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Relationship Between Food Service Satisfaction and Macronutrient Intake With Nutritional Status of Patients at DKT TK IV 02.07.04 Hospital Bandar Lampung

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Abstract

Malnutrition affects 13-69% of people receiving care in hospitals worldwide. Anthropometric examinations reveal that 50% of patients in hospitals suffer from malnutrition. Patient psychology during the healing process is affected by a number of factors, including the patient's level of satisfaction with the hospital food service. The purpose of this study was to determine how the nutritional health of patients at DKT Hospital Bandar Lampung is related to satisfaction with food service and macronutrient consumption. This study uses a cross-sectional strategy as a design or analytical observational research plan. The sample used in this study was 47 respondents selected using the simple random sampling method. The bivariate test used in this study is the Chi-Square test. The results showed that there was a relationship between food service satisfaction and patient nutritional status (p-value = 0.013) and there was a relationship between macronutrient intake and patient nutritional status (energy = 0.023, protein = 0.035, fat = 0.021, carbohydrates = 0.045). Based on the results of the study, it can be concluded that there is a significant relationship between food service satisfaction and macronutrient intake with the nutritional status of patients at DKT TK IV hospital 02.07.04 Bandar Lampung.

Keywords: Food Service Satisfaction, Macronutrient Consumption, Nutritional Status

INTRODUCTION

There are several categories of medical services in hospitals, including the provision of nutrition services. Improving hospital service standards is the goal of the hospital nutrition service program by providing effective nutrition services that are integrated with other health services. Research and development, as well as inpatient and outpatient nutrition care, are all included in hospital nutrition services (Nafi'a, 2021). Subagio (2017) states that, based on research, the prevalence of malnutrition in hospitals around the world is very high. According to several studies, malnutrition affects 13-69% of people receiving care in hospitals worldwide. Anthropometric examinations reveal that 50% of patients in hospitals suffer from malnutrition. According to Rahmadhani (2016), 56.9% of hospital patients in Indonesia suffer from malnutrition, with hypermetabolism and low nutrient intake as a result of the patient's illness. One way to overcome malnutrition in patients is to provide proper nutritional care. Patient psychology during the healing process is influenced by a number of factors, including the level of patient satisfaction with hospital food services (Indrayani et al., 2023). Hospital food is prepared to help patients recover while meeting their nutritional needs. Patients' food intake and nutritional state are affected by their level of satisfaction with hospital food services. If patients do not consume hospital food, they are at risk of malnutrition (Alma, 2020). Assessment of food quality can affect patients' nutritional intake, so it can be used as a measure of how satisfied patients are with the food provided by the hospital. Sholeha (2020) states that the appearance and taste of food are two factors that can determine food quality.

The food provided must be of good quality if it tastes good, looks attractive, and makes patients feel satisfied so they want to finish the food. The results of a pre-survey of 15 patients at DKT hospital in Bandar Lampung on 02.07.04 showed that 7 patients were undernourished (46%), 5 patients were normal nutrition (33%), 2 patients were overnourished (13%) and 1 patient was obese (6%). The results of interviews with patients with undernutrition status showed that some of them rarely consumed food regularly, and some other patients stated that they had no appetite due to their illness. The purpose of this study was to determine the relationship between the nutritional condition of patients at DKT TK IV Hospital 02.07.04 Bandar Lampung with patient satisfaction with food service and macronutrient consumption, so that the information obtained can be used to improve hospital nutrition service standards, especially food provision. This study used an analytic observational research approach with a cross-sectional format.

