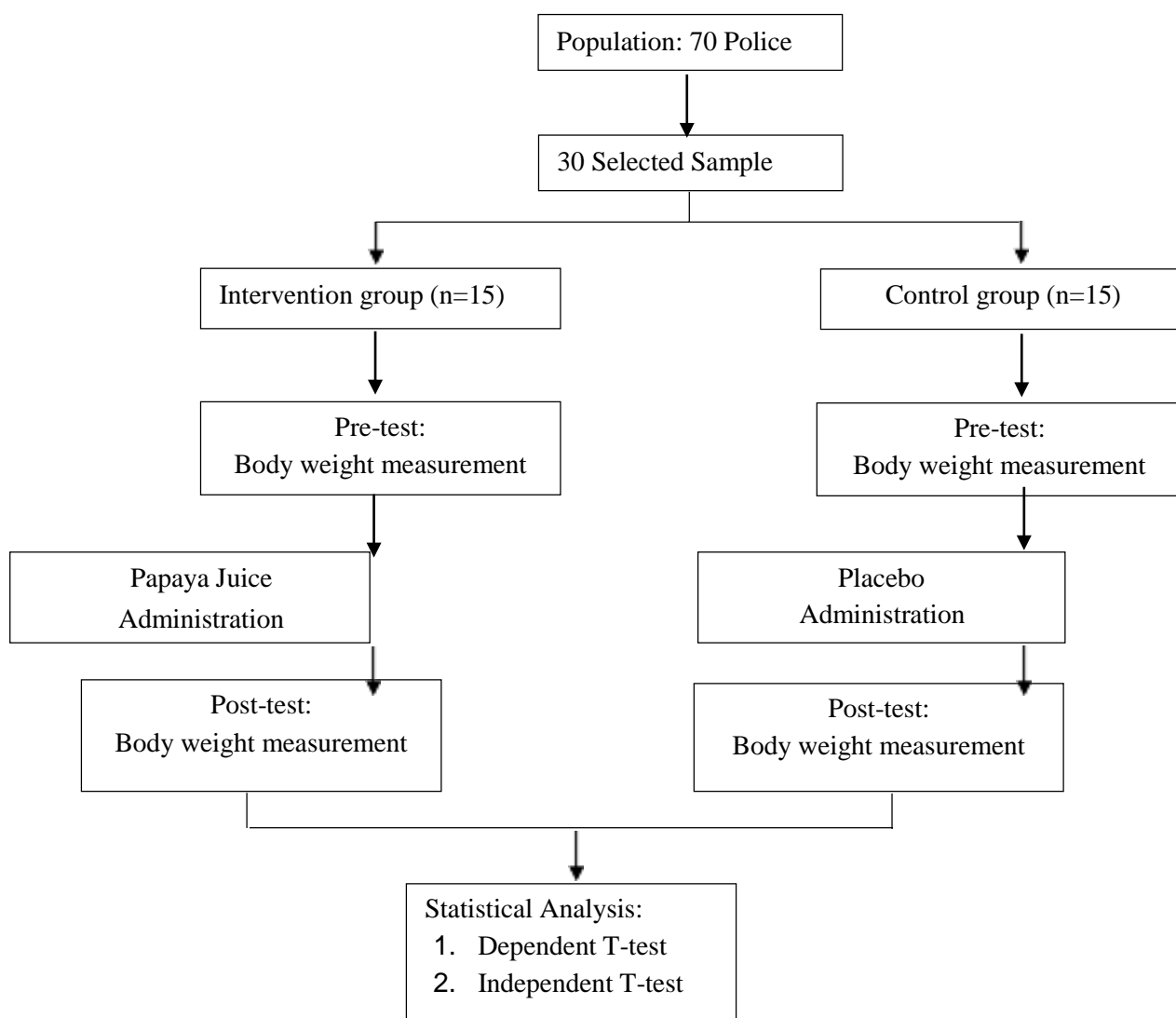
Overweight and obesity issue occur in Municipal Police Officers in Ternate (Polres Ternate). A pilot study has been done in Polres Ternate and found that there were 70 cases of overweight Police Officers. According to the attending health care profession, the treatment of those overweight cases had been done through

exercise but without diet management. Therefore, the absence of diet management could be one of the causes of ineffective result of overweight treatment. Thus, it is considered interesting to study the effect intervention of papaya (*carica papaya*) juice on body weights of the overweight Municipal Police Officers in Ternate (Polres Ternate).

