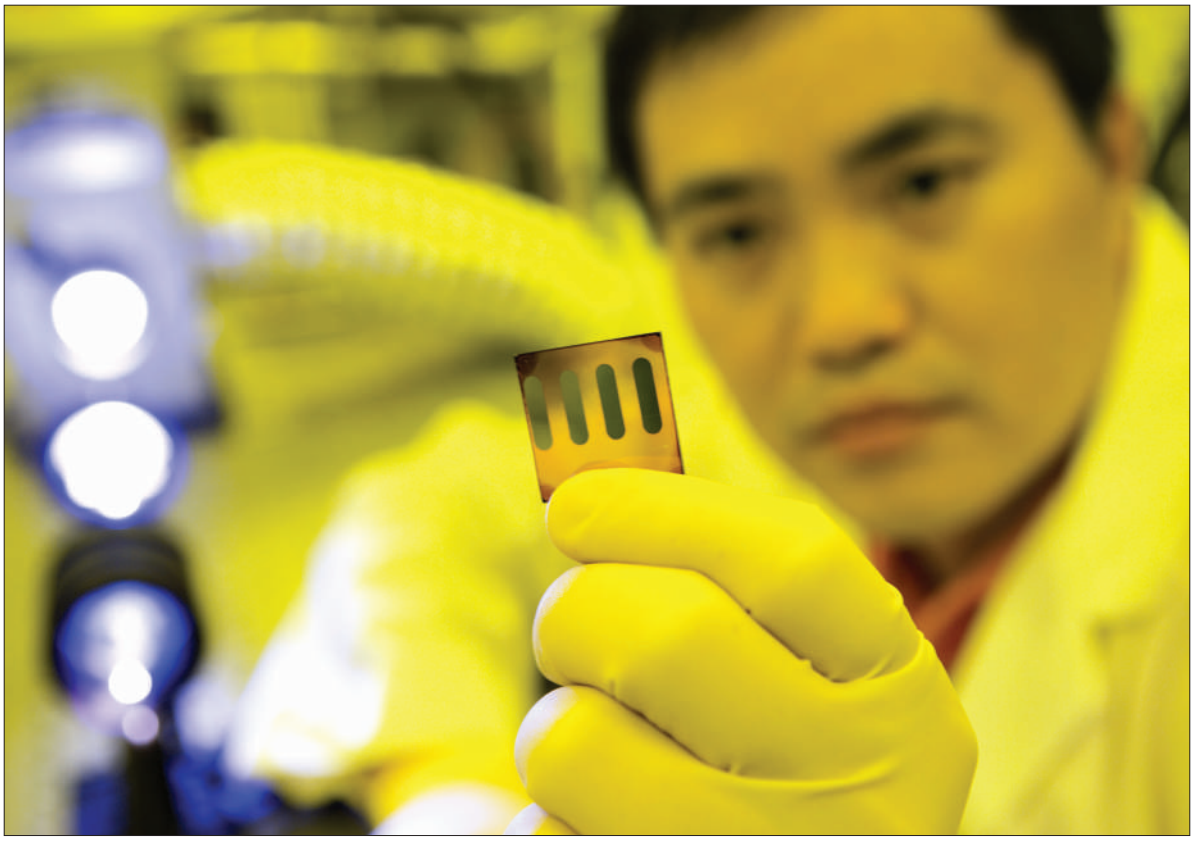

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Research Article
Provision of Catfish (*Clarias* sp.) Abon to Nutritional Status of Hemodialysis Patients Based on Subjective Global Assessment

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Abstract

Background and Objective: There was an increase in the incidence of patients undergoing hemodialysis therapy in Yogyakarta in 2013 as many as 1426 patients. Hemodialysis patients show signs of malnutrition, which can be identified based on subjective global assessment (SGA). They are recommended to consume high protein as a nutritional support, which can be fulfilled from catfish (*Clarias* sp.) and formed into abon (one kind of Indonesian food). The aim of this study was to determine the effect of catfish abon provision to nutritional status based on SGA of hemodialysis patients. **Materials and Methods:** The study was conducted at the Hemodialysis Unit of Panembahan Senopati Bantul Hospital. The research design was quasi-experimental with pre-post design. The sample size of 34 people was taken by purposive sampling. The independent variable of this study was the provision of catfish abon, while the dependent variable was nutritional status based on SGA. Data were analyzed univariate and bivariate by McNemar test. **Results:** In the pre-intervention condition, most respondents had good nutritional status based on SGA (SGA A category) as many as 30 people (88.2%), while in the post-intervention, all (100%) respondents became of good nutritional status (SGA A category). McNemar test results of the influence of catfish floss on nutritional status based on SGA showed p-value = 0.000 ($p<0.05$). **Conclusion:** The provision of catfish abon significantly affects the nutritional status of hemodialysis patients based on SGA.

