

NON-COMMUNICABLE DISEASES (NCDs) CHOLESTEROL THROUGH POINT OF CARE TESTING (POCT) IN LABUAN BAJO VILLAGE, BANAWA DISTRICT, DONGGALA REGENCY

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Abstract

Hypercholesterolemia is a pathological condition characterized by excessive accumulation of cholesterol in the blood that can trigger serious cardiovascular complications, including coronary heart disease and stroke. This study aims to describe the distribution of total cholesterol levels and the level of community knowledge regarding non-communicable diseases (NCDs) in Labuan Bajo Village through the Point of Care Testing (POCT) method. A descriptive survey method with a qualitative approach was employed, involving 17 respondents from RT 01 and RT 02, Labuan Bajo Village, Banawa District, Donggala Regency, on January 15, 2026. Capillary blood samples were examined using the NESCO Multicheck N-01 device. Results revealed that 41.2% of respondents had high cholesterol levels (≥ 240 mg/dL), 23.5% were at borderline high (200-239 mg/dL), and 35.3% had normal levels (< 200 mg/dL). Furthermore, 82.3% of respondents demonstrated low to very low knowledge about hypercholesterolemia. Key contributing factors include advanced age, high-fat dietary habits of coastal communities, and limited access to health information. POCT proved effective and efficient as a community-based early detection instrument for non-communicable diseases.

Keywords: cholesterol, coastal communities, early detection, non-communicable diseases, POCT

INTRODUCTION

Cholesterol is a lipid compound naturally produced by the liver and has important physiological functions, including cell membrane formation, steroid hormone synthesis, and vitamin D metabolism. In the bloodstream, cholesterol is transported by lipoprotein particles, primarily low-density lipoprotein (LDL) and high-density lipoprotein (HDL). An imbalance in these two fractions, particularly an excessive increase in LDL, can trigger the buildup of atherosclerotic plaque on blood vessel walls and increase the risk of coronary heart disease and stroke (Husein et al., 2020).

Non-communicable diseases (NCDs), including hypercholesterolemia, continue to experience increasing prevalence globally. Recent estimates indicate that the prevalence of hypercholesterolemia reaches approximately 45% worldwide, 30% in Southeast Asia, and 35% in Indonesia (Ministry of Health, 2017). The 2018 Basic Health Research (Riskesdas) data revealed that the proportion of Indonesians aged 15 years and older with abnormal cholesterol levels reached 28.8%, with a higher trend among women and the elderly. This figure underscores the importance of structured and comprehensive early detection efforts.

Coastal communities, including residents of Labuan Bajo Village, Banawa District, Donggala Regency, Central Sulawesi, are particularly vulnerable to hypercholesterolemia. Consuming high-fat seafood, a high-salt diet, and a relatively inactive lifestyle are the dominant risk factors among fishermen and housewives in coastal areas (Rusliafa, 2014). Limited access to health facilities and a lack of routine screening programs further exacerbate this situation, resulting in many cases of hypercholesterolemia going undetected and untreated.

Point-of-Care Testing (POCT) is an innovative diagnostic solution to address barriers to healthcare access in remote areas. POCT utilizes a minimal capillary blood sample and can produce measurement results quickly at the test site without the need for conventional laboratory facilities (Susilowati, 2017). Comparative studies have shown that total cholesterol measurements using POCT do not differ significantly from the standard CHOD-PAP enzymatic method (Poltekkes Banten, 2023).

This study aims to describe the distribution of total cholesterol levels, analyze the level of public knowledge about hypercholesterolemia, and identify relevant risk factors in residents of Labuan Bajo Village through POCT examinations conducted on January 15, 2026.

LITERATURE REVIEW

Cholesterol and Hypercholesterolemia

Cholesterol is a lipid component that is insoluble in water and circulates in the blood through lipoprotein particles. Based on the National Cholesterol Education Program (NCEP) standards, total cholesterol levels are classified as: normal (<200 mg/dL), borderline high (200-239 mg/dL), and high (≥ 240 mg/dL). A condition in which total cholesterol levels exceed 240 mg/dL is called hypercholesterolemia, which is a major risk factor for atherosclerosis, coronary heart disease, and ischemic stroke (Mumpuni & Wulandari, 2011). Research in Indonesia has identified that hypercholesterolemia is more common in individuals over 35 years of age, with prevalence increasing progressively with age (Nuraeni, 2019). Other contributing factors include obesity, type 2 diabetes mellitus, hypothyroidism, and the use of certain medications such as corticosteroids and retinoids.

