
SIMPLE NUTRITION SCREENING TOOL (SNST) IN NUTRITIONAL ASSESSMENT AS A RISK FACTOR FOR CARDIOVASCULAR DISEASE IN THE ELDERLY

Ratna Indriawati^{1*}, Muhammad Rivai Azis¹

¹Fakultas Ilmu Kedokteran dan Kesehatan, Universitas Muhammadiyah Yogyakarta, Yogyakarta

*Correspondence email: r_indriawatiwibowo@yahoo.com

ABSTRACT

The elderly with nutritional disorders requires healing complications in their disease. Nutrient intake for the elderly with illness is needed for the healing process and to prevent further complications. One of the biggest factors of mortality in old age is non-communicable diseases, namely cardiovascular disease. This study aims to determine the relationship between the Simple Nutritional Screening Tool (SNST) in nutritional assessment and risk factors for cardiovascular disease in the elderly. This study used a cross-sectional method which was conducted for three months with a total of 51 respondents. Primary data collection was done by an interview with a questionnaire guide. Anthropometric and biochemical data from medical records. The results showed that SNST data showed that 92.20% were not at risk of malnutrition, and 7.80% were at risk of malnutrition. Chi-Square test between body mass index (BMI), blood pressure, LDL, HDL, blood sugar, smoking behavior, food intake, diet, and eating frequency as cardiovascular risk factors with SNST was not significant ($p > 0.05$). The research concludes that there is no relationship between SNST and body mass index (BMI), blood pressure, LDL, HDL, blood sugar, smoking behavior, food intake, eating patterns, and eating frequency as cardiovascular risk factors in the elderly.

Keywords: SNST; Cardiovascular; Nutritional Assessment; Elderly.

INTRODUCTION

Nutrition is needed for elderly people to maintain their quality of life. For elderly patients, nutritional intake is needed to cure and prevent complications in their illness. Nutritional intake is needed for healthy elderly people to maintain their quality of life. Meanwhile, for the elderly who are sick, nutritional intake is needed for the healing process and to prevent further complications from occurring.^{1,2}

In the stages of age, the elderly category can also experience a state of good nutrition and malnutrition. In Indonesia, the data shows that in the elderly category who are in a state of malnutrition as much as 3.4%, underweight 28.3%, ideal body weight is 42.4%, overweight as much as 6.7%, and obesity 3, 4%.^{3,4}

According to the Ministry of Health, the aging process will deteriorate one's physical

and mental abilities. In general, most organ disorders are complained of by the elderly. In addition, according to the results of studies that have been done, one of the health problems that often occur in the elderly is cardiovascular disease. Some risk factors that affect cardiovascular disease are age, sex, smoking, stress, alcohol consumption, salt consumption, income, nutritional status, and obesity.⁵⁻⁷

Cardiovascular disease, which is included in the category of non-communicable diseases, is the number one cause of death every year. In 2008 an estimated 17.3 million deaths were caused by cardiovascular disease. More than 3 million deaths occurred before the age of 60 years and should be preventable. "Early" deaths caused by heart disease occur in the range of 4% in high-income countries to 42% in low-income countries. Deaths caused by cardiovascular disease, especially coronary heart disease and

stroke, are expected to continue to increase, reaching 23.3 million deaths in 2030.^{5,7} Several studies have used SNST for nutrition.^{8,9} The relationship between SNST in nutritional assessment and risk factors for cardiovascular disease in the elderly needs to be investigated.

MATERIAL AND METHODS

This study used a cross-sectional method that was conducted for three months with a total of 51 respondents. Primary data collection is done by interview using a guide questionnaire. Secondary data retrieval is done to obtain anthropometric and biochemical data. Place of research in Internal Medicine Polyclinic at Wonosari Regional Hospital, Gunungkidul Regency, Yogyakarta, Indonesia.

The subjects of this study were men and women aged ≥ 60 years, able to communicate with, willing to take part in the research. Exclusion criteria included persons with speech and/or hearing impairments. The sample size is determined by total sampling. The independent variable of this study is the risk factor for suffering from cardiovascular disease, while the dependent variable is the SNST value.