RESEARCH METHODS

This study used a cross-sectional strategy as an analytic observational research design or plan. The study began with a pre-survey phase in April and lasted from May 27 to June 15, 2024. This study included all patients admitted to DKT Hospital Bandar Lampung, with a sample size of 47 respondents. This study used a cross-sectional strategy as an analytic observational research design or plan. The study began with a pre-survey phase in April and lasted from May 27 to June 15, 2024. This study included all patients admitted to DKT Hospital Bandar Lampung, with a sample size of 47 respondents. The inclusion criteria for this study were all patients who were hospitalized in classes I, II and III; patients who were given a regular or soft diet; patients can stand so that they can be weighed; patients aged 17-65 years; can communicate; good consciousness; willing to become respondents. Exclusion criteria are patients who are not willing to become respondents. The data in this study consisted of primary data and secondary data. Primary data consisted of patient identity information; weight and height information; 2x24 hour food recall information; patient satisfaction degree information. The secondary data consisted of an overview of the DKT Bandar Lampung hospital; information on inpatients at the DKT Bandar Lampung hospital; data on patients who were given a regular food diet. Each variable characteristic was described using univariate analysis. The study data were described using frequency distribution measures. Associations between nutritional condition, macronutrient consumption, and food service satisfaction were tested using the Chi Square test. Fisher's test, an alternative to the 2x2 table Chi Square test, was the hypothesis used in this study. Secondly, the BxK table hypothesis was used in this test, which could not be tested using chi square because it did not meet the test conditions.

RESEARCH RESULTS AND DISCUSSION

Univariate Analysis

Table 1. Frequency Distribution of Variables

Variable	n	%
Respondent's Age		
Late adolescence (17-25 years old)	8	17.0%
Early adulthood (26-35 years old)	15	31.9%
Late adults (36-45 years old)	9	19.1%
Early elderly (46-55 years old)	15	31.9%
Gender		
Male	21	44.7%
Female	26	55.3%

Food Service Satisfaction Level		
Not Satisfied	10	21.3%
Satisfied	34	72.3%
Very Satisfied	3	6.4%
Energy		
Deficit <80%	7	14.9%
Good 80%-112%	36	76.6%
More >112%	4	8.5%
Protein		
Deficit <80%	9	19.1%
Good 80%-112%	35	74.5%
More >112%	3	6.4%
Fat		
Deficit <80%	11	23.4%
Good 80%-112%	32	68.1%
More >112%	4	8.5%
Carbohydrates		
Deficit <80%	14	29.8%
Good 80%-112%	31	66.0%
More >112%	2	4.3%
Nutrition Status		
Skinny	2	4.3%
Good	38	80.9%
Fat	7	14.9%

Table 1 shows the results of the frequency distribution of respondents, the results showed that 47 patients hospitalized at DKT Bandar Lampung Hospital who became the research sample were aged between 18 and 55 years. With 15 respondents (31.9%), early adulthood and early old age were the largest age groups of research participants. A description of the gender distribution of inpatients at DKT Bandar Lampung Hospital who became the sample of this study was obtained from the research results. A total of 21 participants (44.7%) with male gender and 26 participants (55.3%) with female gender. Data on the distribution of the level of patient satisfaction with the food service at DKT Hospital Bandar Lampung which became the research sample were collected based on the results of the study. Based on the data collected, it is known that towards food services at DKT Hospital Bandar Lampung, as many as 10 people (21.3%) stated that they were not satisfied, as many as 34 patients (72.3%) stated that they were happy, and as many as 3 patients (6.4%) stated that they were very satisfied. Information regarding the distribution of macronutrient consumption of patients at DKT Bandar Lampung Hospital who were respondents in this study was obtained based on the results of the study. Based on statistics, energy consumption was found to be in the low group at 14.9%, protein at 19.1%, fat at 23.4%, and carbohydrates at 29.8%. Energy is 76.6%, protein is 74.5%, fat is 68.1%, and carbohydrates are 66.0% so that it falls into the very good category. As for the high nutrient group, energy (8.5%), protein (6.4%), fat (8.5%), and carbohydrates (4.3%). Data on the nutritional status of patients at DKT Hospital Bandar Lampung who became the research sample were collected based on the results of the study. Based on the data collected, there were 2 patients (4.3%) who were undernourished, 38 patients (80.9%) were normal, and 7 patients (14.9%) were overnourished.

