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**Original Research Article**

# Non-Communicable Diseases of the Elderly during the Pandemic COVID-19 in Rural and Urban Areas, Kupang-East Indonesia

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**Abstract:** Patients confirmed positive COVID-19 with co-morbid Non-Communicable Diseases (NCD) have a high risk of complications and even death specially in elderly. During the COVID-19 pandemic, elderly with NCD were skip their schedule to control the diseases. This study aimed to determine the prevalence of elderly suffering from NCD in urban and rural areas and analysed the different risk factor of NCDs in urban and rural area. ***Method*:** This cross-sectional study with a purposive sampling method, were involved members of the elderly integrated health service center for elderly (IHSCoE) in the working area of five community health centers (three health centers in urban areas and two health centers in rural) in Kupang, East Nusa Tenggara. Data were collected for 20 days, in October 2020, after obtaining research ethics approval from the Health Research Ethics Commission of the Medical Faculty of Universitas Nusa Cendana. Data were collected using a digital questionnaire and measurements. The inclusion criteria of the respondents in this study were elderly ≥ 60 years old, were independent elderly, willing to be involved in this study expressed oral consent after being informed. Measurement data were height, weight, total cholesterol, non-fasting blood sugar. Anthropometric measurements made twice then averaged according to the provisions of the WHO. The data collection strict to the health protocol to prevent COVID-19. This study uses analytical statistic to compare the mean of health data of elderly in urban and rural area ($p < 0,05$). ***Research Results:*** The respondents obtained were 121 elderly respondents aged ≥ 60 years (72.7% lived in urban areas, 27.3% in rural areas). Overall, the average age of research respondents was 67 years. Based on the body mass index, the percentage of respondents with overweight and obesity respectively in urban was 20.5%, 25% and rural elderly was 26%, 34%. The percentage of respondents with hypertension was higher than in rural areas but there were no significant different of blood pressure mean between them. The percentage of hypertension patients with grades 2 and 3 in urban areas was 28.4%, in rural areas it was 18.2%. The percentage of hypertension sufferers' grade 2 and 3 in urban areas was 13.6%, in rural areas it was 21.3%. As many as 79.3% of respondents suffered from hypercholesterolemia (no significant different cholesterol level between this group), where in urban areas the percentage of patients was 79.5 and rural 78.8. The results of this study indicate that the percentage of elderly respondents with diabetes mellitus in rural areas is higher (18.2%) than in urban areas (6.8%), and has a significant different of mean between these two groups ($p < 0,00$). ***Conclusion:*** Elderly in rural area has a higher risk of non-communicable diseases.

**Keywords:** Non-communicable diseases, elderly, COVID-19.



## INTRODUCTION

Data on the official website of the Task Force for the Acceleration of Handling COVID-19 in Indonesia, shows that, as of July 24, 2020, there were 95.418 cases of positive COVID-19, Confirmation cases with hypertension were 17.1%, 11.7% had co-morbid diabetes mellitus and 6.8 % had heart disease. Several studies have shown that most patients who are positive for COVID-19 do not show clinical symptoms, on the contrary, severe clinical symptoms are experienced by the elderly or who have a history of co-morbid diseases, such as hypertension, diabetes mellitus, and others. Even data on the official website of the Task Force for the Acceleration of Handling COVID-19 shows that the highest proportion of mortality rates is in the ≥ 60-year-old group of 42.9% in those who are elderly.

Control of non-communicable diseases (NCD) is an important factor in efforts to prevent and control the COVID-19 pandemic especially for the elderly (Taskin *et al*., 2014), because patients are confirmed

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positive for co-morbid conditions, the risk of complications and even death is high [2]. During the pandemic period, elderly people with NCD should carry out routine controls, but this is hampered by worries about going to health facilities or hospitals, another reason is that the service time at the community health center is shortened. This makes co-morbid elderly people less likely to schedule health controls or time to take medications for degenerative diseases. In addition, integrated health service center for elderly (IHSCoE) have also been temporarily suspended during the COVID-19 pandemic. As a result, NCD in elderly is difficult to control. The purpose of this study was to determine the prevalence of elderly suffering from NCD in urban and rural areas and analyzed the different risk factor of NCDs in urban and rural area.