Operational definition

SNST as Nutritional Assessment. The SNST was a nutritional screening tool used to identify patients at risk of malnutrition. SNST is a nutritional screening tool using 6 (six) indicators, namely: (1) Does the patient appear thin. (2) Whether the patient's clothing feels looser. (3) Has there been any weight loss in the last six months. (4) Has the patient experienced a decrease in food intake during the past one week. (5) Whether the patient has an illness that changes the amount or type of food eaten. (6) Does the patient look limp. SNST has a maximum score of 6, with the following assessment criteria: not at risk of malnutrition (score 0 – 2) and risk of malnutrition (score ≥ 3)

Cardiovascular risk factors are conditions, traits, physical or behavioral that can increase the incidence of cardiovascular disease, which include: blood pressure

(pressure produced by the heart pump to move blood throughout the body. Blood pressure limits according to WHO are normal (120/80 mmHg), hypertension ($>140/90$ mmHg), hypotension ($<90/60$ mmHg). Body Mass Index (BMI) according to WHO is: lean (<17); normal (17-24), obesity (> 24). HDL, HDL limits according to PERKI (2013) are: normal (≥ 35 mg / dL), low (<35 mg / dL). LDL, the limit of LDL according to PERKI (2013) is: normal (<100 mg / dL), high (> 130 mg / dL). According to PERKI (2013), blood glucose is: diabetes (≥ 200 mg / dL), normal (<100 mg / dL). Smoking behavior is the smoking behavior of respondents. Data obtained from direct interviews.

Research Instruments

The research instrument is the tool used for data collection (Notoadmodjo, 2010). In this study, the instruments used included: Informed Consent, respondent data questionnaire, nutritional anthropometric questionnaire, biochemical questionnaire (biochemical indicators are used as a measure of a person's ability to meet physiological needs for certain nutrients (Siagian, 2010). SNST Questionnaire.

Data Collection Method

Data collection was carried out using structured interviews with questionnaires. Secondary data collection includes anthropometric and biochemical data

Data analysis

Before being analyzed, the questionnaire that has been filled in is given a number/code and has been reviewed to make it easier to enter data, edit data, and process data into a computer. The data collected is then grouped according to the type and function in research according to variables. To find out the relationship between variables, tests are used. Chi-Square or Kai Squared (X²) statistics using the SPSS for windows program.

Research Ethics

This study has received an Ethical Clearance from the Ethics Commission of the Medical Faculty and Health Science of UMY.

RESULT

The number of respondents who met the requirements in this study was 51 people. Table 1 shows the characteristics of research

subjects. Most of the respondents were male (54.90%) and aged between 61-70 years (37.30%).

Table 1. Characteristics of Research Subjects

Gender	n	(%)
Male	28	54.90
Female	23	45.10
n	51	100
Age (years)		
50 – 60	12	23.50
61 – 70	19	37.30
71 – 80	17	33.30
81 – 90	3	5.90
n	51	100

The respondents measured by SNST using six indicators showed that patients who were not at risk of malnutrition (score: 0-2)

were 92.20%. Meanwhile, patients at risk of malnutrition (score: ≥ 3) were 7.80%.

Table 2. Distribution of Respondents according to SNST Score

Indicators	Score	n	%
Indicator 1	Yes (1)	12	23.50
	No (2)	39	76.50
	Total	51	100
Indicator 2	Yes (1)	12	23.50
	No (2)	39	76.50
	Total	51	100
Indicator 3	Yes (1)	5	9.80
	No (2)	46	90.20
	Total	51	100
Indicator 4	Yes (1)	4	7.80
	No (2)	47	92.20
	Total	51	100
Indicator 5	Yes (1)	5	9.80
	No (2)	46	90.20
	Total	51	100
Indicator 6	Yes (1)	0	0
	No (2)	51	100
	Total	51	100
Total	No Risk of Malnutrition (score : 0-2)	47	92.20
	Risk of Malnutrition (score : ≥ 3)	4	7.80
	Total	51	100

Indicator 1: Does the patient look thin, an indicator? 2: Do the patient's clothes feel looser? Get the highest score compared to the score ratings on other indicators. The score

for indicator one and indicator 2 is 23.50% each. These two indicators are closely related because when the patient looks thin, aesthetically, the clothes worn will also

look/feel loose. The data from table 2 shows that on indicator 6: Does the patient look weak, the assessment score is 0 (zero). This

shows that for all respondents measured during the study period, the patient's general condition is good /not weak.