Bivariate Analysis

Table 2. Chi-Square Test Result

Variable dependent	Category	Nutrition Status				p-value	Amount
		Good nutrition		Poor nutrition			
		n	%	n	%		
Food Service Satisfaction	Not satisfied	5	8.1	5	1.9	0.013	47
	Satisfied	33	29.9	4	7.1		
Energy Intake	Good intake	32	29.1	4	6.9	0.023	47
	Poor intake	6	8.9	5	2.1		
Protein Intake	Good intake	31	28.3	4	6.7	0.035	47
	Poor intake	7	9.7	5	2.3		
Fat Intake	Good intake	29	25.9	3	6.1	0.021	47
	Poor intake	9	12.1	6	2.9		
Carbohydrate Intake	Good intake	28	25.1	3	5.9	0.045	47
	Poor intake	10	12.9	6	3.1		

Table 2 shows the results of the association test between food service satisfaction and macronutrient intake with the nutritional status of patients in the hospital. A p value of 0.013 was found for the association between food service satisfaction and nutritional status based on the findings of Fisher's test for exact significance (2 sided). Given that the p value for this value is <0.05, it can be concluded that there is an association between patients' nutritional condition and food service satisfaction, with Ha accepted and H0 rejected. A p value of 0.023 was found for the association between energy consumption and nutritional condition based on Fisher's exact test for significance (2 sided). As the p value for this value is less than 0.05, it can be concluded that there is an association between the patient's nutritional condition and energy intake, with Ha accepted and H0 rejected. A p value of 0.035 was found for the association between protein consumption and nutritional status based on Fisher's test findings for exact significance (2 sided). The p value of this value is less than 0.05, which indicates that the alternative hypothesis is accepted. This indicates that there is a relationship between the nutritional status of patients and their protein intake. A p value of 0.021 was found for the association between fat consumption and nutritional status based on Fisher's exact test findings for significance (2 sided). As the p value for this value is <0.05, it can be concluded that there is an association between the patient's nutritional condition and fat consumption, with Ha accepted and H0 rejected. A p value of 0.045 was found for the association between carbohydrate consumption and nutritional status based on Fisher's test findings for exact significance (2 sided). It can be concluded that there is a relationship between the nutritional condition of patients and their carbohydrate consumption as this value shows a p value of less than 0.05, indicating that the alternative hypothesis is accepted.

Discussion

Characteristics of Respondents

The participants in this study were patients who were hospitalized in classes I, II and III at DKT Bandar Lampung hospital. The characteristics of the patients studied consisted of age and gender. It can be seen from the results of the study that the age of the 47 hospitalized patients at DKT Bandar Lampung hospital who were sampled in this study had an age between 18 years and 55 years. The age of many participants in this study was early adulthood with 15 people (31.9%) and early elderly age with 15 people (31.9%). The majority of respondents in the study were female with 26 participants (55.3%). Early adulthood is a crucial age in a person's development, where behavioral changes can occur. During this period, it is very important to pay attention to nutritional needs, especially macronutrient

needs. macronutrient intake in excess of needs will lead to overeating, which leads to obesity and is prone to non-communicable diseases including stroke, diabetes mellitus, high blood pressure, and heart disease (Mawitjere et al., 2021). Apart from early adulthood, the elderly also need to pay attention to their nutritional needs. Generally, in the elderly there is a decrease in the physiological function of the oral cavity, which of course will affect the process of chewing food, and also the appetite. Since elderly people usually have a lower appetite, their nutritional condition is considered below normal. It is very important to meet the dietary needs of the elderly to prevent disease and damage due to aging and maintain muscle development, activity, and body function (Nurqisthy et al., 2016). The amount of food consumed varies according to gender. Women's nutritional needs are lower than men's. However, at DKT Hospital Bandar Lampung, the nutritional adequacy standards of patients have been set, no longer differentiating by gender in the quantity of macronutrient requirements.

Frequency Distribution of Food Service Satisfaction

Indicators in assessing food service satisfaction can be seen through the food service provided. One important benchmark in evaluating patient satisfaction is a key factor in the effectiveness of hospital food services. This level of satisfaction has the potential to affect the amount of nutrients consumed by patients, which in turn can affect how well they are nourished (Ronitawati et al., 2021). According to (Rahmadhani, 2016) Serving food that meets nutritional and health requirements, including those related to the quality, taste, and appearance of food, is one way that can be applied by medical institutions in helping hospitalized patients to avoid malnutrition. Patient satisfaction with food service will be affected by the application of these criteria, which will also have an indirect impact on food consumption and nutritional status. Based on the results of the study shown in table 4.4, it can be seen that 34 patients (72.3%) were satisfied and 3 patients (6.4%) were very satisfied. This data shows that the food service provided by the hospital is quite good. Food quality is among the factors that influence inpatient satisfaction and can be evaluated from a number of perspectives. Patient satisfaction with nutrition services is negatively affected by poor food quality, and vice versa. Based on research, some aspects of hospital food service satisfaction such as food taste and incomplete tableware are considered less desirable by patients, contributing to patient dissatisfaction. However, as satisfaction is a subjective measure, each patient will judge based on their personal preferences. When it comes to food service, quality is strongly influenced by variety, flavor, consistency, and type of food. The quality of food has a very significant impact on patients over the period of time it is provided. Good quality care has a positive impact on patients' well-being and can improve their health conditions during their hospitalization. Patient satisfaction is one of the most effective strategies in improving the quality of care in patient rooms. The more stable it is, the more reliable the quality of service and food provided (Nafi'a, 2021).