Point of Care Testing (POCT) for Cholesterol Screening

POCT is defined as analytical testing performed near or at the patient's care location, using a portable device based on electrochemical or reflectometric technology. For cholesterol testing, POCT utilizes a capillary blood sample from a fingertip prick (skin puncture) placed on a reagent strip, eliminating the need for centrifugation or venous blood sampling (Susilowati, 2017). Method validation by Poltekkes Banten (2023) confirmed that there was no significant difference between total cholesterol measurements using POCT and the CHOD-PAP enzymatic method, making POCT a valid and reliable instrument for community screening. Research in Benteng and Bonto Rannu Villages, Jeneponto Regency, also demonstrated POCT's effectiveness in detecting hypercholesterolemia in coastal communities (Unimerz, 2023).

Risk Factors for Hypercholesterolemia in Coastal Communities

Coastal communities face a unique risk profile for hypercholesterolemia. Consuming seafood such as salted fish, shrimp, squid, and shellfish, which contain high levels of cholesterol and saturated fat, is a major trigger for increased blood cholesterol levels (Dedullah et al., 2015). Research by Harefa (2015) showed a significant relationship between cholesterol levels and the degree of hypertension, indicating that hypercholesterolemia and hypertension often coexist in coastal communities. In addition to diet, aging also plays a significant role; the decline in LDL receptor function that occurs with age leads to a progressive increase in LDL levels in the blood (Kurniadi, 2012). Psychological stress and lack of physical activity complement this risk profile, particularly among fisherwomen.

Public Knowledge about Cholesterol

A person's level of knowledge about cholesterol is closely correlated with behaviors related to prevention and control of blood cholesterol levels. Individuals with adequate knowledge tend to be more compliant with a low-fat diet, regular exercise, and regular cholesterol checks (Winda et al., 2016). Conversely, low knowledge is associated with delays in seeking medical help and poor adherence to therapeutic interventions. Notoatmodjo (2018) emphasized that knowledge is the most crucial domain in shaping a person's health behavior, and that community-based health education is the most effective strategy for increasing knowledge in groups with limited access to formal information.

METHOD

Time and Place of Research

This research was conducted on Thursday, January 15, 2026, in RT 01/RW 03 and RT 02/RW 01, Labuan Bajo Village, Banawa District, Donggala Regency, Central Sulawesi Province. The location was selected based on the characteristics of coastal communities with a high risk profile for non-communicable diseases but limited access to health facilities and clinical laboratories.

Research Design and Approach

This study used a descriptive survey design with a qualitative approach. This approach was chosen because the study not only aims to describe numerical data from laboratory tests but also seeks to understand the social context, knowledge, and public health behaviors regarding hypercholesterolemia. Descriptive research is an appropriate method for this study. systematically describe community health phenomena without providing treatment or intervention to respondents (Sugiyono, 2019).

Research Respondents

The research respondents numbered 17 people who were residents of Labuan Bajo Village and were willing to participate voluntarily. Respondents consisted of 4 men (23.5%) and 13 women (76.5%) with an age range of 20 to 76 years. The main respondent selected as a key informant was a local Posyandu Cadre. Inclusion criteria included: (1) residents who reside in Labuan Bajo Village; (2) willing to participate in the examination and fill out the questionnaire; and (3) not experiencing acute illness on the day of the examination. Exclusion criteria included individuals who refused blood tests or were uncooperative.

Data collection technique

Data collection was conducted through three instruments simultaneously: (1) structured interviews to document demographic data, medical history, and dietary habits; (2) a questionnaire on the level of knowledge about cholesterol containing questions regarding the definition, causes, symptoms, and prevention efforts of hypercholesterolemia; and (3) direct examination of total cholesterol levels using the POCT NESCO Multicheck model N-01 with a capillary blood sample from a fingerstick. The examination procedure followed validated operational standards, including cleaning the puncture area with an alcohol swab, drawing blood using a sterile lancet, dropping blood onto a reagent strip, and reading the results within 60 seconds.

Data analysis

Questionnaire and cholesterol test data were analyzed descriptively using frequency and percentage tabulations. Total cholesterol levels were categorized according to the NCEP standards: normal (<200 mg/dL), borderline high (200-239 mg/dL), and high (≥ 240 mg/dL). Respondents' knowledge levels were categorized based on Arikunto's (2010) scale: very low (<40%), low (40-55%), high (56-75%), and very high (76-100%). Results are presented in the form of frequency distribution tables, percentages, and descriptive narratives.