Key words: Catfish (*Clarias* sp.) Abon, nutritional support, hemodialysis patients, subjective global assessment (SGA)

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Competing Interest: The authors have declared that no competing interest exists.

Data Availability: All relevant data are within the paper and its supporting information files.

INTRODUCTION

The number of hemodialysis patients is increasing, with an increase in the incidence of chronic kidney disease. The United State Renal Data System (USRDS) states that in 2015, more than 660,000 Americans were treated for kidney failure, also called end stage renal disease (ESRD)[1]. The World Health Organization says more than 500 million people experience chronic kidney failure and about 1.5 million residents undergo hemodialysis therapy throughout their lives[2]. The prevalence of chronic kidney failure in Indonesia is around[3] 0.2%.

Indonesian Renal Registry (IRR) shows an increased incidence of patients undergoing hemodialysis therapy in Yogyakarta in 2013 as many as 1426 patients[4]. Factors affecting the quality of life of patients include age, education, gender, occupation, nutritional status. In patients with chronic renal failure undergoing hemodialysis showing signs of malnutrition, which can be influenced by the disease or its own dialysis actions, such as anorexia, uremia and diseases that arise[5].

One way to assess the nutritional status of hemodialysis patients is using subjective global assessment (SGA). The SGA technique is more comprehensive than anthropometry because it consists of two stages and uses a structured clinical approach, namely anamnesa and physical examination that reflects metabolic and functional changes. Various studies suggest that the SGA technique has better sensitivity and specificity compared to anthropometry[6].

The healing process of patients who are undergoing hemodialysis is influenced by the patient's nutritional intake, especially protein intake. The need for protein for chronic kidney failure who receives hemodialysis treatment is higher than for patients with chronic kidney failure without hemodialysis. Patients with kidney failure with dialysis are recommended high protein intake to maintain nitrogen balance and replace amino acids lost during dialysis, which is 1-1.2 g kg^{-1} b.wt./day with 50% protein should be of high biological value because protein intake is very necessary considering its function in body[7], so nutritional support needs to be given, one of which is fulfilled from catfish formed into abon, so that it can be used to reduce cases of malnutrition in patients with chronic kidney disease undergoing hemodialysis.

Catfish (*Clarias* sp.) is a type of consumption fish that has been widely known. The high nutritional content, especially protein, smooth meat, regular thorns, can be served in a variety of low cholesterol preparations and low prices make it a favorite catfish among people from the lower, middle and upper classes[8].

Catfish has several benefits, that are catfish can be mixed with a variety of other medicinal ingredients to treat asthma, menstruation (menstruation) irregular, nose bleeding, blood urine and others and the advantages of catfish compared with other animal products is rich in leucine and lysine[9]. It is important to conduct research related to the use of local food including catfish as nutritional support. This study aimed to determine the effect of catfish abon provision to the nutritional status based on SGA of hemodialysis patients.

MATERIAL AND METHODS

The study was conducted at the Hemodialysis Unit of Panembahan Senopati Hospital Bantul. Data collection was carried out on February-May, 2017. The research design is a quasi-experimental design with pre-post design. The experiment in this study was giving catfish abon as much as 0.36 g kg^{-1} post-hemodialysis body weight/day, for 21 days.

This study involved 34 respondents who were taken by purposive sampling technique. The inclusion criteria of this study include routine hemodialysis patients 2 times/week, willing to be the subject of research and follow the research procedures, no catfish allergies. While the exclusion criteria are patients with anasarka udema and those who have complications of diabetes mellitus and disease malignancy.

The independent variable of this study is the provision of catfish abon, while the dependent variable is nutritional status based on SGA. Retrieval of nutritional status data using the subjective global assessment (SGA) form, through the interview process of respondents during the hemodialysis process. The collected data was then processed and analyzed univariately to see the frequency distribution of each variable and bivariate analysis to determine the effect of catfish abon on the nutritional status of hemodialysis patients based on SGA.

This study has obtained ethical clearance from the Health Research Ethics Commission of the Faculty of Health Sciences, University of Respati Yogyakarta, No: 330.4/FIKES/PL/II/2017 dated 15 February, 2017.