Table 3. Distribution of Respondents according to Cardiovascular Risk Factors

Risk Factors	Category	n	%
BMI (kg/m ²)	Thin (10 – 17)	3	5.90
	Normal (18 – 24)	39	76.50
	Obesity (25 – 35)	9	17.60
	Total	51	100
Blood Pressure (mmHg)	Normal (120/80 mmHg)	20	39.20
	Hypertension (121/80 -140/90 mmHg)	31	60.80
	Total	51	100
	HDL (mg/dL)	Normal (35-110 mg/dL)	51
LDL (mg/dL)	Low (<35 mg/dL)	0	0
	Total	51	100
	Normal (50-130 mg/dL)	18	35.30
	High (131-200 mg/dL)	33	64.70
Blood Glucose (mg/dL)	Total	51	100
	Normal (50-100 mg/dL)	11	21.60
	Diabetic (101-250 mg/dL)	40	78.40
	Smoking Behavior	Total	51
Smoking		28	54.90
No smoking		23	45.10
Food supply (% of requirement)		Total	51
	100 %	20	39.20
	50 – 99 %	12	23.50
	Fasting	19	37.30
The diet that is followed	Total	51	100
	Diet	0	0
	No diet	51	100
	Feeding Frequency	Total	51
2 x/day		19	37.30
3 x/day		32	62.70
Total		51	100

The high percentage of wasting and obesity shows that in the elderly, there are still multiple nutritional problems, namely malnutrition and obesity, that must be prevented and overcome. The results of blood pressure measurements show that most of the respondents (60.80%) suffer from hypertension. This shows that hypertension in the elderly is still quite high. The results of HDL Cholesterol measurement showed that 100% of respondents had normal HDL

Cholesterol levels (Table 3.). As for the results of LDL Cholesterol measurement, the results obtained were 64.70% high LDL Cholesterol levels (Table 3). The results of measuring blood sugar levels showed that most respondents had diabetes, while the results of the behavioral assessment of the majority (54.90%) of respondents smoked. The assessment results of food intake compared to the percentage of ideal need figures showed that 39.20% was 100%

sufficient. However, 37.30% fasting. The low number of 100% adequacy of the ideal intake is a separate problem that must be evaluated for its causal factors. The results of the assessment of dietary behavior, 100% of

respondents did not undergo a dietary diet. While the results of the assessment of the frequency of eating were 62.70% of respondents had eaten three times/ day.

Table 4. Relationships between variables include the relationship between Simple Nutrition Screening Tool (SNST) with cardiovascular risk factors

Risk Factors	Category	SNST						p
		Not Risky Malnutrition		Malnutrition		Total		
		n	%	n	%	n	%	
BMI	Thin (10 – 17)	2	3.90	1	2.00	3	5.90	0.199
	Normal (18 – 24)	37	72.50	2	3.90	39	76.50	
	Obesity (25 – 35)	8	15.70	1	2.00	9	17.60	
	Total	47	92.20	4	7.80	51	100	
Blood Pressure (mmHg)	Normal (120/80 mmHg)	18	35.30	2	3.90	20	39.20	0.514
	Hypertension (121/80–140/90 mmHg)	29	56.90	2	3.90	31	60.80	
	Total	47	92.20	4	7.80	51	100	
	Low (<35 mg/dL)	0	0	0	0	0	0	
	Total	47	92.20	4	7.80	51	100	
LDLCholesterol (mg/dL)	Normal (50-130 mg/dL)	17	33.30	1	2.00	18	35.30	0.654
	High (131-200 mg/dL)	30	58.80	3	5.90	33	64.70	
	Total	47	92.20	4	7.80	51	100	
Blood Sugar (mg/dL)	Normal (50-100 mg/dL)	37	72.50	3	5.90	40	78.40	0.862
	Diabetes (101-250 mg/dL)	10	19.60	1	2.00	11	21.60	
	Total	47	92.20	4	7.80	51	100	
Smoking Behavior	Smoke	25	49.00	3	5.90	28	54.90	0.383
	Do not smoke	22	43.00	1	2.00	23	45.10	
	Total	47	92.20	4	7.80	51	100	
Food Supply (% of daily need)	100 %	18	35.30	2	3.90	20	39.20	0.857
	50 – 99 %	11	21.60	1	2.00	12	23.50	
	Fasting	18	35.30	1	2.00	19	37.30	
	Total	47	92.20	4	7.80	51	100	
Frequency of Eating	2 times / day	17	33.30	2	3.90	19	37.30	0.479
	3 times / day	30	58.80	2	3.90	32	62.70	
	Total	47	92.20	4	7.80	51	100	

Table 4. above shows that the results of the square test (X²) or (Chi-Square Test) between body mass index (BMI), blood pressure, LDL Cholesterol, HDL Cholesterol, blood sugar, smoking behavior, food intake, diet, and eating frequency, as a cardiovascular risk factor with the Simple Nutrition Screening Tool (SNST), using a significance level of α 0.05 results obtained $p > 0.05$. This shows that there is no significant relationship between SNST and eating frequency as a cardiovascular risk factor. And the results of measurements using the Simple Nutrition Screening Tool (SNST) obtained results of 92.20% no risk of malnutrition and 7.80% risk of malnutrition.