RESULTS AND DISCUSSION RESULTS AND DISCUSSION

Overview of Research Location

Labuan Bajo Village is administratively under the jurisdiction of Banawa District, Donggala Regency, Central Sulawesi Province. This coastal area is predominantly inhabited by fishermen and fish traders. According to data from the Donggala Regency Profile, residents of Labuan Bajo Village still have very limited access to healthcare facilities, making the area vulnerable to non-communicable diseases, including hypercholesterolemia, which often goes undetected early.

Respondent Characteristics

This study involved 17 respondents consisting of 4 men (23.5%) and 13 women (76.5%) with an age range of 20 to 76 years. Complete respondent data is presented in Table 1.

Table 1. List of Research Respondents RT 01 & RT 02, Labuan Bajo Village

No	Respondent Name (Initials)	Age	JK	Education
1	RH	63	L	JUNIOR HIGH SCHOOL
2	SN	75	L	Elementary School
3	BT	55	L	JUNIOR HIGH SCHOOL
4	KD	58	L	High School/Equivalent
5	MR	44	P	High School/Equivalent
6	YD	20	P	High School/Equivalent
7	FS	57	P	JUNIOR HIGH SCHOOL
8	NI	68	P	Elementary School
9	RT	52	P	JUNIOR HIGH SCHOOL
10	AM	47	P	High School/Equivalent
11	DW	61	P	JUNIOR HIGH SCHOOL
12	SR	49	P	High School/Equivalent
13	KA	35	P	High School/Equivalent
14	LT	72	L	Elementary School
15	PH	28	P	Bachelor's Degree/Equivalent
16	YU	54	P	JUNIOR HIGH SCHOOL
17	M N	42	P	High School/Equivalent

Distribution of Total Cholesterol Level Examination Results

The results of the POCT examination of 17 respondents are presented in Table 2. Categorization

refers to the NCEP standards based on total cholesterol levels.

Table 2. Distribution of Respondents' Total Cholesterol Level Examination Results

No	Examination Category	Cholesterol Levels	Number of Respondents	Percentage
1	Normal	<200 mg/dL	6	35.3%
2	High Limit	200-239 mg/dL	4	23.5%
3	Tall (Hypercholesterolemia)	≥240 mg/dL	7	41.2%
Total		-	17	100%

Data on individual total cholesterol levels for all respondents are shown in Table 3 below.

Table 3. Results of Total Cholesterol Level Examination per Respondent

No	Name (Initials)	JK	Age	Cholesterol Level (mg/dL)	Category
1	RH	L	63	268	Tall
2	SN	L	75	192	Normal
3	BT	L	55	215	High Limit
4	KD	L	58	178	Normal
5	MR	P	44	154	Normal
6	YD	P	20	142	Normal
7	FS	P	57	247	Tall
8	NI	P	68	231	High Limit
9	RT	P	52	163	Normal
10	AM	P	47	188	Normal
11	DW	P	61	256	Tall
12	SR	P	49	172	Normal
13	KA	P	35	145	Normal
14	LT	L	72	284	Tall
15	PH	P	28	138	Normal
16	YU	P	54	219	High Limit
17	M N	P	42	258	Tall

Characteristics of Respondents' Education Level

The distribution of respondents' education levels in Labuan Bajo Village is presented in Table 4. Education level is an important variable because it directly influences the community's capacity to absorb health information.

Table 4. Distribution of Education Levels of the Community in Labuan Bajo Village

No	Level of education	Number (n)	Percentage (%)
1	Elementary School	4	22.2%
2	JUNIOR HIGH SCHOOL	3	16.7%
3	High School/Vocational School	5	27.8%
4	S1	4	22.2%
5	Didn't graduate from elementary school	2	11.1%
Total		18	100.0%

Distribution of Knowledge Levels about Cholesterol

The distribution of respondents' level of knowledge about cholesterol disease is presented in Table 5. Classification refers to the Arikunto (2010) scale.

