

## Implementation of Wellness Program Model for Decreasing of Metabolic Syndrome Risk and Increasing Work Productivity of Government Employee in Bali Province

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### ABSTRACT

Health development as an investment to improve the quality of human resources. Unhealthy lifestyles such as lack of exercise, unbalance diet, excessive workloads can cause of degenerative diseases and decreasing of physical fitness and productivity. This study aims to implement of Wellness Program to reduce of BMI (overweight and obesity) and Blood Pressure as a risk of metabolic syndrome, decreasing of body fat and enhance of work productivity for government employee. This study was experimental designed with control group and treatment group. The group was randomly from the government employee in Denpasar City and Gianyar Regency. The treatment group was given the implementation of Wellness Program such as nutrition education, physical exercise regularly and giving healthy juice before and after exercise among 2 month or 8 weeks. This research was to find out the difference effect of treatment in the two groups (pre and posttest), The data were analyzed descriptively and a different test using a statistical test independent samples t-test at a significance level of  $> 0.05$  on homogeneous data and the Man Whitney test on inhomogeneous data. The results showed that the average of blood pressure in treatment group was  $123.25 + 13,328$  mmHg vs  $131.75 + 14.656$  mmHg in control group. There was a significant difference based on t-independent test obtained  $p < 0.05$ . The nutritional status data based on BMI average showed that treatment group was lower than the Control Group i.e.,  $25.37 + 2.98$  kg/m<sup>2</sup> vs  $26.28 + 3.35$  kg/m<sup>2</sup> but there was no significant difference with  $p = 0,202$  ( $p > 0.05$ ). The average of body fat composition showed that treatment group was  $25.4225 + 6.71\%$  lower than the Control Group was  $28.15 + 8.33\%$  but there was no significant difference with  $p = 0,111$  ( $p > 0.05$ ). The average of work productivity the treatment group was higher than control group. The data showed  $98,95 + 3,36\%$  work productivity in treatment group vs  $94,79 + 5,23\%$  in control group. Based on t-independent test showed that there was significant difference work productivity with  $p = 0,001$  ( $p < 0,05$ ).

### 1. Introduction

One of the advantages for national development is the influence of development results. The Human Development Index measures health development as an investment to raise the standard of human resources (HDI). By enhancing the quality of human resources, health development strategies to raise HDI are carried out. This makes people more capable, autonomous, and able to compete in the face of fierce free competition in the globalization period. Indonesia is currently dealing with a double burden of disease. High rates of non-communicable diseases like hypertension, heart disease, cancer, and diabetes mellitus have followed the high rates of communicable diseases. The noncommunicable illnesses that increase a person's risk of developing metabolic syndrome (Zahtamal et al., 2014), discovered that the prevalence of metabolic syndrome was 21.58%, with men making up the majority of the age groups and being over 50 years old.

Blood pressure and belly circumference are the two most typical components of metabolic syndrome cases, which often include three components. According to the findings of a study done in Bali, the prevalence of metabolic syndrome in men is 11.28% and in women it is 20.38%, therefore the number of people with the condition is rising. (Wiardani and Juniarsana, 2011). The state of this metabolic syndrome occurs in many productive ages, of course, it greatly affects work productivity. Excessive eating patterns that are not supported by sufficient activity can cause obesity which has implications for the occurrence of metabolic syndrome, especially in the productive age, which will certainly affect productivity. In addition to physical health problems, what is no less important is the approach from a psychological aspect which is also an important part of health so that human resources, especially ASN, can work well. These physical, mental and lifestyle conditions have an impact on the health of ASN and will certainly affect the level of productivity (WHO, 2006). Health promotion programs for workers should focus on the overall physical and mental health of an ASN. It is necessary to design a holistic program to help prevent or improve health problems for ASN, which is better known as the *Wellness Program*. The designed program includes not only disease identification but also lifestyle modification. This program is the identification and control of diseases related to metabolic syndrome, nutrition regulation, physical exercise for workers especially to government employee.

## **2. Research Methods**

This research is a *true experimental* with a *Randomized Pre-Test-Post Test Control Group Design* (Pocock, 2008; Suryabrata, 2006). The research was carried out in government employee in Bali Province with length of intervention among 2 months or 8 weeks. In this research, we look for decreasing of metabolic syndrome risk such as BMI (indicate of overweight or obesity), high blood pressure, body fat composition and work productivity. Subjects were grouped randomly and divided into control group and treatment group. The population of this research are government employee in Bali province was taken from 2 districts/cities i.e Denpasar City Government and the Gianyar Regency Government. The sample size in this study was 80 people consisting of 40 each people for the control group and the treatment group. The inclusion criteria were male and female, registered as government employee in Government of Denpasar City and Gianyar Regency, aged 30 - 55 years, domiciled in the Denpasar City and Gianyar Regency and willing to be researched (Wiardani and Juniarsana, 2011).

