PREVENTION AND CONTROL OF NON-COMMUNICABLE DISEASES (NCDs) THROUGH INTEGRATEDDEVELOPMENT POSTS (POSBINDU) ON CAMPUS.

Krispinus Duma[1*]
[1]*Public Health-Community Medicine Science LaboratoryFaculty of Medicine,Mulawarman University, Indoenisa*
**Correspondence author : pinsei@gmail.com*
Rahmat Bahktiar[2]
[2]*Public Health-Community Medicine Science LaboratoryFaculty of Medicine,Mulawarman University, Indoenisa*
Email: bakhtiar_rahmat@yahoo.com.sg
Evi Fitriany[3]
[3]*Public Health-Community Medicine Science LaboratoryFaculty of Medicine,Mulawarman University, Indoenisa*
Email: idale_262@yahoo.com
Pius Weraman[4]
[4]*Faculty of Public Health, Nusa Cendana University, Kupang, Indonesia*
Email: piusweraman@staf.undana.ac.id,
Ida Leida Maria[5]
[5]*Faculty of Public Health, Hasanuddin University, Indoenisa*
Email: evi.fitriany@gmail.com

KEYWORDS

Community participan, Prevention-control of NCDs, Posbindu,Risk Factors-NCDs.

ABSTRACT

Non-communicable diseases have been increasingly attacking young people lately, and are slowly killing the productivity of the younger generation. The purpose of this study was to describe the risk factors for non-communicable diseases (RF-NCDs) in the campus community. This type of research was descriptive observational, the population was the campus community with respondents from each faculty. Risk factors for NCDs experienced by the campus community were identified through posbindu activities. Results: Around 4.41-20.59% of the campus community participating in the posbindu activities had NCD symptoms. Behavioral risk factors include lack of vegetable and fruit consumption, lack of physical activity and smoking. 'Intermediate' risk factors include waist circumference, BMI, uric acid, random blood sugar and cholesterol. Conclusion, symptoms of RF-NCDs in the campus community of Posbindu participants have hidden RF (heredity and behavior) and 'intermediate' RF in the form of waist circumference, BMI, cholesterol and uric acid. Commitment is needed for prevention and control of RF-NCDs as early as possible through Posbindu activities.

Background

Health is a condition desired by every person or group of people, to be productive in every job. Not infrequently, with the reason of increasing work productivity or pursuing a target, someone works by sitting for hours or even staying up late at night while eating snacks or smoking without considering rest time, nutritious food, exercise, let alone for health checkups at health services such as health centers or hospitals. All of these behaviors are risk factors for non-communicable diseases.

Non-communicable diseases (NCDs) including diabetes mellitus, stroke, cancer, and others hit slowly without being realized, but the impact after contracting NCDs is very difficult to cure, especially if it is already in an advanced stage. Many people say that their neighbors died or had strokes suddenly. In fact, the person has long experienced the risk factors for NCDs, but is not aware of it or is always ignored, because these risk factors are generally related to unhealthy habits and lifestyles[1].

Risk factors for NCDs can be distinguished according to their phases, namely the covert phase and the intermediate phase. Some covert phase FRs cannot be controlled such as age, gender, and heredity, but some can be controlled such as smoking behavior, lack of physical activity, unbalanced diet (salt, sugar, fat, etc.), stress, accidents and trauma. If these FRs can be recognized in everyday life and anticipated, then NCDs can be prevented and controlled early.

The campus worker community, which is a group of scholars, carries out routine work that has targets every day, often making them forget to eat, rest, do physical activities/exercise, and even cause stress. Such behavior and work patterns are FR-NCDs that are sometimes ignored until a health disorder arises before realizing that they have been attacked by the disease. If the attack of the disease is a common health disorder, then the treatment is still cheap and can be cured, but if the attack is already in an advanced stage, it must require expensive treatment and lifelong care. This is what is often experienced by the campus worker community, even though campus facilities are adequate to be used in the prevention and control of NCDs such as campus health clinics, sports facilities, laboratories and other facilities as well as trained and professional personnel.