Frequency Distribution of Macronutrient Intake

Based on the results of the 2x24 hour recall, it is known that the majority of patients' macronutrient intake such as energy as many as 36 patients (76.6%), protein as many as 35 patients (74.5%), fat as many as 32 patients (68.1%) and carbohydrates as many as 31 patients (66.0%) in the good category. This shows that the nutritional needs of patients during hospitalization are sufficient. The nutrisurvey program is used to calculate nutrient intake, including calories, protein, fat, and carbohydrates. A patient's food intake can be affected by several circumstances. This also involves a decrease in appetite, which in turn

impacts the patient's food consumption. The nutritional intake of certain patients was classified as inadequate during the clinical trial as they did not consume all the food given to them, including rice and animal side dishes. According to Semedi (2013), if the consumption of nutrients and energy is not commensurate with the needs for a long time, nutritional status will change. The nutritional condition of patients is influenced by the nutrients they consume while in hospital. Compared to patients with low nutrient consumption, those with adequate nutrient intake will be healthier after discharge. According to Nurqisthy (2016) Evaluation of food quality, which is one of the ways patients express their satisfaction with the food provided in the hospital, can have an impact on patients' need for protein and calories. Among the important factors that must be considered to accelerate the recovery of patients is their need for protein and energy. A patient's diet must meet their nutrient needs in terms of both quantity and quality. The nutritional needs that are most considered when determining food intake are the needs for energy and protein, because meeting these needs will also meet other needs. Compared to patients in the deficient category, the majority of patients in the good category in this study had a higher level of nutritional adequacy. This proves that the majority of patients find hospital cuisine satisfactory.

Frequency Distribution of Nutritional Status of Patients

According to Harjatmo (2017), a person's nutritional status is determined by how well their body meets its nutritional needs and how well they absorb nutrients from food. A person's nutritional needs and consumption determine their current nutritional status. A balanced relationship between the body's nutritional needs and consumption will result in optimal nutritional status. The majority of inpatients at DKT Hospital Bandar Lampung, totaling 38 people (80.9%), were found to have a good (normal) nutritional condition based on the research findings. In this study, body mass index (BMI) was used to calculate nutritional conditions. Body mass index for adults and adolescents is calculated by dividing height (in meters) by weight (in kilograms). According to Noviyanti (2021) Nutritional problems can occur due to incorrect eating habits, including malnutrition and excess nutrition. A person's nutritional condition is influenced by their food consumption while in the hospital. After leaving the hospital, patients with adequate nutrient consumption have normal nutritional conditions. According to Sundari (2022) An important consideration in the overall hospital care management process is the nutritional health of hospitalized patients. Malnutrition can result from inadequate nutrition and increase morbidity and mortality rates. Malnutrition occurs when the body's minimal energy requirements are not met over a long period of time. The hallmark of this condition is weight loss.

Relationship between food service satisfaction and nutritional status of patients in hospitals