This research on non-communicable diseases (NCD) in elderly aged over 60 years was conducted in Kupang City and District, in the working area of five Public Health Center (PHC). There are three (3) health centers in Kupang City, namely Sikumana PHC, Bakunase and Oesapa which represent the condition of NCD for elderly in Kupang City. Two health centers in Kupang District, namely the Batakte PHC and the Oekabiti PHC.

## METHOD

This cross-sectional study was used to answer the research objectives, and samples were collected using a purposive sampling method. Respondents involved were members of the IHSCoE for elderly at five PHC. There are three (3) health centers in Kupang City, namely PHC of Sikumana, Bakunase and Oesapa which represent the condition of NCD for elderly in Kupang City. Two PHC in Kupang Regency, namely the Batakte PHC and the Oekabiti PHC, represent the condition of NCD for elderly in Kupang Regency.

The period of data collection was carried out for 20 days, starting in October 2020. Data collection was carried out after obtaining approval of Health research ethics from the Health Research Ethics Commission, and permission from the NTT Provincial Government and the district and the City of Kupang. The total number of respondents obtained was 121 elderly respondents over 59 years of age. Respondents were participants in the IHSCoE activities. The IHSCoE for elderly at the beginning of the COVID-19 pandemic did not work, but starting in September or October 2020, the IHSCoE is already running again.

The data collected using a questionnaire were respondent identity data, application of the respondent's health protocol for the prevention of COVID-19, a healthy lifestyle (exercise habits, nutritious eating and sunbathing habits), independence of respondents. Data collected through measurement are data on height, weight, total cholesterol check, and blood sugar at any time. The digital weighing instrument used is SECA, while the height uses microtoise. Total cholesterol, blood sugar and uric acid levels were checked using a rapid test on the peripheral blood of elderly respondents.

Measurements were made twice then averaged according to the provisions of the World Health Organization. The digital weighing instrument used is SECA digital scale, while the height uses microtoise. Total cholesterol, blood sugar and uric acid levels were checked using a rapid test on the non-fasting peripheral blood of respondents. The inclusion criteria for the respondents in this study were elderly ≥ 60 years old, were independent elderly, willing to be involved in this study expressed oral consent after being informed. Body mass index is categorized according to the Asia Pacific BMI criteria. Systolic blood pressure and diastolic blood pressure are categorized based on JNC VII, 2003 and the Association of Indonesian Cardiologists and Vascular Experts (PERKI), 2015. Categories of total cholesterol and non-fasting blood sugar levels used the American Diabetes Association criteria. Screening for type 2 diabetes Diabetes Care 2007. Characteristics of respondents, the prevalence of elderly suffering from NCD, and the application of the health protocol in urban and rural areas during the COVID-19 pandemic were calculated using descriptive statistics.

Data were collected using a digital questionnaire (google form), in order to reduce repetitive touches on objects such as pens and paper questionnaires. At the time of data collection, enumerators and respondents were required to wear face masks, face shields, and provide antiseptics, and sit at a distance. Before and after the interview, enumerators and respondents should wash their hands with an antiseptic. The data that has been collected will be tested for univariate analysis and will be used to analyze the description of the characteristics of the subject and the distribution test, while the bivariate test is used to achieve the research objectives by analyzing the factors that affect elderly health services at the PHC.

The data were then analyzed using SPSS 20 software, the frequency distribution statistical test was used to determine the prevalence, while the measurement data was tested with the t-test to determine the mean difference in the measurement results for elderly in urban and rural areas (first doing the data normality test). Two categorical groups different tests were used to analyze the implementation of the COVID-19 prevention health protocol, mainly urban and rural.

## RESEARCH RESULT

The total number of respondents obtained was 121 elderly respondents aged 60 years or more (72.7% lived in urban areas, 27.3% in rural areas). Overall, the average age of research respondents was 67 years (in

urban areas 68 years and in rural areas 65 years) and the largest age group was 60-70 years and female respondents were the largest percentage. Most of the elderly respondents still work, either in urban or rural areas. As many as 66.2% of subjects in rural areas still have a life partner, in rural it is 33.8%.