The Treatment Group was the subject who was given the implementation of the *Wellness Program* approach for 8 weeks and the control group was subject who was not given of *Wellness Program* implementation. The data collected was subject characteristic by interview using a sample identity form. Metabolic Syndrome Metabolic Syndrome risk data was collected by measuring blood pressure using a blood pressure meter and to determine obesity status by weighing using Tanita scale, measuring height using a microtoise. Measurement of physical fitness is by using the physical exercise method of running 12 minutes. Body fat composition was obtained by measuring using a siomi digital scale. Work Productivity data were collected through work productivity questionnaire by the manager of each government employee with a likert scale. The normality test of the data was carried out using the *Kolmogorov Smirnov test* on the research variables including; age, weight, height and BMI. Before the data was tested for differences between the two groups, the data were tested for homogeneity. If the data is homogeneous then it is continued with the *t-independent test*, whereas if the data is not homogeneous then the *Man Whitney*.

## **3. Results and Discussion**

### **3.1 Subject Characteristics**

The research subjects were government employee who worked in the Denpasar City Government and Gianyar Regency. The total number of research subjects was 80 people who came from 2 (two) selected agency locations in Bali Province, namely the PUPR office Denpasar City and BPKAD office in Gianyar Regency. Based on the subject characterize were male 29 persons (72%) and female 11 persons (27,5%) in the treatment group. Subject in the control group were male 31 persons (77.5%) and female 9 persons (22,5%). The average age of the subjects in the treatment group was 46.93 years ( $\pm$  8.5 years), with the highest age being 57 years and the lowest age being 22 years. While the average age of the subjects in the control group was 48.1 years (6.3 years), the highest was 57 years and the lowest was 27 years. The level of education in the treatment group was 19 people (47.5%), while the control group had the most undergraduate education (S1) as many as 15 people (37.5%).

### **3.2 Wellness Program Implementation**

Wellness Programs are implemented in therapy groups including 1) educating people about nutrition (balanced diet, nutrition counseling). The subjects who received diet counseling received advice on how to lose weight if they were obese or overweight, how to manage diabetes if their blood sugar levels were above 140 mg/dl, how to manage high cholesterol if their levels were above 200 mg/dl, and how to manage hypertension if their blood pressure was above 140/90 mmHg. 2. controlling physical activity using the FITT idea (frequency, intensity, time and type). 3 to 5 times a week, for 45 to 60 minutes, with moderate effort and a heart rate of 60 to 85% of one's maximum heart rate, 3. continuing to provide healthy juice in their homes while they exercise, once every two weeks, before and after, 4) Limiting the amount of smoking.

### 3.3. Syndrome Metabolic Risk

#### a. Nutritional Status

Nutritional status data was obtained using the criteria for Body Mass Index (BMI). The nutritional status of subjects in both groups was normal, overweight (overweight) and obese (overweight) and there was no undernutrition status in both groups. Based on the results of anthropometric measurement can be seen in the following figure.