Starting from several campus community colleagues who suddenly fell ill or died with a diagnosis of NCDs, it is always surprising. However, falling ill or dying did not happen suddenly, but for some time it was actually preceded by symptoms or FRs that were not realized. If the FRs are monitored regularly and periodically, then the NCDs suffered can be prevented or controlled earlier so that they do not suddenly fall ill or die.

The results of preliminary observations in the campus community showed that the risk factors (FR) of NCDs that are hidden in daily life behavior such as lack of physical activity were 50% and sometimes consuming instant food and drinks 63.4%. BMI above normal 64.8%, waist circumference more than ideal 52%, family history of one or more risk factors 85%, smoking 23.5%, unbalanced diet of carbohydrates-protein-fat-fiber and vitamins-minerals 20.1%, and unable to control stress 14.1%[2].

Regular health check-ups (medical check-ups) have never been carried out among campus worker communities, both civil servants (PNS) and honorary employees. So they do not know their health history, except when they fall ill, they check their health. For this reason, a model for prevention and control of NCDs is needed that can bring services closer to the campus worker community through an integrated development posts (abbreviated as Posbindu) on campus. With this Posbindu, services can be carried out in an integrated, routine and periodic manner according to the characteristics of the risk factors for NCDs or degenerative diseases experienced by the campus worker community so that their work is not neglected.

In addition, this Posbindu model can empower campus facilities in an integrated manner in preventing and controlling NCDs starting from sports facilities (indoor/outdoor) for physical

activities, health clinics, laboratories and human resources who are experts, educated and who are studying.

Objective.

To identify risk factors for hidden and non-hidden NCDs in the work community in the campus environment in order to prevent and control non-communicable diseases through integrated coaching post activities (Pos Pembinaan Terpadu abbreviated as Posbindu)

Method.

This type of research is descriptive observational. Measuring the FR of hidden and non-hidden NCDs. Research instruments with checklists, tensiometers, meters, weight scales and autochek, The population is the work community in the campus environment and the sample is the campus worker community who participate in posbindu activities.

Results

Table 1. Percentage of Participants and families of campus Posbindu participants who have a Medical History.

No	Family Medical History of Posbindu Participants.			Medical History of Posbindu Participants.		
	Risk Factors		%	Risk Factors		%
1	Diabetes Mellitus	Yes	25,00	Diabetes Mellitus	Yes	10,29
		Not	75,00		Not	89,71
2	Hypertension	Yes	50,00	Hypertension	Yes	13,24
		Not	50,00		Not	86,76
3	Heart disease	Yes	19,12	Heart disease	Yes	4,41
		Not	80,88		Not	95,59
4	Stroke	Yes	14,71	Stroke	Yes	0,00
		Not	85,29		Not	100,00
5	Asthma	Yes	26,47	Asthma	Yes	8,82
		Not	73,53		Not	91,18
6	Cancer	Yes	5,88	Cancer	Yes	0,00
		Not	94,12		Not	100,00
7	High cholesterol	Yes	35,29	High cholesterol	Yes	20,59
		Not	64,71		Not	79,41
		Jlh	100,00		Jlh	100,00

Tabel 2. Percentage of Campus Posbindu Participants Who Have Behavioral Risk Factors

Behavior		Posbindu Participants (%)
Smoking.	Yes	10,29
	Not	89,71
Physical activity.	Yes	44,12
	Not	55,88
Eating vegetables or fruit.	Yes	35,29
	Not	64,71
Alcohol consumption.	Yes	5,88
	Not	94,12
	Jlh	100

Tabel 3. Percentage of Campus Posbindu Participants Who Have BMI, Waist Circumference and Uric Acid Measurements

Factors	Category	Male		Female		L+P (%)
		Size	%	Size	%	
Waist circumference (cm)	High	> 90	48,48	> 80 cm	72,73	60,61
	Normal	< 90	51,52	< 80 cm	27,27	39,39
BMI Kg/m^2	Fat	> 25	45,71	> 23	75,76	60,74
	Normal	< 25	54,29	< 23	24,24	39,26
Uric acid Mg/dL	Non-standar	>7	36,36	>6	16,67	26,52
	Standar	2,5-7	63,64	1,5-6	83,33	73,48
	Total		100		100	100