Based on the body mass index, respondents in rural areas have a higher risk of NCD because the percentage of respondents is overweight, obese 1, obesity 2 respectively in urban is 20.5%, 8% and 17% and rural is 26%, 13%, 21%. Respondents with normal systole blood pressure in urban-rural areas were 38.6% and 51.5%, respectively, or in urban areas, the percentage of respondents with hypertension was higher than in rural areas. The percentage of hypertension patients with grade 2 and 3 in urban areas was 28.4%, in rural areas it was 18.2%. Respondents with normal diastole blood pressure in urban-rural areas were 71.6% and 60.6%, respectively, or in urban areas, the percentage of respondents with hypertension was higher than in rural areas. The percentage of hypertension sufferers' grade 2 and 3 in urban areas was 13.6%, in rural areas it was 21.3%. As many as 79.3% of respondents suffered from hypercholesterolemia, where in urban areas the percentage of patients was 79.5 and rural 78.8. The results of this study indicate that the percentage of elderly respondents with diabetes mellitus in rural areas is higher (18.2%) than in urban areas (6.8%).

All elderly respondents in urban or rural use masks when going out of the house or meeting other people, even though there are still respondents who use masks not according to protocol (masks hang on the chin or just cover their mouths). As many as 95.9% of respondents often wash their hands, especially respondents in rural areas, 96.7% of respondents eat vegetables every day, 59.5% of respondents exercise almost every day, and 81% of respondents sunbathe in the morning every day.

The period of data collection was carried out for 20 days, starting from 2 - 22 October 2020. The data collection was carried out after obtaining the approval of Health research ethics from the Health Research Ethics Commission, and permission from the NTT Provincial Government and the district and the City of Kupang. The total number of respondents obtained was 121 elderly respondents over 60 years of age. Respondents were obtained by selecting age for those who visited the outpatient clinic at the health center, but almost all respondents were recruited from the IHSCoE activity participants. At the beginning of the COVID-19 pandemic, IHSCoE services closed, started in April 2020 than in September 2020, the IHSCoE is already running again. The initiation of IHSCoE activities for elderly at various PHC studied varies, depending on the readiness of the program manager and the willingness of IHSCoE participants.

The activities carried out by each IHSCoE for elderly in five health centers also varied, generally measuring blood pressure, body weight, height and checking levels of total cholesterol, blood sugar and uric acid. IHSCoE for elderly at Batakte Health Center even does elderly exercises towards the end of the activity.

Respondents for elderly were IHSCoE participants for elderly, where this IHSCoE was held once a month. When the COVID-19 pandemic began to spread in Indonesia, IHSCoE activities were elderly stopped (generally in April 2020) and only started again in August 2020.

The IHSCoE activities for elderly consist of 5 tables, namely the first table: registration, second: measurement table (weight, height, BMI, waist circumference, blood pressure, total cholesterol check, blood sugar during / fasting and uric acid levels). Third table: doctor consultation; by bringing the measurement results to Table 2. Then the elderly participants move to the fourth table, namely the treatment table, if the results of the examination indicate a health problem, the doctor prescribes a drug according to the diagnosis. The fifth table is an education table, where participants are given education related to their health problems.

In IHSCoE activities for elderly, non-communicable disease problems suffered by patients are detected immediately, without waiting for complaints from the elderly. So that immediately get treatment. In addition, this activity is an activity that brings health services closer to the community. This means that elderly whose homes are far from the Public Health Center (PHC) will be easier to reach IHSCoE for elderly, because of the location around the house. However, with the temporary suspension of IHSCoE services for elderly, early detection of non-communicable disease recurrences cannot run well, and more efforts are needed to reach health services at PHC. As a result, degenerative diseases (non-communicable diseases) suffered by patients are difficult to control.

The IHSCoE for elderly, which is organized by the community with the assistance of health center officers who are attended by researchers to collect research data, is an initial IHSCoE activity after being stopped for several months. So, it can be said that the respondent's medical condition is a condition that occurs as a result of elderly services for early detection of non-communicable diseases for elderly who have stopped for several months.

When IHSCoE services for elderly stop, if the routine NCD drugs that must be consumed by the elderly run out of supplies such as hypertension drugs or diabetes mellitus drugs, their consumption must be postponed. If it is very urgent, elderly people should come to the health center to control NCDs and take

medication. When traveling from home to the health center, the risk of exposure to the COVID-19 virus may increase.

The location of data collection was carried out in IHSCoE who are in the working area of five Public Health Centers (PHC), consisting of 3 health centers in Kupang City and 2 health centers in Kupang Regency. Respondents who are members of the IHSCoE in the working area of the PHC in Kupang City are respondents who live in urban areas. Elderly respondents who are members of the posyandu in the working area of the health center in Kupang Regency are respondents who live in rural areas.