RESULTS

Characteristic of respondent in this study include age, sex, education and disease complications, shown in Table 1.

Table 2 showed that at the time of the pre-intervention, most of the respondents had good nutritional status based on SGA (SGA A category), namely as many as 30 people (88.2%). While respondents with moderate malnutrition

Table 1: Characteristics of the respondent

Characteristic of respondent	Categories	n = 34	Percentage
Age	17-25 years old	1	2.9
	26-35 years old	4	11.7
	36-45 years old	11	32.3
	46-55 years old	9	26.4
	56-65 years old	7	20.5
	≥65 years old	2	5.8
Gender	Male	15	44.1
	Female	19	55.8
Education	Primary school	13	38.2
	Junior high school	5	14.7
	Senior high school	14	41.1
	University	2	5.8
Complication of disease	With complication	19	55.8
	No complication	15	44.1

Table 2: Frequency distribution of respondents based on SGA

Variables	Categories	Number	Percentage
SGA Pre-intervention	SGA A	30	88.2
	SGA B	4	11.7
	SGA C	0	0.0
SGA Post-intervention	SGA A	34	100.0
	SGA B	0	0.0
	SGA C	0	0.0

(SGA B category) total 4 people (11.7%). In the post-intervention condition, all (100%) respondents were of good nutrition status (SGA A category). This can be seen from the SGA assessment component in the pre-intervention state, there are several patients in the category (3-5, mild-moderate) including changes in food intake, gastrointestinal, changes in body weight and edema (in one part of the body). Whereas in the post-intervention situation, assessment was more dominant in the category (6-7, very mild risk). There are several respondents with the results of the assessment in the category (3-5, mild-moderate) but not as many as in the pre-intervention situation. Thus affecting the final results of the SGA assessment.

There were no respondents with severe malnutrition (SGA C category), because respondents with anasarka udema that were part of the question component in SGA C were excluded from the study. In addition to the assessment of changes in body weight, food intake, gastrointestinal symptoms, functional capacity, subcutaneous fat loss, muscle thinning and edema the assessment results are always at (6-7 SGA A) and (3-5 SGA B).

The frequency distribution of respondents based on the nutritional status of the SGA in this study was spelled out according to each component of the SGA assessment, shown in Table 3. Table 4 showed that McNemar test results obtained a value of $p = 0.000$ ($p<0.05$), so that the provision of catfish abon significantly influence the nutritional status based on SGA.

DISCUSSION

Provision of catfish abon in this study, it is known that all respondents consumed 100% catfish abon given. This can be ensured by filling out the Food Record questionnaire that is collected every week and controlled by sending short message service (SMS) every day to respondents to remind respondents to consume catfish abon. Dietary monitoring using SMS has been shown to improve anthropometric nutritional status and albumin level of hemodialysis patients[10,11]. Knowledge and support from others are factors that can influence the dietary compliance of hemodialysis patients. If the knowledge and support for patients is greater, the patient's dietary compliance will also be greater[12].

One practical and simple alternative way to assess a patient's nutritional status is the subjective global assessment (SGA) which not only relies on a very limited objective measurement but also based on clinical measurements[13]. In the use of subjective global assessment (SGA) to assess nutritional status, the prevalence of malnutrition was found to be lower in the higher LFG of 20-28% in LFG 30-20 mL min^{-1} and as much as 40% was found in patients with end-stage kidney disease at the beginning of hemodialysis therapy[14]. The subjective global assessment (SGA) method is preferred to assess the nutritional status of chronic kidney disease patients with hemodialysis because it is fast, easy and inexpensive compared to other methods[15].

McNemar test results obtained $p = 0.000$ ($p<0.05$), so that there was a significant influence in nutritional support provision in the form catfish abon to nutritional status based on SGA of hemodialysis patients. Relative risk (RR) obtained a value of 1.133 meaning that after being given nutritional support of catfish abon, respondents have a 1.133-fold possibility for SGA A status compared to before being given nutritional support.

The SGA assessment component taken from PERNEFRI[14], which in this study was used to assess the respondent's nutritional status consisted of (changes in body weight, changes in food intake, gastrointestinal symptoms, functional capacity, subcutaneous fat loss, muscle thinning and edema). One component of the assessment is edema. In the event of edema occurs due to a buildup of fluid in the tissue, so that's an early sign of lack of protein.