Tabel 3. Percentage of Campus Posbindu Participants Who Have Blood Sugar and Cholesterol Measurements

Faktor Risiko	Kategori	Ukuran	%
Blood Sugar (mg/dL)	Not-normal	> 200	6,82
	Normal	< 20	93,18
Cholesterol (mg/dL)	Not-normal	> 190	50
	Normal	< 190	50
	Total		100

Tabel 4. Percentage of Campus Posbindu Participants Who Have Blood Sugar and Cholesterol Measurements

Category Blood Pressure	Systolic Pressure		Diastolic Pressure		Average
	Measurement	Participant	Measuremen	Participant	

	(mmHg)	s (%)	t (mmHg)	s (%)	
Normal	< 120	34,33	< 80	59,70	47,01
Prehipertension	121-139	41,79	80-89	22,39	32,09
Hipertension (1-3)	>140	23,88	>90	17,91	20,90
Total		100		100	100

Discussion

Some people underestimate NCDs by joking why are non-communicable diseases a concern when they are not contagious, infectious diseases should be eradicated. Such people do not understand that people in developing countries and in health development experience a double burden of disease. They have not completely eradicated infectious diseases caused by bacteria, viruses, plasmodium and others through intermediary media or vectors. Now faced with non-communicable diseases caused by interactions between physiological, genetic, behavioral and non-human factors such as social, economic and environmental conditions around them.

Posbindu is a means of integrated community participation coaching activities in preventing NCD risk factors and early detection of NCD symptoms. The community with their own awareness can prevent and control NCD risk factors as early as possible in themselves before they become sick. Meanwhile, early medical detection, treatment and rehabilitation are carried out by health services both at the primary and referral levels.

Age, gender and heredity are non-modifiable NCD risk factors, therefore they can only be overcome by complying with healthy living behaviors. The average age of campus posbindu participants is 42.5 years (26-58 years), 50.72% are male and 49.28% are female. And the medical history of family members of campus posbindu participants as hereditary risk factors include diabetes mellitus, hypertension, heart disease, stroke, asthma, cancer and high cholesterol. Meanwhile, the medical history of campus posbindu participants is 20.59% with high cholesterol but none with cancer or stroke (table 1). The most common medical history of family members of campus posbindu participants is hypertension at 50%, followed by asthma at 26.47% and diabetes mellitus at 25.00%. In the medical history of campus posbindu participants, the most common are high cholesterol sufferers at 20.59%, then hypertension at 13.24%, diabetes mellitus at 10.29% and asthma at 8.82%. With this data, it shows that 20.59% of campus posbindu participants have a history of hereditary diseases at the age of around 42.5 years.

The lifestyle of campus posbindu participants which is a risk factor for NCDs hidden in daily habits is presented in table 2. Posbindu participants who eat less vegetables and fruits are 64.71%, followed by less physical activity (lack of exercise) of 55.88% and smoking of 10.29%. Behavioral risk factors are modifiable factors in the prevention and control of NCDs in the campus worker community[3].

Not eating enough vegetables and fruits is a habit that has been carried over from childhood because parents are not accustomed to eating vegetables or fruits. It is better for children to be introduced to the function and benefits of eating vegetables and fruits from an early age, through various methods such as through stories, illustrations or pictures[4].

Some people also do not understand the benefits of vegetables and fruits for health. Vegetables and fruits are sources of minerals, vitamins and fiber. By Ichsan, B; Wibowo,

B.H; Sidiq, M.N. 2015 found an increase in children's knowledge after receiving counseling on the importance of eating vegetables and fruits[5].

The campus worker community who lack physical activity or exercise has several reasons, including being too busy and not having time to exercise. As many as 55.88% of them lack physical activity. According to Franz, D. D.; Feresu, S. A. (2013) physical activity for health does not take long to interfere with work. For example, a lecturer on campus from the rector's office to a faculty to teach by walking back and forth for 10-15 minutes, so he does not waste his time but has done healthy physical activity. However, because walking facilities are inadequate, lecturers take vehicles even for short distances[6].