**Table 1: Characteristics of research respondents based on urban and rural residence locations**

| No. | Variabel | Urban | | Rural | | Total | |
|---|---|---|---|---|---|---|---|
| | | n | % | n | % | n | % |
| 1. | Age Group | | | | | | |
| | 60-70 years | 65 | 70,7 | 27 | 29,3 | 92 | 100 |
| | 71-80 years | 19 | 76 | 6 | 24 | 25 | 100 |
| | 81-90 years | 4 | 100 | 0 | 0 | 4 | 100 |
| | Average Age (year) | 68 (60-86) | | 65 (60-80) | | 67 (60-86) | |
| 2. | Gender | | | | | | |
| | Female | 57 | 71,3 | 23 | 28,7 | 80 | 100 |
| | Male | 31 | 75,6 | 10 | 24,4 | 41 | 100 |
| 3. | Marital status | | | | | | |
| | Widows / widowers | 36 | 78,3 | 10 | 21,7 | 46 | 100 |
| | Married | 45 | 66,2 | 23 | 33,8 | 68 | 100 |
| | Not married | 7 | 100 | 0 | 0 | 7 | 100 |
| 4. | Occupation | | | | | | |
| | Farmer labor fisherman | 11 | 12,5 | 9 | 27,3 | 20 | 16,5 |
| | Lecturer teacher PNS | 2 | 2,2 | 0 | 0 | 2 | 1,7 |
| | Self-employed manning the kiosk | 4 | 4,5 | 4 | 12,1 | 8 | 6,6 |
| | Housewives at home | 59 | 67 | 15 | 45,5 | 74 | 61,1 |
| | Retired | 11 | 12,5 | 5 | 15,1 | 16 | 13,2 |
| | Others | 1 | 1,1 | 0 | 0 | 1 | 0.8 |
| | Sub total | 88 | 100 | 33 | 100 | 121 | 100 |

The mean age of elderly in urban areas is 68 years and in rural areas is 65 years. The highest age group visiting the elderly IHSCoE is 60-70 years old. The maximum age of respondents in urban areas is 86 years, while in rural areas the maximum is 80 years, Respondents are classified as independent elderly people, who can still visit the elderly IHSCoE without assistive devices such as wheelchairs or being carried. Even though they suffer from degenerative diseases, it is expected that elderly people have an optimal quality of life so that they can carry out daily activities and check their health independently. Most of the elderly even come alone using public transportation or motorbike taxis (motorbike rental) without being accompanied by their family or neighbors, they must be more vigilant to avoid physical trauma, injury or falls. As you get older, the number of degenerative diseases (NCD) is increasing in each elderly individual.

The percentage of elderly women (80%), who participated in the study is more than the male elderly and 68% of the elderly live with their married partners. Elderly who still have a life partner can care for and care for one another. Psychologically, her life is also calmer because she has friends to communicate with.

**Table 2: Distribution of elderly suffering from non-communicable diseases (NCD) and efforts to gain access to NCD services during the COVID-19 pandemic in urban and rural areas**

| No. | Variable | Urban | | Rural | | Sub Total | |
|---|---|---|---|---|---|---|---|
| | | n | % | n | % | n | % |
| 1. | **Is NCD being afflicted by the elderly?** | | | | | | |
| | Yes | 69 | 78,4 | 29 | 87,9 | 98 | 81 |
| | No | 19 | 21,6 | 4 | 12,1 | 23 | 19 |
| | Total | 88 | 100 | 33 | 100 | 121 | 100 |
| 2. | **Are you currently taking drugs related to NCD?** | | | | | | |
| | Yes | 48 | 54,5 | 19 | 57,6 | 67 | 55,4 |
| | No | 40 | 45,5 | 14 | 42,4 | 54 | 44,6 |
| | Total | 88 | 100 | 33 | 100 | 121 | 100 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 3. | **Types of non-communicable diseases that are consumed today** | | | | | | |
| | No medication | 30 | 34,1 | 11 | 33,3 | 41 | 33,9 |
| | Anti hypertension | 30 | 38,6 | 10 | 30,3 | 40 | 36,4 |
| | Drugs for Hearth diseases | 0 | 0 | 1 | 3,0 | 1 | 0,8 |
| | Oral anti diabetic | 3 | 3,4 | 1 | 3,0 | 4 | 3,3 |
| | Cholesterol drugs | 2 | 2,3 | 2 | 6,1 | 4 | 3,3 |
| | teoartritis drugs | 9 | 10,2 | 5 | 15,2 | 14 | 11,6 |
| | Other type of drugs | 10 | 11,4 | 3 | 9,1 | 13 | 10,7 |
| | Total | 88 | 100 | 33 | 100 | 121 | 100 |
| 4. | **Do you still going out in pandemic?** | | | | | | |
| | No | 55 | 62,5 | 22 | 66,7 | 77 | 63,6 |
| | Yes | 31 | 35,2 | 11 | 33,3 | 42 | 34,7 |
| | Probably | 2 | 2,3 | 0 | 0 | 2 | 1,7 |
| | Total | 88 | 100 | 33 | 100 | 121 | 100 |