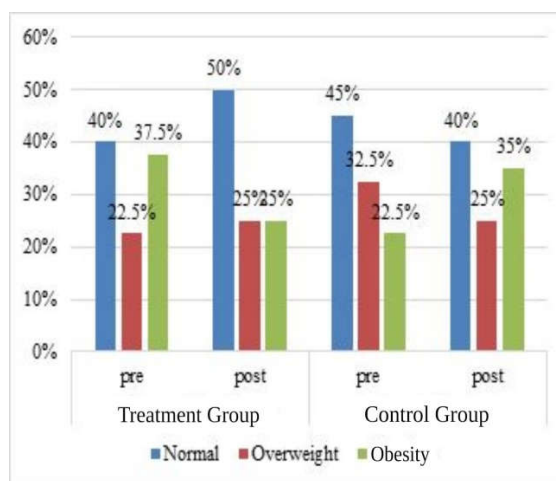


Figure 1. Distribution of Samples Based on Nutritional Status

The figure above showed there is a tendency for the number of obese people in the treatment group from 15 people (37.5%) to 10 people (25%) while in the control group there was an increase in the number of obese people from 9 people (22.5%) to 14 people (35%). In the treatment group, there tended to be an increase in subjects who showed normal nutritional status from 16 people (40%) to 20 people (50%) while in the control group there was a decrease in the number of subjects who had normal nutritional status, from 18 people (45%) to 16 people (40%). The average of Body Mass Index showed that the treatment group was lower than control group, there are  $25.37 \pm 2.98$  kg/m<sup>2</sup> in treatment group and  $26.28 \pm 3.35$  kg/m<sup>2</sup> in control group. The tendency decreasing number of obesities in treatment subject causes by energy consumption in treatment group was lower than control group. The decreasing of obesity category in treatment group causes by energy consumption level in treatment group lower than control group. The average of energy consumption was  $75.79\% \pm 18.15\%$  in treatment group and  $100.10\% \pm 41.02\%$  in control group. According to Man Whitney statistical analysis showed there was significant difference energy consumption level between of two group with p value = 0,001 (p<0,05). Decreasing of energy consumption level in treatment group causes by decreasing 500 – 1000 kcal from their daily consumption for reducing of weight ½ - 1 kg per weeks for obesity subject. This purpose was giving continuously with nutrition counseling in wellness program implementation in treatment group among 8 weeks. Nutrition counseling plays a role in increasing the driving factor by

providing material and motivation to behave in a healthy manner while reducing the restraining factor by convincing the subject that they can make behavioral changes through simple steps (Ranitadewi, Syauqi and Wijayanti, 2018). One of the nutritional counseling materials given to this treatment group is in the form of an effort to lead to a nutritional status that is towards normal numbers by reducing energy consumption by 500-1000 kcal in subjects who are *overweight* and obese. In this study, there was no difference in nutritional status between the treatment and control ( $p>0,05$ ) because changes in nutritional status cannot occur in a short period (2 months or 8 weeks). This study in line with Kim et al.,(2017) conducted in Korea with a nutrition education intervention for 10 weeks, there was no significant effect on both BMI and percent body fat. According to Gifari et al.,(2021) changes and improvements in nutritional status are effective for 12 weeks by providing a combination of exercise and nutritional counseling.

**b. Blood Pressure**

Obesity and high blood pressure are often found in someone with metabolic syndrome disorders. Based on the results of blood pressure measurements in the two groups, it can be seen in the following table 1.

**Table 1.**  
Distribution of Blood Pressure Measurement Results (mmHg)

Categori	Treatment Group				Control Group			
	Pre		Post		Pre		Post	
	f	%	f	%	f	%	f	%
Normal	7	17,5	7	17,5	4	10	2	5
Pre Hypertension	9	22,5	14	35	11	27,5	10	25
Hypertension Level 1	13	32,5	19	47,5	19	47,5	18	45
Hypertension Level2	11	27,5	0	0	6	15	10	25
Total	40	100	40	100	40	100	40	100

Source: Hypertension Clasification by JNC-VII 2003

Based on table 1 showed that most of the subjects had hypertension level 1 category. In treatment group for in hypertension level 2 category, there was a decrease after the implementation of the Wellness Program compared in control group. The average of blood pressure after intervention was  $123.25 \pm 13.32$  mmHg in treatment group and  $131.75 \pm 14.65$  mmHg in control group. The average of blood pressure in treatment group was lower than control group. Based on t-independent analysis showed there was significant different blood pressure in two group with  $p=0,008$  ( $p<0,05$ ). The average of blood pressure in subjects who received wellness program implementation influence by nutrition counseling effect by hypertension diet for controlling the sodium and fat consumption in their eating patten regularly. The application of physical exercise regularly in treatment group has a positive impact for people who suffered of hypertension. Regular physical exercise in adults with hypertension can affect all levels of systolic blood pressure (Simanjuntak and Hasibuan, 2022). The mechanism of lowering blood pressure occurs after the individual do regular exercise due to decrease in vasopressin, an increase in the efficiency of the heart work, and a decrease in sympathetic activity. As a result of a decrease in vasopressin and an increase in the efficiency of the heart work that causes a decrease in cardiac output followed by a decrease in systolic blood pressure. Decreasing of sympathetic activity causes vasodilation of blood vessels, and total peripheral resistance is followed by a decrease in diastolic blood pressure (Rohimah and Dewi, 2022). In addition, doing physical exercise can reduce the work of the sympathetic nerves, healthier blood vessels to avoid oxidative stress and inflammation, suppress renin activity so that blood vessels are vasodilated and blood pressure drops (Wedri, Windayanti and Ari Rasdini, 2021).

**c. Blood sugar level**

The results of random blood sugar levels in the treatment group and control group can be seen in the following figure 2 below.

