



## Non-Communicable Disease Screening Services for Teachers and Employees in the Senior High School (SMA) 3 Jayapura, Papua Province

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### ABSTRACT

Non-communicable diseases (NCDs) are diseases that are caused by various factors and are not transmitted from individual to individual. Deaths caused by non-communicable diseases 35% are due to heart and blood vessel diseases, 12% by cancer, 6% by chronic respiratory diseases, 6% due to diabetes, and 15% due to other NCDs. Early detection through glucose, cholesterol & uric acid checks can prevent heart disease & diabetes. The target population in this community service is teachers and high school employees aged 25 - 60 years. The results of the examination showed that female teachers were more than male teachers. The age < 40 is more than teachers and employees aged >40 years. Patients with Hypercholesterolemia totaled 25 people (59%), indicating that high cholesterol was experienced by many teachers and employees at SMA N 3 Jayapura. Hypercholesterolemia can trigger the formation of atherosclerosis which causes blockages in the endothelium of blood vessels.

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## INTRODUCTION

Non-Communicable Diseases (NCDs) are diseases that are not detected because they are asymptomatic and there are no complaints. It is usually found in an advanced stage so that it is difficult to cure and ends in disability or premature death (Fuadah & Rahayu, 2018). Another definition states that non-communicable diseases are diseases that are not caused by bacterial infections. These diseases include stroke, coronary heart disease, cancer, diabetes mellitus, chronic obstructive pulmonary disease (COPD) and disorders due to accidents and acts of violence (Yarmaliza & Zakiyuddin, 2019). Based on data from WHO, NCDs are one of the most common causes of death. In 2017 there was 69.90% of the total disease burden in Indonesia (Sukmana, 2020). Cases of non-communicable diseases have been proven to change along with people's lifestyles.

The number of non-communicable diseases varies from time to time, according to reports from NCDs as many as 60% of non-communicable diseases are the cause of death of all ages, 4% and 29% die before the age of 70% in developing and developed countries. Based on Riskesdas in 2013, Indonesia is at 71% for non-communicable diseases such as stroke as much as 12.1 per 1000, injury 8.2%, diabetes mellitus 6.9%, obstructive pulmonary disease 3.7%, coronary heart 1.5%, cancer 1.4% per 1000, heart failure 0.3%, and kidney failure 0.2% causing an increase in deaths due to NCDs (Supriyatna, Pertiwiwati, & Setiawan, 2019).

Death data according to the World Health Organization (WHO) shows that of the 57 million deaths in the world in 2014, as many as 36 million were caused by NCDs. Cardiovascular disease is the largest cause of death at 39%. As many as 70% of the global population will die from NCDs such as heart, stroke, diabetes mellitus, cancer. The prevalence of NCDs in Indonesia according to the 2012 Household Health Survey (SKRT) in the age group of 25-34 years is 9.3% and increases with age in the age group of 53-64 years by 15.5% (Yarmaliza & Zakiyuddin, 2019). The data indicates that there are various negative effects of cases of non-communicable disease in the community.

The metabolic keys in the control of NCDs are the control of blood pressure, blood glucose levels and cholesterol. All three, including uric acid levels, play a role in the occurrence of cardiovascular diseases such as coronary heart disease and ischemic stroke which are the causes of death worldwide. NCD control begins with early detection of blood sugar, cholesterol and uric acid levels (Lima, Hataul, & Taihuttu, 2020). Previous data stated that there were 4.4 million deaths due to hypercholesterolemia or 7.9% of the total number of deaths at a young age. Hypercholesterol is a condition in which cholesterol levels in the body exceed normal conditions (Susanto et al., 2022).

One way to control non-communicable diseases is to reduce and control risk factors through early detection (screening) (*World Health Organization*, 2021). Early detection or screening aims to monitor disease risk factors so that they can be known as early as possible and can be followed up.

The community of teachers and school employees is a group of people who are vulnerable to experiencing non-communicable diseases. Differences in

lifestyle, background, level of health literacy and life experience will affect the quality of life. They have the potential to suffer from non-communicable diseases so they need screening or blood chemistry tests. Therefore, the purpose of our community service is to improve health and prevent non-communicable diseases in teachers and school employees.

## **IMPLEMENTATION AND METHODS**

The Non-Communicable Disease disease screening activity will be carried out at SMA Negeri 3 Jayapura, Papua Province, in 8th August 2024.

### ***Process of implementing and materials:***

1. Making a permit for service activities addressed to partners, namely SMA Negeri 3 Jayapura
2. Coordinating with the school and the health workers who will be involved
3. Non-Communicable Disease screening activities will involve doctors, public health workers and medical students during the screening process
4. Collecting identity data along with anamnesis to all teachers who attended the screening activity
5. Conducting blood pressure checks, cholesterol levels, blood sugar (GDS), and uric acid levels
6. Providing consultation on the results of the examination along with education on the prevention of non-communicable diseases.
7. The activity was closed by providing education and drug prescriptions to at-risk groups.