As many as 78.4% of respondents in urban areas admit that they have NCD, while in rural areas 87.9%, however, not all respondents who admit to having NCD take drugs. This may be because at the time of the interview regarding drug consumption, the NCD drug supplies for elderly had run out and could not access further drugs.

**Table 3: Health protocol efforts undertaken by elderly**

| No. | Variable | Urban | | Rural | | Sub Total | |
|---|---|---|---|---|---|---|---|
| | | n | % | n | % | n | % |
| 1. | **Using mask** | | | | | | |
| | Yes | 88 | 100 | 33 | 100 | 121 | 100 |
| | No | 0 | 0 | 0 | 0 | 0 | 0 |
| | Total | 88 | 100 | 33 | 100 | 121 | 100 |
| 2. | **Hand wash** | | | | | | |
| | Yes | 84 | 95,5 | 32 | 97 | 116 | 95,9 |
| | Occasionally | 4 | 4,5 | 1 | 3,0 | 5 | 4,1 |
| | Total | 88 | 100 | 33 | 100 | 121 | 100 |
| 4. | **Eat nutritious food** | | | | | | |
| | Yes | 84 | 95,5 | 33 | 100 | 117 | 96,7 |
| | No | 1 | 1,1 | 0 | 0 | 1 | 0,8 |
| | Occasionally | 3 | 3,4 | 0 | 0 | 3 | 2,5 |
| | Total | 88 | 100 | 33 | 100 | 121 | 100 |
| 5 | **Regular exercise** | | | | | | |
| | Almost everyday | 51 | 58 | 21 | 63,6 | 72 | 59,5 |
| | Never | 15 | 17 | 4 | 12,1 | 19 | 15,7 |
| | Occasionally | 22 | 25 | 8 | 24,2 | 30 | 24,8 |
| | Total | 88 | 100 | 33 | 100 | 121 | 100 |
| 6 | **Sun exposure** | | | | | | |
| | Yes | 67 | 76,1 | 31 | 93,9 | 98 | 81 |
| | No | 8 | 9,1 | 2 | 6,1 | 10 | 8,3 |
| | Occasionally | 13 | 14,8 | 0 | 0 | 13 | 10,7 |
| | Total | 88 | 100 | 33 | 100 | 121 | 100 |

The results of physical examination and their relationship with access to health services for non-communicable diseases. In this study, in addition to interviews, elderly was measured for height and weight, as well as rapid laboratory tests in the form of examining total cholesterol and blood sugar levels at any time.

The results of the physical examination, namely height and weight, were then used to calculate the body mass index, which was then categorized according to the criteria for BMI Asia Pacific. As for systolic and diastolic blood pressure, it is categorized based on the provisions of JNC VII, 2003, PERKI, 2015.