Methods

This is an experimental study with pre- and post-test in both control and intervention group. Population in this study was 70 Overweight Municipal Police Officers in Ternate (Polres Ternate). The sample size in this study was 30 respondents which were randomly selected and divided into 15 in each of intervention and control group. Intervention group was given papaya juice while control group was given placebo for 60 days.

Study design



Results

1. Characteristic of Respondents

The characteristic of respondents based on age, gender, body weight (before and after intervention), and energy intake (before and after intervention) were displayed in the table 1.

Table 1. Characteristic of Respondents in Intervention Group and Control Group

Variable	Intervention		Control	
	n	%	n	%
Age (year)				
21 – 25	0	0	2	13,3
26 – 30	4	26,7	4	26,7
31 – 35	5	33,3	2	13,3
36 – 40	1	6,7	4	26,7
41 – 45	2	13,3	2	13,3
46 – 50	1	6,7	0	0
51 – 55	1	6,7	1	6,7
56 – 60	1	6,7	0	0
Total	15	100,0	15	100,0
Gender				
Male	13	86,7	14	93,3
Female	2	13,3	1	6,7
Total	15	100,0	15	100,0
Body weight before intervention (kg)				
70,00 – 75,99	2	13,3	0	0
76,00 – 80,99	2	13,3	6	40,0
81,00 – 85,99	2	13,3	3	20,0
86,00 – 90,99	4	26,7	2	13,3
91,00 – 95,99	3	20,0	2	13,3
96,00 – 100,99	2	13,0	1	6,7
101,00 – 105,99	0	0	1	6,7
Total	15	100,0	15	100,0
Body weight after intervention (kg)				
60,00 – 65,99	0	0	0	0,0
66,00 – 70,99	2	13,3	0	0,0
71,00 - 75,99	3	20,0	0	0,0
76,00 – 80,99	1	6,7	5	33,3
81,00 – 85,99	6	40,0	4	26,7
86,00 – 89,99	1	6,7	1	6,7
90,00 – 95,99	2	13,3	3	20,0
96,00 – 100,99	0	0,0	2	13,3
Total	15	100,0	15	100,0
Energy intake before intervention				
Inadequate	0	0,0	0	0,0
Adequate	0	0,0	3	20,0
Excess	15	100,0	12	80,0
Total	15	100,0	15	100,0
Energy intake after intervention				
Inadequate	0	0,0	0	0,0
Adequate	15	100,0	3	20,0
Excess	0	0,0	12	80,0
Total	15	100,0	15	100,0

In intervention group, there was 33.3% respondents aged 31-35 years old, 26.7% respondents aged 26-30 years old, and 13.3% respondents aged 41-45 years

old. Meanwhile, in control group, there was 26.7% respondents in both aged 26-30 years old and aged 36-40 years old, and 13.3% respondents in those aged 21-25 years old, 31-35 years old, and 41-45 years old. In intervention group, most of the respondents (86.7%) were male and the rest (13.3%) were female, similar to the control group with the most respondents were male (93.3%) and the rest were female (6.7%).

Body weight data shows that before intervention, most of the respondents in intervention group (26.7%) weighed 86.00-90.99 kg, while most of the respondents in control group (40.0%) weighed 76.00-80.99 kg. After intervention, most of the respondents in intervention group (40%) weighed 76.00-80.99 kg while most of the respondents in control group (33.3%) weighed 76.00-80.99 kg.

In intake data, before intervention, all of the respondents in intervention group (100%) had excess daily

intake of energy, while in control group there was 80% respondents had excess daily energi intake and 20% respondents had adequate daily energy intake. After intervention, all of the respondents (100%) had adequate daily energy intake, while most of the respondents in control group (80%) had excess daily energy intake and another 20% respondents had adequate daily energy intake.