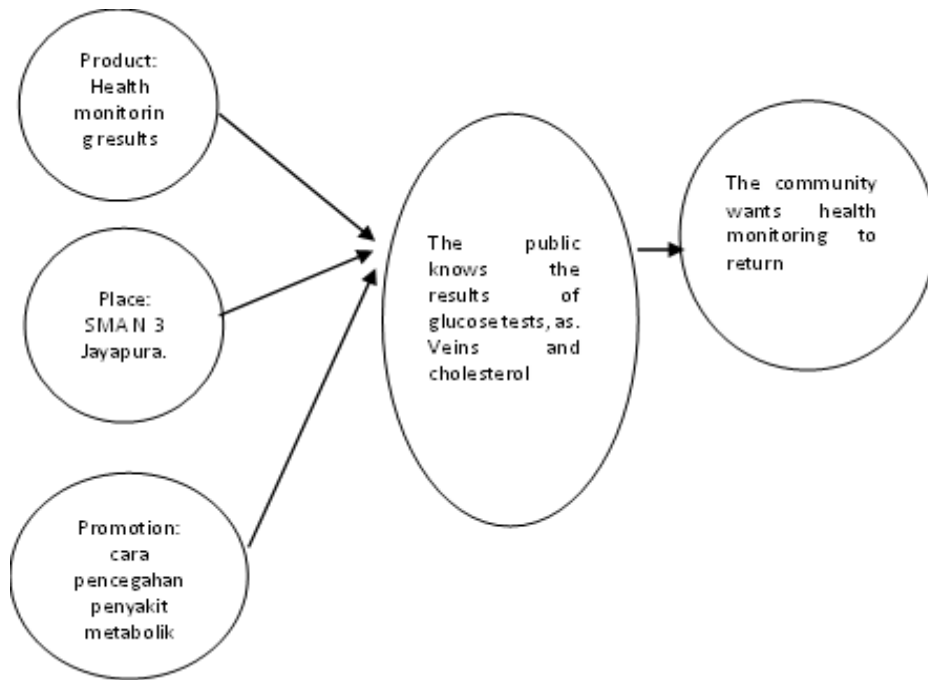
Materials and tools needed include; Sphygmomanometers, thermometers, glucose, uric acid and cholesterol checkers, scales, sanitizers and personal protective equipment for health workers.

### ***Background of Participants***

Participants are teachers and employee those aged 25 – 60 years, both symptomatic and asymptomatic, such as headaches, muscle and joint pain, and other complaints.

The expected outcome of this community service activity is to increase public awareness to better maintain health and maintain a balanced nutritional intake so that public health, especially the teacher community, is better and avoids non-communicable diseases.

Evaluation of program implementation and program sustainability is carried out by holding meetings with schools and local health centers, as well as proposing to create cooperation with schools, as community service partners.



**Figure 1. Conceptual Framework**



**Figure 2. Blood tests by medical team**



**Figure 3. Consultation of health examination results by doctors**



**Figure 4. Cholesterol and blood pressure checks**



**Figure 5. Cholesterol and blood pressure checks**

## **RESULTS AND DISCUSSION**

Cholesterol is a fat found in the bloodstream or in the body's cells, which is actually needed for the formation of cell walls and as a raw material for several hormones, but if the cholesterol level in the blood is excessive, it will result in coronary heart disease and stroke. Most of the 80% of cholesterol in the body is produced naturally in the liver. Meanwhile, a small portion of about 20% of cholesterol comes from foods consumed such as products of animal origin, such as meat, eggs, and milk. Total cholesterol includes LDL, HDL, and triglyceride cholesterol (Susanti, 2022). The total cholesterol value level is divided into three, namely normal 200-239 mg/dl, and high >240 mg/dl (Bangkele, Demak, & Mutiarasari, 2021). If cholesterol levels are high, it can increase the risk of CHD, stroke, and poor blood circulation (Lima et al., 2020).

Gout is the result of normal metabolism from protein digestion (especially from meat, liver, kidneys or from the breakdown of purine compounds that should be excreted through the kidneys, feces or sweat (Susanti, 2022). The accumulation of uric acid in the body causes excess uric acid levels in the blood. Signs and symptoms of gout are an increase in serum uric acid, severe pain that comes suddenly, stiff movements, easy fatigue and lethargy, skin rash, sore throat, decreased appetite, red tongue (bleeding gums) (Lima et al., 2020).