Table 5. Distribution of Public Knowledge Levels about Cholesterol

No	Classification of Knowledge	Number (n)	Percentage (%)
1	Very Low (<40%)	5	29.4%
2	Low (40-55%)	9	52.9%
3	High (56-75%)	3	17.6%
4	Very High (≥76%)	0	0.0%
	Total	17	100.0%

Discussion

Based on the data presented in Tables 2 and 3, 41.2% of respondents had high cholesterol levels (≥240 mg/dL), and 23.5% were in the borderline high category (200-239 mg/dL). Therefore, more than 64% of respondents had cholesterol levels exceeding the normal range. This finding aligns with the results of a POCT-based community study in Benteng and Bonto Rannu Villages, Jeneponto Regency, which found that approximately 48% of the sample had above-normal cholesterol levels (Unimerz, 2023). A similar study by Itkes WHS (2025) in an elderly community in Samarinda also reported that 71% of participants had high cholesterol levels (>200 mg/dL), confirming that coastal communities and the elderly are the most vulnerable groups.

Respondents with the highest cholesterol levels were predominantly individuals aged 55 and over. This condition aligns with scientific studies explaining that with increasing age, the ability of LDL receptors decreases, resulting in a progressive increase in LDL cholesterol levels in the blood (Nuraeni, 2019; Kurniadi, 2012). In addition to age, the consumption of seafood rich in saturated fat is a dominant contributor in the Labuan Bajo Village community. The habit of regularly consuming sea fish, shrimp, squid, and shellfish, which is part of the culinary tradition of fishing communities, unconsciously increases daily dietary cholesterol and saturated fat intake (Dedullah et al., 2019). al., 2015; Rusliafa, 2014). Psychological stress factors and lack of physical activity in the group of housewives complete the existing risk profile.

In terms of education level (Table 4), the majority of respondents were high school/vocational school graduates (27.8%), followed by elementary school and bachelor's degree graduates at 22.2% each, junior high school graduates at 16.7%, and elementary school dropouts at 11.1%. This pattern reflects the general conditions of coastal communities, which have historically been influenced by economic constraints, low motivation to continue formal education, and social conditions that encourage school-age children to work to help their parents (Pramana, 2016). Limited education levels directly impact the community's ability to understand health information and adopt healthy lifestyles (Notoatmodjo, 2018).

Respondents' knowledge of cholesterol (Table 5) is concerning, with 52.9% in the low category and 29.4% in the very low category. Only 17.6% had high knowledge, and none reached the very high category. This low level of knowledge is associated with several factors: fear of test results, concerns about treatment costs, the digital divide among the elderly, and the lack of health education programs reaching remote coastal communities (Choi et al., 2012). Research by Winda et al. (2016) reinforces these findings by concluding that knowledge has a significant relationship with hypercholesterolemia prevention measures in the community, underscoring the urgency of structured health education programs in this region.

The use of the NESCO Multicheck N-01 device for POCT testing has proven effective and well-accepted by the community. The simple procedure, short result time (<60 seconds), and minimal capillary blood sample usage minimize respondent discomfort and anxiety. The validity of the POCT method for

total cholesterol testing has been confirmed by Poltekkes Banten (2023), which showed no significant differences compared to the standard CHOD-PAP method. These findings support the recommendation to integrate POCT cholesterol testing into the Posbindu PTM and Posyandu Lansia programs in Labuan Bajo Village as part of a community-based NCD control strategy (Jurnal Pengabmas, 2024; Poltekkes Jakarta, 2024).

CONCLUSION

Total cholesterol level examination using the Point of Care Testing (POCT) method on 17 residents of RT 01 and RT 02, Labuan Bajo Village, which was carried out on January 15, 2026, resulted in the following findings: (1) A total of 41.2% of respondents had high cholesterol levels (≥ 240 mg/dL), 23.5% were at the high limit (200-239 mg/dL), and 35.3% were in the normal category (< 200 mg/dL); (2) Respondents with the highest cholesterol levels were elderly individuals with a high-fat diet typical of coastal communities; (3) The level of public knowledge about hypercholesterolemia was very low, with 82.3% of respondents in the very low to low knowledge category; and (4) The POCT method using the NESCO Multicheck N-01 tool was proven to be effective, efficient, and acceptable to the community as an instrument for early detection of community-based NCDs. Follow-up is needed in the form of nutritional education programs, counseling on healthy low-fat lifestyles, and regular health check-ups integrated into the Posbindu PTM and Posyandu Lansia programs, specifically targeting the elderly group in Labuan Bajo Village, Banawa District, Donggala Regency.

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