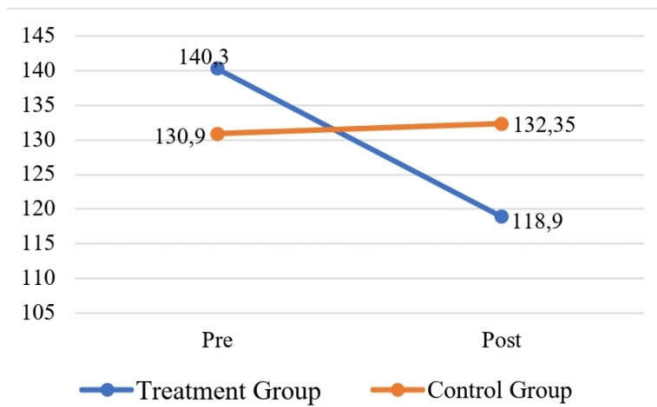


Figure 2. Average of blood sugar levels

The treatment group decrease sharply from  $140.3 \pm 82.89$  mg/dl to  $118.90 \pm 53.27$  mg/dl which indicated a change from high blood sugar level ( $>140$  mg/dl) to normal category ( $<140$  mg/dl). On the other hand, in the control group increased slightly from  $130.9 \pm 56.81$  mg/dl to  $132.35 \pm 54.72$  mg/dl but still in normal category. The results of t-independent analysis showed there was no significant difference in the average of blood sugar levels between the treatment and control groups with  $p=0.269$  ( $p>0.05$ ). The implementation wellness program for doing of physical activity or exercise 5-30 minutes a day can reduce blood sugar levels, fat deposits, and blood pressure (Mamo et al., 2019). Physical activity will greatly affect blood sugar levels because when someone does physical activity there will be an increase in the use of glucose by active muscles so that it can directly cause a decrease in the amount of blood sugar levels in the body, the more routine a person do of physical activity, the blood sugar levels in a person will also decrease and will be controlled day by day (Hariawan et al., 2019).

#### d. Cholesterol level

The average results of cholesterol levels in the two groups showed that they were on the border line which led to normal cholesterol levels  $<200$  mg/dl. The average of cholesterol level (Figure 3) measurement results can be seen in the image below.

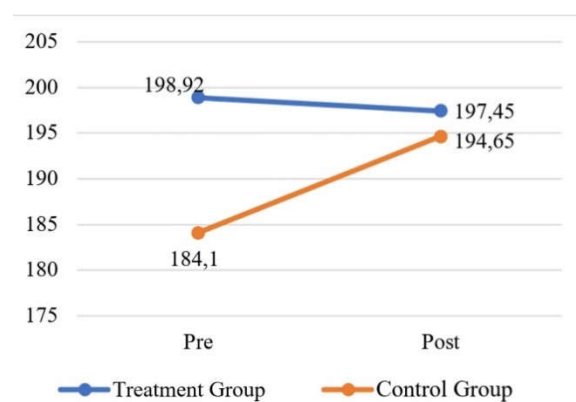


Figure 3. The average of Cholesterol level

The average in the treatment group was  $198.92 \pm 43.19$  mg/dl decreased after being given the wellness program intervention to  $197.45 \pm 35.22$  mg/dl. While the mean in the control group was  $184.10 \pm 35.51$  (pretest) increased to  $194.65 \pm 34.44$  mg/dl (posttest). Cholesterol levels in the treatment group were lower than the control group, this was evidenced by the lower amount of fat consumption based on the 24-hour recall of food consumption on fat intake. In the treatment group, they did not consume a lot of foods containing cholesterol and processed food without the frying process. Excessive fat consumption will increase fat levels which can lead to atherosclerosis which in turn can cause an increase in blood pressure (Castro-Torres & Katholi, 2015). The average level of fat consumption in the treatment group was  $107.45 \pm 18.15\%$  compared to the control group of  $119.91 \pm 41.02\%$  although it was not significantly difference with  $p$  value = 0.276 ( $p > 0.05$ ).

The results of the effort to implement nutritional counseling given to the treatment group as part of the Wellnes program showed that there was no significant difference in the level of fat and carbohydrate consumption between the treatment group and the control group. This relates to the subject's recognition of eating habits that cannot be changed in a short time and needs to be done gradually. This study is in line with the research of Hasniyati and Ismanilda, (2021) that the provision of nutritional counseling can change eating behavior based on energy intake and not with carbohydrate or fat consumption. According to Gifari, (2021) intake is influenced by two factors such as food choices from family members and external factors from office friends. However, the distribution of the level of consumption of fat showed a better change, which indicated that the subject was able to change the consumption pattern in accordance with the recommendations in nutritional counseling although with a small percentage.