**Risk factor of**

**Table 4: Overview of the Body Mass Index of Research Respondents**

| No. | Variable | Urban | | Rural | | Sub Total | |
|---|---|---|---|---|---|---|---|
| | | n | % | n | % | n | % |
| A | **Body Mass Index** | | | | | | |
| | Low body weight | 13 | 14,8 | 6 | 18,2 | 19 | 15,7 |
| | Normal | 35 | 39,8 | 7 | 21,2 | 42 | 34,7 |
| | Overweight | 18 | 20,5 | 8 | 24,2 | 26 | 21,5 |
| | Obesitas 1 | 7 | 8 | 6 | 18,2 | 13 | 10,7 |
| | Obesitas 2 | 15 | 17 | 6 | 18,2 | 21 | 17,4 |
| | Total | 88 | 100 | 33 | 100 | 121 | 100 |
| B | **Systole blood pressure** | | | | | | |
| | **Normal** | 34 | 38,6 | 17 | 51,5 | 51 | 42,1 |
| | Consume medicine | 15 | 44,1 | 7 | 41,2 | 22 | 43,1 |
| | No medicine | 19 | 55,9 | 10 | 58,8 | 29 | 56,9 |
| | **Stage I hypertension** | 29 | 33 | 10 | 30,3 | 39 | 32,2 |
| | Consume medicine | 17 | 58,6 | 9 | 90 | 26 | 66,7 |
| | No medicine | 12 | 41,4 | 1 | 10 | 13 | 33,3 |
| | **Stage II hypertension** | | 18,2 | | 0 | | 13,2 |
| | Consume medicine | 10 | 62,5 | 0 | 0 | 10 | 65,2 |
| | No medicine | 6 | 37,5 | 0 | 0 | 6 | 37,5 |
| | **Stage III hypertension** | 9 | 10,2 | 6 | 18,2 | 15 | 12,4 |
| | Consume medicine | 6 | 66,7 | 3 | 50 | 9 | 60 |
| | No medicine | 3 | 33,3 | 3 | 50 | 6 | 40 |

The percentage of patients with grade 3 systole hypertension in rural areas is higher than in urban areas. This may happen because access to health services in urban areas is easier. Closer distance and easy-to-get transportation make it easier for elderly in urban areas to control blood pressure and get anti-hypertensive drugs. In the data, it is found that patients with grade 3 hypertension in urban areas consume more drugs than those in rural areas.

Table 4 shows that the elderly who suffer from hypertension systole and even diastole (Table 5) both live in urban and rural areas. Most of them do not take drugs. This shows that awareness of blood pressure control and also consumption of drugs to treat blood pressure may decrease during this COVID-19 pandemic. Elderly, who suffers from NCD, usually comes to the health center every month or follows an integrated service post for the elderly.

**Table 5: Distribution of diastolic blood pressure status based on drug consumption among urban and rural respondents**

| No. | Variables | Urban | | Rural | | Sub Total | |
|---|---|---|---|---|---|---|---|
| | | n | % | n | % | n | % |
| 1 | **Diastole blood pressure** | | | | | | |
| | **Normal** | 63 | 71,6 | 20 | 60,6 | 83 | 68,6 |
| | Consume medicine | 33 | 52,4 | 10 | 50 | 43 | 51,8 |
| | No medicine | 30 | 47,6 | 10 | 50 | 40 | 48,2 |
| | **Stage I hypertension** | 13 | 14,8 | 6 | 18,2 | 19 | 15,7 |
| | Consume medicine | 9 | 69,2 | 4 | 66,7 | 13 | 68,4 |
| | No medicine | 4 | 30,8 | 2 | 33,3 | 6 | 31,6 |
| | **Stage II hypertension** | 4 | 4,5 | 5 | 15,2 | 9 | 7,4 |
| | Consume medicine | 2 | 50 | 4 | 80 | 6 | 66,7 |
| | No medicine | 2 | 50 | 1 | 20 | 3 | 33,3 |
| | **Stage III hypertension** | 8 | 9,1 | 2 | 6,1 | 10 | 8,3 |
| | Consume medicine | 4 | 50 | 1 | 50 | 5 | 50 |
| | No medicine | 4 | 50 | 1 | 50 | 5 | 50 |
| 2 | **Total cholesterol level** | 88 | 100 | 33 | 100 | 121 | 100 |
| | Normal | 18 | 20,5 | 7 | 21,2 | 25 | 20,7 |
| | Hypercholesterolemia | 70 | 79,5 | 26 | 78,8 | 96 | 79,3 |
| 3 | **Non fasting blood glucose level** | 88 | 100 | 33 | 100 | 121 | 100 |
| | Normal | 82 | 93,2 | 27 | 81,8 | 109 | 90,1 |
| | Diabetes | 6 | 6,8 | 6 | 18,2 | 12 | 9,9 |