The function of doing physical activity or exercising regularly is to increase the body's resistance to attacks by disease germs. When viewed from the Principles of Sports Physiology, the intensity of health exercise must be submaximal and should be homogeneous, according to the dose of exercise for health. The dose of exercise is determined by two factors, namely Intensity and Duration. The intensity and duration of Health Exercise must be adequate, namely in accordance with the desired level of health exercise targets. If Health Exercise is intended for maintaining and/or improving Dynamic Health Levels (Exercise for Physical Fitness), then the duration of core exercise should not be less than 10 minutes non-stop. However, if it is intended for losing weight, then the duration should not be less than 30 minutes[7].

The Indonesian Ministry of Health has created a national strategy for implementing food consumption patterns and physical activity to prevent non-communicable diseases including[8]:

1. Strengthening laws and regulations that support the implementation of diverse, balanced and safe food consumption patterns and sufficient and regular physical activity;
2. Partnership and multi-sector approaches including strengthening the National Network mechanism for Controlling Non-Communicable Diseases;
3. Increasing and developing resources for implementing activities/actions;
4. Focusing on equal rights and eliminating disparities between community groups;
5. Increasing effective evidence-based interventions in various settings (households, schools, public places, workplaces and health care facilities);
6. Implementing operational research and developing long-term policies and strategies for the sustainability of community-based NCD prevention.

Smoking is a factor that has been widely debated by people so far, business people claim that cigarettes contribute foreign exchange for development and absorb labor. While nicotine lovers claim that cigarettes cause relaxation and calm thinking so that they can create work enthusiasm and productivity. However, health officials claim that smoking is a factor that causes lung cancer and other diseases.

Physiological risk factors, which occur before non-communicable diseases (NCDs) appear, are 'intermediate' risk factors in NCDs such as hypertension, hyperglycemia, obesity and dyslipidemia. These physiological risk factors can be measured from body mass index (BMI), waist circumference, cholesterol, uric acid and blood pressure as presented in tables 3 and 4. Male posbindu participants have a BMI >= 25 kg/m2 (weight/height) of 45.71%, and women who have a BMI >= 23 kg/m2 are 75.76%.

Male posbindu participants who have a waist circumference (LP) of more than 90 cm are 48.48%, and women who have a waist circumference of more than 80 cm are 72.73% are a measure of obesity (central/abdominal obesity).

Central obesity based on waist circumference plays a greater role as a risk factor for diabetes mellitus (DM) compared to general obesity based on BMI9. Septyaningrum, N., Martini, S (2014) found that waist circumference has a significant relationship with blood sugar levels ($p = 0.001$; $r = 0.424$). So with the results of waist circumference measurements can describe the condition of blood sugar and DM of a person. Measuring waist circumference is simpler than measuring/calculating BMI so it is easier to assess the Risk Factors experienced by a person, but waist circumference does not consider height.

36.64% of male posbindu participants had uric acid above normal (normal size for men 1.5-7 mg/dL), while 16.67% of female participants had uric acid above normal (normal size for women 1.5-6 mg/dL).

The results of instantaneous blood sugar measurements of normal posbindu participants (less than 200 mg/dL) were 93.18%, and the remaining 6.82% were abnormal (more than 200 mg/dL). Instant blood sugar levels show blood sugar levels at that time, if at that time you have eaten and those who have not eaten, it will show different blood sugar levels. Measuring blood sugar with HbA1c will describe the average blood sugar levels within 2-3 hours after the last meal. Blood sugar examination with HbA1c is better and more accurate in describing blood sugar levels, so it is suitable for people with DM, but it is more expensive and requires equipment and a laboratory.

As many as 50% of posbindu participants have total cholesterol above normal (more than 190 mg/dL), but here LDL cholesterol (Low Density Lipoprotein, normally <115 mg/dL) or HDL cholesterol (High Density Lipoprotein, normally, 40 mg/dL) is not measured. There are 6.82% of posbindu participants who have random blood sugar above normal (more than 200 mg/dL).