### 3.4 Work Productivity

Work productivity is a way of working or work methods, ways or work methods of employees in carrying out their work duties can be seen through the willingness of employees to work effectively and efficiently (Siagian, 2003). In this study, assessment of work productivity is carried out by the supervisor of each employee in their department. The supervisor will assess their employee by using questionnaire. The average of work productivity for both group after 8 weeks intervention showed that treatment group has work productivity level higher than control group. The work productivity in treatment group was  $98,95 + 3,36$  % and  $94,79 + 5,23$  % in control group. According to Man Whitney analysis showed that there are significant difference between treatment group and control group with  $p$  value = 0,001 ( $p < 0,05$ ). Work productivity is influenced by various factors, one of them is the quality and physical ability (physical fitness) of employees. There are some efforts to increase of physical fitness in the form of a Wellness Program implementation emphasizes 3 aspects such as balanced nutrition and diet counseling according to the risk of metabolic syndrome and regulating physical exercise according to the FITT concept (frequency, intensity, time and type). Evaluating of physical fitness in this study using of 12-minute run method. The results of 12-minute running distance can be seen in Figure 4.

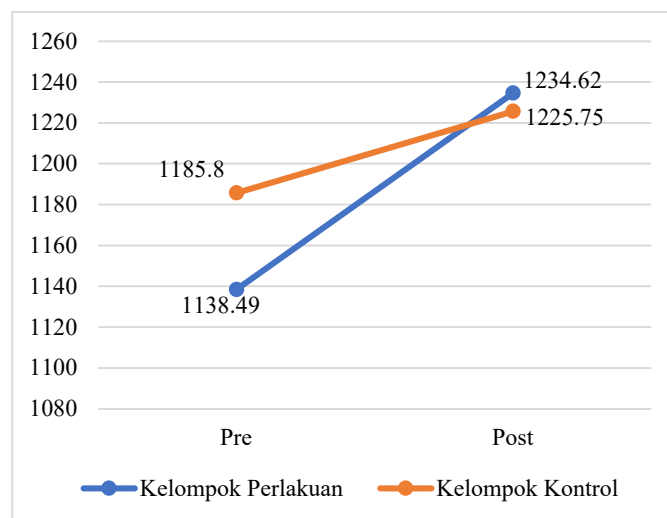


Figure 4. Work productivity

Based on the picture above, both groups had the same increase in distance on a 12-minute run. However, there was increased sharply in the average mileage in the treatment group from 1138.49 + 230.24 meters to 1234.62 + 209.71 meters. Meanwhile, in the control group, there was a g increased gradually from 1185.8 + 215.31 meters to 1225.75 + 195.18 meters. The increase in physical exercise occurs because there is a monitoring from the Wellness program regarding recommendations for routine and regular physical activity and exercise. Regular physical exercise helps improve the overall efficiency of the heart. Individuals who are physically active generally have lower blood pressure and are less likely to develop high blood pressure.

Those who are physically active tend to have better muscle and joint function, because these organs are stronger and more flexible. Physical activity can improve and maintain fitness, cardio-respiratory endurance (Agung and Ahmad Handayani, 2021). Based on the research (Hasniyati and Ismanilda, 2021) the risk of hypertension in the group who is active in physical exercise is 0.40 times lower than the group who is less physically active. Implementation wellness program can improve of physical fitness and work productivity because it uses a togetherness approach in the government employee environment, the support from supervisor and also self-motivation to support and implement the program with great enthusiasm in various activities as part of the Wellness program such as nutritional counseling including of monitoring and evaluation of physical activity and diet settings were carried out for 8 weeks in the treatment group. The existence of self-motivation in the subject makes the subject willing to move the ability in the form of expertise or skills, energy and time to carry out various activities that are his responsibility to achieve various organizational goals that have been determined (Siagian, 2012).

#### 4. Conclusion

Wellness program implementation was carried out for 8 weeks has an effect on decreasing of syndrome risk that prove by reduce weight in obesity category from 37.5% to 25% subject were suffered obesity, decreasing of systolic blood pressure tend to normal category, blood sugar level <140 mg/dl and cholesterol level maintain in normal category <200 mg/dl. Wellness programs can improve physical fitness by doing regular physical exercise with implementing FITT concept. This study showed that wellness program implementation led to increase work productivity significantly influence by decreasing of syndrome metabolic risk category and improving of physical fitness.

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