Table 2 illustrates the correlation between the nutritional condition of patients and the level of patient satisfaction with food service at DKT Hospital Bandar Lampung. Of the 47 patients, 33 patients who expressed satisfaction had good nutritional status. The relationship between food service satisfaction and nutritional status was shown to have a value of 0.013 (p-value <0.05) based on the findings of statistical tests using the Fisher test, an alternative chi square test. This proves that there is a relationship between patients' nutritional condition and food service satisfaction. This finding is consistent with the findings of Semedi (2013) who found a p value of 0.007 for the association between improvement in patients' nutritional status and satisfaction with food service. According to Semedi (2013), patients' protein and calorie consumption increases in proportion to their level of satisfaction with hospital food

services, which reduces the rate of deterioration in patients' nutritional status. This finding is in line with the findings of Nurqisthy (2016) who showed a correlation between food service satisfaction and the level of calorie and protein adequacy, as indicated by p-values of 0.017 and 0.031. If patients are happy with the food provided by the hospital, their energy and protein needs will often be met while maintaining normal nutritional status. According to research by Rumaropen (2014), patients' energy and protein adequacy levels, as well as satisfaction with food services are significantly correlated. Patients are more likely to experience problems, inadequate care, and longer hospital stays if they are undernourished and protein deficient. On the other hand, patients' calorie and protein consumption will increase if they are highly satisfied with the care they receive. Rahmadhani (2016) states that patients' nutritional status, BMI, and nutrient consumption will be affected if they are satisfied with the food service. In theory, high food consumption and little food wastage are influenced by patients' satisfaction with hospital diet food. The research findings suggest that the effectiveness of hospital food services can be evaluated by asking patients to rate their level of enjoyment and liking of the food. The findings of this study support the idea that patients' food consumption is significantly influenced by their satisfaction with the food provided in the hospital. Low food wastage and increased food intake are associated with inpatients' satisfaction with their meal service. A number of factors measure patient satisfaction with hospital dining services, including menu variety, food presentation, timeliness of service, property conditions, hygiene standards, and the attitude and behavior of serving staff. The number of dishes left over indicates how well the meal was received by the diners. Hospital nutrition services have been implemented when patients are able to finish the food provided Nafi'a (2021).

Relationship Between Macronutrient Intake And Nutritional Status Of Patients In Hospitals

The results of the relationship between energy intake and nutritional status were obtained based on statistical tests using Fisher's test, the alternative chi square test. The p value of 0.023 ($p < 0.05$) proves that there is a significant relationship between energy consumption and nutritional condition, thus rejecting H0 and accepting Ha. Of the 47 participants surveyed, 36 participants had very good energy intake, which was between 80% and 112% of needs, 32 participants had good (normal) nutritional conditions, and 4 participants had poor nutritional conditions (one participant was underweight and three respondents were obese). 6 participants had high (normal) nutrition, and 5 participants had poor nutrition (one lean and four obese), out of 11 participants who had inadequate intake (both less and more than required). This study supports Sundari (2022)which shows a strong correlation between energy consumption and nutritional conditions in internal medicine patients, with a p value of 0.000 ($p <0.05$). Energy has a role that is necessary for the continuity of body functions including blood circulation, pulse, breathing, digestion, and other physiological processes, which explains the relationship between nutritional conditions and energy consumption. Nutritional status will be compromised due to inadequate energy intake that is higher than recommended. Malnutrition will result from long-term inadequate calorie intake, although malnutrition can also result from excessive energy consumption. Nutritional conditions change due to persistent low intake of energy and nutrients. A person's initial nutritional condition upon admission, the severity of the illness, gastrointestinal problems (nausea, bloating, lack of appetite), and inadequate nutrient absorption can cause a person's nutritional condition to deteriorate. A patient's nutritional condition can worsen over time, depending on the nutrients they consume during that time (Rahmadhani, 2016).