Blood pressure measurements in posbindu participants are presented in table 5, it can be seen that the hypertension category (1-4) systolic > 140 mmHg is 23.88% and diastolic > 90 mmHg is 17.91%. The prehypertension category systolic 121-139 mmHg is 41.79% and diastolic 80-89 mmHg is 22.39%. Infodatin (2014) reported that East Kalimantan Province ranks third for hypertension (29.6% of the population is hypertensive) in Indonesia after Bangka Belitung (30.9%) and South Kalimantan (30.8%). Based on NIH Publication 2003, in cases of high blood pressure (hypertension) lifestyle modification is required in the form of reducing body weight, consuming foods rich in fiber such as vegetables and fruits and low-saturated fat dairy products, reducing daily sodium intake (sufficient 2.4 g sodium or 6 g sodium chloride per day), exercising for at least 30 minutes every day of the week and avoiding or reducing alcohol consumption[10].

Conclusion.

About 5.88-50% of campus posbindu participants have a history of one or more family diseases such as hypertension, high cholesterol, asthma, diabetes mellitus, heart disease, stroke or cancer. The highest percentage is a history of family members with hypertension, cholesterol and diabetes mellitus. As many as 5.88-64.71% of posbindu participants have NCD Risk Factors related to behavior or daily habits in the form of not eating enough

vegetables and/or fruit, not being physically active and smoking. The largest number of posbindu participants are those who don't eat enough vegetables and/or fruit (64.71%). Around 55.88% are physically inactive, and 10.29% smoke. Physiological risk factors, which are diseases between NCDs, are hypertension (tensiometer), hyperglycemia (cholesterol) dyslipidemia (uric acid) obesity (BMI).

Acknowledgements

Thanks are extended to the Directorate of Research and Community Service (DRPM) of the Ministry of Research, Technology and Higher Education in 2017 for funding so that this research can run well. Thank you to the Rector and all academicians of Mulawarman University for their cooperation in initiating the establishment of the Posbindu for non-communicable diseases on campus.

Bibliography

1. WHO, 2014. Global Status Report On Noncommunicable Diseases 2014
2. Duma, K; Bahktiar, R, Fitriany, E. 2017. Identification of Risk Factors for Non-Communicable Diseases (NCDs) for the Establishment of Integrated Development Posts (Posbindu) for Campus NCDs, Presented at the VII Indonesian National Health Policy Forum Seminar, 25-26 October 2017.
3. Trihandini, I. 2015. The Relationship between Smoking as a Modifiable Risk Factor for Various Chronic Complications in the Elderly with Type 2 Diabetes Mellitus, MakaraJ. Health Res.,2015, 19(1): 8-14.
4. Sugihartono, R.P.2015. Designing an Illustrated Book on the Benefits of Fruits and Vegetables for Children, Issn: 2355-9349, E-Proceeding Of Art & Design: Vol.2, No.3 December 2015 | Page 109.
5. Ichsan, B; Wibowo, B.H; Sidiq, M.N. 2015. Counseling on the Importance of Vegetables for Children at Aisyiyah Kwadungan Kindergarten, Trowangsan, Malangjiwan, Colomadu, Karanganyar, Central Java, Warta, Vol. 18, No. 1, March 2015: 29 - 35 Issn 1410-9344.
6. Franz, D. D.; Feresu, S. A. (2013). The relationship between physical activity, body mass index, and academic performance and college-age students* *Open Journal of Epidemiology*, 2013, 3, 4-11
7. Giriwijoyo, S. 2007. Sports Physiology, Faculty of Sports and Health Education, Indonesian University of Education, 7th Edition.
8. Ministry of Health of the Republic of Indonesia. 2011. National strategy for implementing food consumption patterns and physical activity to prevent non-communicable diseases, Jakarta, Directorate General of Nutrition and Maternal and Child Health, Ministry of Health of the Republic of Indonesia. 2011.
9. Soetiarto, F; Suhardi, R. 2010. The Relationship Between Diabetes Mellitus and Obesity Based on Body Mass Index and Waist Circumference Data from Riskesdas 2007, Health Research Bulletin, Vol. 38, No. 1,2010: 36 Center for Biomedical & Pharmaceutical Research and Development, Jakarta.
10. NIH Publication no. 03-5233, 2003. Prevention, Detection, Evaluation, and Treatment of High Blood Pressure The Seventh Report of the Joint National Committee on JNC 7 Express.