2. Body Weight Change

Body weight change was obtain by subtract the data after intervention to the data before intervention. The data about body weight change was displayed in table 2. As displayed, all respondents in intervention group experienced body weight loss, while most of the respondents in control group (66.7%) experienced body weight stagnation and the others (33.3%) experienced body weight gain.

Table 2. Body Weight Change in Intervention Group and Control Group

Body Weight Change	Intervention		Control	
	n	%	n	%
Decrement				
0,01 – 0,99	0	0,0	0	0,0
1,00 – 2,99	1	6,7	0	0,0
3,00 – 4,99	1	6,7	0	0,0
5,00 – 6,99	9	60,0	0	0,0
7,00 – 8,99	4	26,7	0	0,0
Stagnation	0	0	10	66,7
Increment				
0,01 – 0,99	0	0,0	4	33,3
1,00 - 2,99	0	0,0	0	0
3,00 – 4,99	0	0,0	0	0
5,00 – 6,99	0	0,0	1	6,7
7,00 – 8,99	0	0,0	0	0,0
Total	0	0,00	15	100,0

3. Body Mass Index

The data in table 3 shows the BMI of the respondents before and after intervention. Before intervention, in intervention group, there was one respondent (6.7%) with overweight, 7 respondents (46.7%) with obese I, and 7 respondents (46.7%) with obese II. Meanwhile, in control group, there was 7 respondents (46.7%) with obese I and 8 respondents (53.3%) with obese II.

Tabel 3. Body Mass Index in Intervention Group and Control Group

BMI	Intervention			Control		
	n	%	Mean	n	%	Mean
Before Intervention						
Normal	0	0,0	0,0	0	0	0
Overweight	1	6,7	24,4	0	0	0
Obese I	7	46,7	28,5	7	46,7	28,4
Obese II	7	46,7	33,0	8	53,3	33,1
Total	15	100,0		15	100,0	
After Intervention						
Normal	1	6,7	23,1	0	0	0
Overweight	0	0	0	1	6,7	26,0
Obese I	9	60,0	27,9	6	40,0	28,6
Obese II	5	33,3	33,3	8	53,3	29,4
Total	15	100,0		15	100,0	

After intervention, in intervention group there was one respondent (6.7%) with normal BMI, 9 respondents (60%) with obese I, and 5 respondents (33.3%) with obese II. Meanwhile, in control group, there was one respondent (6.7%) with overweight, 6 respondents (40%) with obese I, and 8 respondents (53.3%) with obese II.

4. Normality Test

In order to understand whether the data was normally distributed or not, *Kolmogorov Smirnov Test* was done to find the answer. The results in table 4 shows that all the value were lower than p value (<0.05) which means that the data was normally distributed. Thus, the data was eligible to be analysed by using t-test.

Table 4. Distribusi Frekuensi Responden Berdasarkan Nilai Kenormalan data Berat Badan Awal dan Akhir

Kolmogrov-Smirnov Test	Intervention		Control	
	BW Before	BW After	BW Before	BW After
Asymp. Sig. (2-tailed)	0,977	0,674	0,568	0,493

5. Pre- and Post-Test Analysis

Table 5. Pre- and Post-Test Body Weight Analysis in Intervention Group and Control Group

Paired Samples t Test	Paired Differences			T	df	Sig. P
	Mean	Std. Deviation	d. Error Mean			
Intervention Group	5,39867	1,62493	,41955	12,868	14	,000
Control Group	-49,552	190,2096	49,1119	-1,009	14	,330

As shown in table 5, body weight before and after intervention were significantly different in intervention group ($p < 0.05$). Meanwhile, in control group, body weight before and after intervention were not significantly different ($p > 0.05$). These results confirm that the administration of papaya juice decreased body weight while the administration of placebo could not decrease the body weight.