The relationship between protein consumption and nutritional condition was found to have a p value of 0.035 ($p < 0.05$), which proves that the alternative hypothesis is accepted, which proves that there is a significant relationship between protein consumption and nutritional condition. This result is based on statistical tests using Fisher's test, an alternative chi square test. Of the 47 respondents, 35 had adequate protein intake, which was between 80 and 112% of their needs; 31 participants had a good (normal) nutritional condition; and 4 participants had a poor nutritional condition (1 underweight and 3 obese). Of the 12 patients who consumed less than the required amount, 7 had normal nutritional status and 5 had poor nutritional status (1 lean and four obese). This study supports the findings of Darmawan (2019) research which found a strong relationship between protein intake and the nutritional condition of cancer patients who are undergoing chemotherapy, as indicated by a p value of 0.035 ($p < 0.05$). A person's nutritional condition can be influenced by adequate protein intake. Increased protein consumption greatly improves nutritional status. Protein deficiency over a long period of time can result in malnutrition, and inadequate protein consumption can affect body weight. The results of Saviria (2020) which revealed a significant relationship between protein consumption and the nutritional condition of lung cancer patients, with a p value of 0.011 ($p < 0.05$), are in accordance with the findings of this study. One of the reasons is that protein can heal injured tissues. Thus, the nutritional status of patients can be influenced by adequate protein consumption. Long-term improvement in nutritional status will result from higher protein consumption. The results of the relationship between fat intake and nutritional status were obtained based on the statistical test used, namely the Fisher test, which is an alternative chi square test. The p value of 0.021 ($p < 0.05$) indicates that there is a significant relationship between fat intake and nutritional status, thus rejecting H0 and accepting Ha. Of the 47 respondents surveyed, 32 participants had a good fat intake, which was between 80%-112% of the requirement, 29 participants had a good (normal) nutritional status, and 3 participants had an insufficient nutritional status (2 participants were underweight and 1 participant was overweight). Of the 15 respondents whose intake was less (less or more than needed), there were 9 respondents who had good nutritional conditions (normal), and 6 respondents who had poor nutritional conditions (6 respondents were obese).

This finding is in line with Darmawan (2019) findings which prove a significant relationship (p value 0.047, $p < 0.05$) between fat consumption and the nutritional condition of cancer patients who are undergoing chemotherapy. The body uses fat for energy and other purposes, so there is a relationship between the amount of fat consumed and nutritional health. In addition, fat serves to prolong satiety. Low intake can reduce changes in body mass and tissue as well as the amount of energy supplied to body cells as fat is the body's main source of energy. Despite the possibility of metabolic diseases and nutritional conditions. Based on statistical tests using Fisher's test, the alternative chi square test, it was found that there is a correlation between carbohydrate consumption and nutritional condition. The results showed a p value of 0.045 ($p < 0.05$) which means that the alternative hypothesis is accepted, indicating that there is a significant relationship between carbohydrate consumption and nutritional condition. Of the 47 respondents surveyed, 31 respondents had adequate carbohydrate consumption, which was between 80% and 112% of the requirement, 28 respondents had good (normal) nutritional conditions, and 3 respondents had poor nutritional conditions (2 respondents were thin and 1 respondent was fat). 10 participants had good nutrition (normal), and 6 participants had poor nutrition (6 participants were obese) out of 16 respondents whose intake was inadequate (less or more than the requirement). The results of Saviria (2020) which proved a significant relationship between

the nutritional condition of lung cancer patients and their carbohydrate consumption, with a p value of 0.008 ($p < 0.05$), are in accordance with the findings of this study. The amount of carbohydrates a person consumes is one of the factors that will affect their nutritional health. Carbohydrates are mostly needed to supply glucose, which the body uses to produce energy. Once absorbed, glucose is transferred to various parts of the body, such as the brain, kidneys, liver, skeletal muscles, red blood cells and adipose tissue. The process of glyconeolysis is how the body breaks down glycogen when it does not get enough glucose from food. Prolonged glyconeolysis will worsen nutritional status.

CONCLUSION

The majority of patients expressed satisfaction with the meal service they received. This is evidenced by the results of the study which showed that 34 patients (72.3%) stated that they were happy, 10 patients (21.3%) stated that they were dissatisfied, and 3 patients (6.4%) stated that they were very satisfied with the food service received at DKT Class IV Hospital 02.07.04 Bandar Lampung. Patients in DKT TK IV Hospital 02.07.04 Bandar Lampung mostly consume macronutrients which are included in the very good group. Based on the results of the study, most patients in DKT TK IV Hospital 02.07.04 Bandar Lampung have a high nutritional status, even as many as 38 patients (80.9%) have a good nutritional status.

The results of the Fisher exact test with a p value of 0.013 at DKT TK IV Hospital 02.07.04 Bandar Lampung indicate a strong correlation between the nutritional status of patients and food service satisfaction. Based on the results of the Fisher exact test, there is a significant correlation between the nutritional status of patients at DKT TK IV Hospital 02.07.04 Bandar Lampung with macronutrient intake. The p values for energy intake 0.023, protein intake 0.035, fat intake 0.021, and carbohydrate intake 0.045 respectively on the nutritional status of patients.

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