Uric acid levels in the blood are slightly affected by dietary purine content variants and describe the stability between endogenous production and secretion of tubules into the urine. Purines are derived from food metabolism and endogenous nucleic acids, and are degraded to uric acid via the enzyme xanthine oxidase. Before becoming uric acid, purines are converted to adenosine. Then adenosine will be converted to adenine and inosine which by enzyme adenine deaminase and phosphorylase are both converted to hypoxanthine. By xanthine oxidase hypoxanthine is converted to xanthine and finally xanthine is converted to uric acid. Adenosine, apart from purine metabolism, can also come from tissues that undergo hypoxia (Susanti, 2022).

The impact of non-communicable diseases can be deadly. Previous data explained that 35% of deaths caused by non-communicable diseases were due to heart and vascular diseases, 12% by cancer, 6% by chronic respiratory diseases, 6% due to diabetes, and 15% caused by other NCDs. In total, by 2030 it is predicted that there will be 52 million deaths per year due to non-communicable diseases (Arifin, Setyawan, & Warella, 2021). The real consequences of non-communicable diseases in the community have an impact on decreasing the degree of health and work productivity (Rusdiyanti, 2018). The cost burden of patients and the government in dealing with the disease is a further problem as it affects a person's quality of life (Handoyo, Setiawan, & Fitriyani, 2021). The most common manifestations of non-communicable diseases can be known by looking at several levels of abnormalities in blood chemistry such as uric acid, cholesterol and blood sugar at any time.

This service was carried out at Senior High School 3 Jayapura, Jl. Merah putih Buper, Waena, Heram District, Jayapura, Papua. The implementation time is on July 17, 2024, at 09.00 - 11.00 WIT. Community Service with the title Non-Communicable Disease Screening Services for teachers and employees in the N

3 Jayapura Secondary School Environment was carried out by 1 Neurology specialist, 3 general practitioners and 6 medical students of the Medical Assistance Team, with the number of participants who were examined for non-communicable diseases was 42 teachers and employees.

The activity began with the provision of counseling related to non-communicable diseases, then teachers and employees registered and took queue numbers. After getting the queue number, respondents will be examined starting from blood pressure checks, Current Blood Sugar (GDS) checks, uric acid checks, and cholesterol checks. After getting the results of the examination, teachers and employees consult the results of the examination and prescribe medication by the doctor.

Based on the results of the examination, the following data was obtained: The age of >40 years old totaled 17 people. Teachers/employees who have High Blood Pressure amounted to 12 people (28%). Teachers with Hypercholesterolemia (Cholesterol >200 mg/dl) amounted to 25 people (59%), GDS > 200 amounted to 17 people (40.4%), and those who experienced Hyperuricemia (As.Urat >6.0) amounted to 15 people (36%).

The complaints experienced are diverse, ranging from neck tension, cramps, muscle and joint pain, bone pain, as well as complaints of polycystic polydipsy and polyphagy for patients with GDS > 2000mg/dL. From the complaints and the results of the examinations that have been carried out, the doctor gives medicine according to the complaints and blood test results. The drug is administered atorvastatin for hypercholesterolemia patients, Allopurinol 100 mg for Hyperuricemia patients, and Metformin for hyperglycemia. In addition to administering medicines, doctors also provide education on how to prevent, regulate diet, lifestyle by exercising, avoid alcohol and fatty and high-sugar foods. For patients who still experience complaints, it is recommended to conduct a more complete examination to hospitals and clinics with better facilitation.

## CONCLUSIONS AND RECOMMENDATIONS

The results of the examination showed that female teachers were more than male teachers. The age < 40 is more than teachers and employees aged >40 years. Patients with Hypercholesterolemia totaled 25 people (59%), indicating that high cholesterol was experienced by many teachers and employees at SMA N 3 Jayapura. Hypercholesterolemia can trigger the formation of atherosclerosis which causes blockages in the endothelium of blood vessels. It is important to carry out check-ups, education on dietary changes, exercise and adequate rest for patients with Dyslipidemia (Hypercholesterolemia).

Suggestions for Partner institutions to improve the services of the School Health Unit (UKS) and expand cooperation with Puskesmas and the Faculty of Medicine or other Health Institutions so that they can conduct periodic health checks for all teachers and employees. In addition, it is necessary to carry out education and counseling to the public about the dangers of non-communicable diseases such as Diabetes Mellitus, Stroke, Heart, Osteoarthritis and other diseases triggered by high cholesterol, glucose, and *uric acid*.

Then, For other researchers, it is hoped that they will develop early detection examinations that are not limited to metabolic diseases, but more broadly in the detection of cervical cancer with IVA Test. Other researchers are also expected to increase community service activities for a wider range of community targets.

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