**Table 6: The mean of health indicator of elderly in rural and urban area**

| Measurements | | N | Mean | Std. Deviation | Std. Error Mean | p |
|---|---|---|---|---|---|---|
| BMI | Urban | 88 | 22.689 | 4.3329 | .4619 | 0.43 |
| | Rural | 33 | 23.558 | 4.7254 | .8226 | |
| Blood glucose | Urban | 88 | 118.78 | 36.859 | 3.929 | 0.00 |
| | Rural | 33 | 139.03 | 90.031 | 15.672 | |
| Total Cholesterol | Urban | 88 | 235.56 | 48.913 | 5.214 | 0.44 |
| | Rural | 33 | 235.21 | 53.567 | 9.325 | |
| Uric acid | Urban | 88 | 5.93 | 1.471 | .157 | 0.67 |
| | Rural | 33 | 6.19 | 1.747 | .304 | |
| Diastole Blood pressure | Urban | 88 | 86.44 | 12.826 | 1.367 | 0.40 |
| | Rural | 33 | 87.36 | 14.311 | 2.491 | |
| Systole blood pressure | Urban | 88 | 148.78 | 26.598 | 2.835 | 0.56 |
| | Rural | 33 | 144.79 | 29.291 | 5.099 | |

The statistic used t-test to compare the mean of measurement between two groups ($p<0,05$)

## DISCUSSION

The data shown that most of the elderly in urban and rural areas still have a life partner and they are still working. In old age, a person has at least one of the non-communicable diseases, and with a life partner, they can maintain each other's health quality. Life partners can be good partners in reminding the time of health control, time to take medication to maintain normal blood pressure or blood sugar. a life partner also gives the spirit to stay active and feel happy in living everyday life [3, 4].

During the COVID-19 pandemic, the government temporarily closed primary health services for the elderly. The Elderly integrated health service center for the elderly (IHSCoE) provided by the government at the sub district or village level, managed by the community, is a primary health service for the elderly by providing promotive and preventive services once a month. Every time he visits, Elderly will have his weight, height, blood pressure, total cholesterol and blood sugar measured, through a rapid test device by health workers. If a problem is found from the measurement results, the elderly will be referred to a community health service center, or simply given medication.

The IHSCoE service provides easy access for the elderly because their activities take place regularly every month and the location are fixed in one place (usually the houses of residents who give up their yard or terrace for service activities). Elderly doesn't have to travel long distances or spend a lot of time on the road to control his blood pressure, or have his sugar, cholesterol or uric acid levels checked. Another benefit of the IHSCoE service is that you can elderly meet with friends to communicate and socialize.

During this COVID-19 pandemic, the service is temporarily closed (about 5-6 months), so the opportunity for health control is reduced or there is no opportunity at all. Medicines to control blood pressure and blood sugar that have run out are also inaccessible to the elderly.

The data shows that, although the elderly suffer from non-communicable diseases, many do not take medication to maintain optimal health status. Tables 4 and 5 show that most of the elderly people with hypertension do not take antihypertensive drugs (Kluge *et al*., 2020). This also occurs in elderly people with non-communicable diseases in other countries such as Africa, Europe and Bangladesh (D'Adamo *et al*., 2020; Palmer *et al*., 2020; Taskin *et al*., 2014). The situation of the COVID-19 pandemic at the beginning of 2020 in Indonesia, caused excessive worry and anxiety, especially in the elderly. This reason also causes the elderly to be reluctant to come to health care facilities, because they are worried that they will be infected with COVID-19, as well as because their family (children or grandchildren) forbid the elderly to leave the house.

The data in Table 4 and Table 5 show that systolic blood pressure, diastolic blood pressure and total blood cholesterol levels in the elderly living in rural areas are higher than the measurement results for the elderly living in urban areas, although the average measurement results are not significantly different (Except on the results of measuring blood sugar levels). One of the factors that may be the cause is the ease of access to health services for non-communicable diseases. Elderly who lives in urban areas have easier access to independent practice services, doctors, or hospitals when the IHSCoE Service is temporarily closed. Meanwhile, elderly people living in rural areas find it difficult to access alternative health services such as those in urban areas, especially if IHSCoE services are closed or community health centers limit their working hours. This is also a problem for the elderly who live in other countries. The COVID-19 pandemic has also brought global problems to the health quality of independent elderly people suffering from NCD (COVID-19 AND NCDs, n.d.; D'Adamo *et al*., 2020b; Verma *et al*., 2019).