6. Analysis of Difference between Intervention Group and Control Group

The result of analysis of difference between intervention and control group is displayed in table 6. As displayed, the result from independent t-test shows that the obtained p value was 0.075 (>0.05). This means that body weight of the respondents after intervention between intervention group and control group were not significantly different between Intervention Group and Control Group after Intervention

Independent Samples t Test		Paired Differences		t	df	Sig. P
		Mean difference	Std. Error Mean			
BB	Equal variances assumed	-5.61667	3.03338	-1.852	28	.075
	Equal variances not assumed	-5.61667	3.03338	-1.852	27.594	.075

DISCUSSION

In the beginning, before intervention, almost all of the respondents in intervention group were obese and only one who was overweight. After intervention for two months (60 days), all of the respondents had the body weight significantly decreased according to *paired t-test* result ($p < 0.05$). The normal range of body weight loss was 0.5-1 kg within a week or 2-4 kg within a month. Those who gradually decreasing their body weight according to those normal value were likely to be able to maintain their body weight (Almatsier, 2004; CDC, 2015).

Body weight loss affects BMI score, as the BMI of one respondent declined into the normal range and the BMI of the other 14 respondents also declined, yet still in obese category.

The result of body weight loss could be caused by the decrement of energy intake which was confirmed by drop of mean energy intake from excess ($>110\%$) to adequate (90-110%). The decrement of respondents intake itself were caused by the fiber content in papaya juice by triggering satiety. Soluble fiber such as pectin and some hemicellulose have the ability to hold the water and form the thick fluid in intestinal tract (Rahma, 2014). Food with high fiber content have low calorie, low sugar and low fat which can reduce body weight of obese people (Santoso, 2011; Rahma, 2014). Turner et al (2013) in their study found that consumption of high fiber food can lower the mean of calorie intake from 1646 kcal to 1387 kcal. Nevertheless, Lofgren (2002) found that body weight loss also caused by water releasing and glycogen depletion within first two weeks. When body weight depleted, it was likely to be caused by water and fat depletion by 55-65% and 30-40%, respectively (Nix, 2004).

Diet education through counseling also one of the factors that change respondents perspective about high fiber diet by consuming fruits and vegetables to decrease body weight. Besides, most of the respondents do physical activity once a week. Kustiani (2015) revealed that intervention of fruit consumption, nutrition education and physical activity were significantly affecting body weight loss. Another factor that affected the compliance of the respondents was the order from their boss. Thus, all of the respondents were well motivated to join this research for 60 days (2 months).

Respondents in control group was given placebo with the result shows that there was none significantly different between before and after intervention ($p>0.05$). There was 66.7% respondents who did not experience body weight change and the rest did experience body weight gain. Accordingly, the respondents energy intake was also none significantly different with three of them were adequate and the rest was excessive, as well as respondents BMI which also did not change with most of them were obesity.

Continuous excess energy intake together with low physical activity level are the key factors to obesity. Middlemiss et al (2016) stated that our body always attempt to achieve the energy balance through various physiology responses. The body will try to compromise and do some adjustment when it has an excess energy intake. Nevertheless, this mechanism has the limit, then when excess intake goes beyond the limit, the body will start to gain.

Respondents in this research were range from early adult to adult. Most of respondents in control group were in early adult age. At this age, respondents are likely at their peak level with physiology metabolism getting slower due to the alteration of hormones activities, as well as physical activities which eventually lead to body weight gain (Brown 2008). Sudikno et al (2016) in their study found that the type of obesity in adult aged 25-26 years old was central obesity with the risk factors as follow: age, living place, socioeconomic status, and physical activity. Another study also found that there was a significant relationship between obesity and age. In age ≥ 40 years old, *Resting Metabolic Rate* (RMR) will decrease along with muscle mass in low physical activity (Nurzakiah et al, 2010).

The result of analysis between intervention group and control group after intervention shows that there was not significant different between both group after intervention ($p>0.05$). This finding might be caused by the body weight loss in intervention group was just in small amount and some of the respondents were still obese. Nonetheless, the given intervention could led to body weight loss during 2 months which confirms that the expected result was there.

Conclusion

Body weight loss happened in intervention group which caused by papaya juice administration together with the education and motivation of the respondents. Nevertheless, there was no significant different between intervention group and control group after intervention.

Recommendation

It is important to conduct further study to analyse deeper about diet education to lose body weight and it is important to the respondents to keep consuming papaya fruit either in juice or fresh and another type of fruits to have high fiber intake and help control body weight.

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