DISCUSSION

This study showed that no significant relationship between SNST with BMI, blood pressure, LDL Cholesterol, HDL Cholesterol, blood sugar, smoking behavior, food intake, diet, and eating frequency as a cardiovascular risk factor. The SNST results differentiate between respondents who are not at risk of malnutrition and malnutrition.¹⁰ Malnutrition is a state of deficiency, excess, or imbalance of protein, energy, and other nutrients that can interfere with body functions and can lead to obesity, protein-energy malnutrition, vitamin and mineral deficiencies. SNST is a validated nutritional screening tool in determining the risk of malnutrition in hospital patients with a sensitivity value of 97% and a specificity value of 80% based on the Subjective Global Assessment (SGA) gold standard.^{10,11} The SNST research has been tested for validity and reliability. One of the studies conducted on adult patients concluded that SNST has good validity (sensitivity 91.28%, specificity 79.78%, NPV 92.1%, and PPV 78%).¹²

The result of SNST measurement was not significantly associated with BMI as a risk of cardiovascular disease because SNST was more sensitive in determining the risk of malnutrition as measured by anthropometry. Specifically, the relationship with BMI SNST is sensitive to measure malnutrition with underweight nutritional status based on BMI. In the study of respondents who suffered from

malnutrition, only one person (2%) of underweight nutritional status based on BMI caused the statistical test results to be non-statistical. The risk of CHD will increase if bodyweight starts to exceed 20% of ideal body weight. Obesity will increase blood volume by around 10-30%.^{10,13}

Obesity is often found together with hypertension, DM, and hypertriglyceridemia cases.¹²⁻¹⁴ In addition, obesity can increase total cholesterol and LDL cholesterol levels. The risk of CHD can increase if bodyweight starts to exceed 20% of ideal body weight. As a result, obesity will increase in blood volume by about 10-30%.^{15,16} This becomes an additional burden on the heart so that the heart muscle will experience structural changes in hypertrophy or hyperplasia, both of which can lead to heart pump disorders or are commonly referred to as heart failure or weak heart. In the case of heart failure, sufferers will feel tired, shortness of breath when doing light, moderate, or severe activities (depending on the degree of the weak heart).^{17,18}

SNST is also closely related to blood pressure as a cardiovascular risk factor (Table 1). Cardiovascular disease or cardiovascular disease (CVD) is a disease that is related to the heart and blood vessels. Cardiovascular disease due to atherosclerosis of blood vessel walls and thrombosis are the main causes of death in the world. The occurrence of CHD in hypertension is often found and is directly related to high systolic blood pressure. Normal blood pressure is major health support in life. The study results also reported high LDL cholesterol levels in malnourished respondents, as much as 5.90%. High LDL cholesterol will cause atherogenesis to occur quickly, which results in higher risk factors for suffering from cardiovascular disease.¹⁹⁻²¹

As many as 54.90% of respondents reported having smoking behavior. Smoking is one of the main risk factors for CHD besides hypertension and hypercholesterolemia. People who smoke more than 20 cigarettes per day can influence or strengthen the effects of two other major risk factors. Sudden death due to CHD in

male smokers is ten times greater than non-smokers and in women smokers four times greater than non-smokers. Cigarettes can cause 25% of CHD deaths in men and women under 65 years of age or 80% of CHD deaths in men under 45 years.^{22,23}

Cigarettes can reduce HDL cholesterol levels. The greater number of cigarettes smoked, the HDL cholesterol level decreases. In female smokers, the reduction in HDL cholesterol levels is greater than in male smokers. Smoking can also increase type IV hyperlipidemia and hypertriglyceridemia, abnormal platelet formation in diabetes mellitus accompanied by obesity and hypertension so that smokers tend to be atherosclerosis more easily than non-smokers.²³⁻²⁵

As many as 21.60% of respondents suffer from diabetes. Diabetes mellitus (DM) is proven to be a strong risk factor for all atherosclerotic diseases. Mortality and morbidity of CHD in patients with DM 2-3 times 23 times compared with non-DM. 75-80% of adult DM sufferers will die from CHD complications.^{24,26,27}

CONCLUSION

The conclusion shows that there is no relationship between Simple Nutrition Screening Tool (SNST) with body mass BMI, blood pressure, LDL cholesterol, HDL cholesterol, blood sugar, smoking behavior, food intake, diet, and frequency of eating as cardiovascular risk factors in elderly.

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