The results of this study indicate that the elderly who live in urban and rural areas have good awareness to continue implementing health protocols to prevent contracting COVID-19, this is in line with the research of Amalo et al., in the city of Kupang where the habit of washing hands with soap has become a new habit in the community during the COVID-19 pandemic (Amalo *et al*., 2021). Eating nutritious food is also one of the good habits applied by the elderly in urban and rural areas. This habit must be maintained, considering the ability to function of the teeth, chewing and absorption of nutrients in the elderly has also decreased, but the nutritional needs of them to maintain body cells, organ function and immune system function must be adequate and indispensable. The habit of sunbathing in the morning is also one of the good habits that are still applied by most of the elderly in urban and rural areas. It is possible that this habit can be formed from a young age or also because of promotive and preventive efforts during the pandemic, so that awareness to increase vitamin D from sunbathing habits is awakened [12].

## CONCUSSION

Although the elderly in the City and District of Kupang are trying to implement a healthy lifestyle and health protocols to prevent COVID-19, due to limited access to health services for non-communicable diseases for the elderly, the elderly has a high risk of non-communicable diseases. Health services in promotive and prevention action for elderly in urban area must be focus on a small community in the village. Suggestions to improve health services for non-communicable diseases in the elderly must be carried out actively. Education and communication so that the elderly continue to take drugs for risk factors for non-communicable diseases must be carried out intensively. The family is a reliable support system to help maintain the health of the elderly.

## REFERENCES


1. Taskin, T., Biswas, T., Siddiquee, A. T., Islam, A., & Alam, D. (2014). Chronic non-communicable diseases among the elderly in Bangladesh old age homes. *Int J Aging Soc*, *3*(4), 67-75.
2. Azarpazhooh, M. R., Morovatdar, N., Avan, A., Phan, T. G., Divani, A. A., Yassi, N., ... & Di Napoli, M. (2020). COVID-19 pandemic and burden of non-communicable diseases: an ecological study on data of 185 countries. *Journal of Stroke and Cerebrovascular Diseases*, *29*(9), 105089.
3. Palmer, K., Monaco, A., Kivipelto, M., Onder, G., Maggi, S., Michel, J. P., ... & Donde, S. (2020). The potential long-term impact of the COVID-19 outbreak on patients with non-communicable diseases in Europe: consequences for healthy ageing. *Aging clinical and experimental research*, *32*, 1189-1194.
4. World Health Organization. (2017). Integrated care for older people: guidelines on community-level interventions to manage declines in intrinsic capacity.
5. Kluge, H. H. P., Wickramasinghe, K., Rippin, H. L., Mendes, R., Peters, D. H., Kontsevaya, A., & Breda, J. (2020). Prevention and control of non-communicable diseases in the COVID-19 response. *The Lancet*, *395*(10238), 1678-1680.
6. Taskin, T., Biswas, T., Siddiquee, A. T., Islam, A., & Alam, D. (2014). Chronic non-communicable diseases among the elderly in Bangladesh old age homes. *Int J Aging Soc*, *3*(4), 67-75.
7. D'Adamo, H., Yoshikawa, T., & Ouslander, J. G. (2020). Coronavirus disease 2019 in geriatrics and long-term care: the ABCDs of COVID-19. *Journal of the American Geriatrics Society*, *68*(5), 912-917.
8. Verma, M., Grover, S., Tripathy, J. P., Singh, T., Nagaraja, S. B., Kathirvel, S., ... & Nehra, R. (2019). Co-existing non-communicable diseases and mental illnesses amongst the elderly in Punjab, India. *European endocrinology*, *15*(2), 106.
9. COVID-19 AND NCDs.
10. D'Adamo, H., Yoshikawa, T., & Ouslander, J. G. (2020). Coronavirus disease 2019 in geriatrics and long-term care: the ABCDs of COVID-19. *Journal of the American Geriatrics Society*, *68*(5), 912-917.
11. Amalo, P. I., Lada, C. O., Levina, E., Setianingrum, S., & Buntoro, I. F. The Relationship between Knowledge with Attitudes and Behaviors about Hand Washing using Soap in Prevention of Covid-19 in Community in Kupang City. Available from: www.ijcmr.com
12. Fanggidae, A. M., Lada, C. O., Listyawati Nurina, R., & Trisno, I. (2021). Correlation Knowledge with Attitudes and Behaviors about the Benefits of Bath in Prevention of Covid-19 in Communities in Kupang City. Available from: www.ijcmr.com.


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