The results of univariate analysis showed that at the time of pre-intervention, most respondents had good nutritional status based on SGA (SGA A category) as many as 30 people (88.2%). While respondents with moderate malnutrition (SGA B category) totaled 4 people (11.7%). This is influenced by the

Table 3: Frequency distribution of respondents based on the SGA assessment component

Component of SGA	Data retrieval time	Categories	Number	Percentage
Weight change	Pre-intervention	SGA A	30	88.2
		SGA B	4	11.7
		SGA C	0	0.0
	Post-intervention	SGA A	34	100.0
		SGA B	0	0.0
		SGA C	0	0.0
Changes in food intake	Pre-intervention	SGA A	30	88.2
		SGA B	4	11.7
		SGA C	0	0.0
	Post-intervention	SGA A	34	100.0
		SGA B	0	0.0
		SGA C	0	0.0
Gastrointestinal symptoms	Pre-intervention	SGA A	30	88.2
		SGA B	4	11.7
		SGA C	0	0.0
	Post-intervention	SGA A	34	100.0
		SGA B	0	0.0
		SGA C	0	0.0
Functional capacity	Pre-intervention	SGA A	34	100.0
		SGA B	0	0.0
		SGA C	0	0.0
	Post-intervention	SGA A	34	100.0
		SGA B	0	0.0
		SGA C	0	0.0
Subcutaneous fat loss	Pre-intervention	SGA A	34	100.0
		SGA B	0	0.0
		SGA C	0	0.0
	Post-intervention	SGA A	34	100.0
		SGA B	0	0.0
		SGA C	0	0.0
Muscle shrinking	Pre-intervention	SGA A	34	100.0
		SGA B	0	0.0
		SGA C	0	0.0
	Post-intervention	SGA A	34	100.0
		SGA B	0	0.0
		SGA C	0	0.0
Edema	Pre-intervention	SGA A	30	88.2
		SGA B	4	11.7
		SGA C	0	0.0
	Post-intervention	SGA A	34	100.0
		SGA B	0	0.0
		SGA C	0	0.0

Table 4: Results of bivariate analysis of giving catfish abon to nutritional status based on SGA using the McNemar test

	Nutritional status							
	SGA A		SGA B		Total			
Provision of catfish Abon	Number	Percentage	Number	Percentage	Number	Percentage	p-value	RR (95%)
Post-intervention	34	100.0	0	0.0	34	100	0.000	1.133
Pre-intervention	30	88.2	4	11.8	34	100		(1.002-1.281)
Total	64	94.1	4	5.9	68	100		

SGA assessment on components (changes in body weight, food intake, gastrointestinal symptoms and edema) that are in the category of moderate malnutrition. In the post-intervention condition, all (100%) respondents became of good nutritional status (SGA A category). This can be seen from the SGA assessment component in the pre-intervention state, there are several patients in the category (3-5, mild-moderate) including changes in food intake, gastrointestinal, changes in body weight and edema (in one part of the body). Whereas in the post-intervention situation, assessment was more dominant in the category (6-7, very mild risk).

There were no respondent with severe malnutrition (SGA C category), because respondent with anasarka udema that were part of the question component in SGA C were excluded from the study. In addition to the assessment of changes in body weight, food intake, gastrointestinal symptoms, functional capacity, subcutaneous fat loss, muscle thinning and edema the assessment results are always at (6-7 SGA A) and (3-5 SGA B).

Nutritional support is given in the form of catfish abon because catfish have high nutritional content, especially protein. Protein has the function of building and maintaining body cells and tissues, forming essential body bonds, regulating water balance, maintaining body neutrality which acts as an antibody formation, transporting nutrients and as a source of energy[16]. This balance is obtained through a complex system involving proteins and electrolytes[17].

Patients with kidney failure with hemodialysis are recommended high protein intake to maintain nitrogen balance and replace amino acids lost during dialysis, which is 1-1.2 g kg^{-1} b.wt./day with 50% protein should be of high biological value because protein intake is very necessary considering its function in body.[7]

This study found a positive effect of nutritional support provision by utilizing local food in Indonesia, namely catfish (*Clarias* sp.). This study helps researchers to uncover critical areas of the importance of nutritional support provision in efforts to improve the nutritional status of hemodialysis patients with the use of local food that cannot be explored by many researchers. Thus, a new theory is obtained about the benefits of nutritional support provision by using catfish to improve the nutritional status of hemodialysis patients based on Subjective Global Assessment.

CONCLUSION

The provision of catfish abon significantly influences the nutritional status of hemodialysis patients based on subjective global assessment (SGA). Further research needs to be done regarding the provision of nutritional support to hemodialysis patients, taking into account the factors that might influence the effect of providing nutritional support.

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