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THE EFFECT OF CHICKEN-BASED SIDE DISH RECIPE MODIFICATION ON PATIENTS' FOOD LEFTOVERS

Pengaruh Modifikasi Resep Lauk Hewani Ayam terhadap Sisa Makanan Pasien

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ABSTRAK

Upaya untuk memenuhi gizi pasien yaitu dengan penyelenggaraan makanan dengan standar makanan. Sisa makanan lauk hewani menu ayam belum memenuhi standar pelayanan minimal yaitu < 20%. Menu lauk hewani berbahan dasar ayam sering meninggalkan sisa makanan melebihi standar tersebut. Tujuan penelitian yaitu untuk mengetahui perbedaan sisa makanan pasien berdasarkan modifikasi resep lauk hewani ayam. Desain penelitian adalah cross-sectional, dilakukan selama 3 hari dengan total 30 pasien rawat inap yang dibagi ke dalam 3 kelompok menu (masing-masing 10 pasien), berdasarkan variasi resep lauk hewani ayam yang dimodifikasi. Pemilihan sampel menggunakan teknik total sampling. Analisis data menggunakan uji Kruskal-Wallis untuk mengetahui perbedaan sisa makanan antar kelompok resep. Hasil menunjukkan tidak terdapat perbedaan sisa makanan yang signifikan antar kelompok resep (p= 0,793). Meskipun tidak signifikan, hasil ini memberikan masukan bagi rumah sakit untuk mempertimbangkan variasi menu sebagai bagian dari upaya meningkatkan daya terima makanan pasien. Penelitian lanjutan dengan jumlah sampel lebih besar dan durasi pengamatan lebih panjang direkomendasikan untuk memperoleh hasil yang lebih kuat.

***Kata kunci**: ayam, modifikasi resep, pasien, rumah sakit, sisa makanan*

ABSTRACT

Efforts to meet patients' nutritional needs include food service management that adheres to hospital nutrition standards, one of which is limiting plate waste to below 20%. Chicken-based animal protein dishes often contribute to plate waste exceeding this standard. This study aimed to determine the differences in patients' plate waste based on modified chicken recipes. A cross-sectional design was employed, conducted over three days, involving 30 hospitalized patients divided into three groups (10 patients per group) based on the type of modified chicken dish served. Total sampling was used to select participants. The Kruskal-Wallis test was used to analyze differences in plate waste across the three recipe groups. The results showed no statistically significant difference in plate waste between the modified recipes (p= 0.793). Although the difference was not significant, the findings suggest that hospitals may still consider implementing recipe modifications to improve food acceptance and support patient recovery. Further studies with larger sample sizes and longer observation periods are recommended to validate these findings.

Keywords: chicken, hospitals, leftovers, patients, recipe modifications

INTRODUCTION

Nutrition services in hospitals are provided and tailored to the patient's condition based on their nutritional, clinical, and metabolic status. A patient's nutritional intake significantly impacts the healing process, while the course of the disease can also impact their nutritional intake.[1] Ineffective management of the disease will result in acute and even chronic complications.[2]

Food service is part of the nutritional services in hospitals, particularly in inpatient wards. Hospital food service is a series of activities, from establishing hospital food regulations and menu

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planning to determining the food consumed.[3]

One effort to meet patient nutritional needs is by providing food with food standards. Hospital patient food standards include food for those requiring special diets and those not requiring special diets, with several types of food, namely: regular food, soft food, strained food, and liquid food. In this case, food with these standards is expected to be well received by patients. It is also important to ensure that the food served can maintain its quality and can be evaluated by looking at patient acceptance.

Low levels of patient satisfaction result in patients not finishing their food, resulting in leftover food being served.[3] Acceptability is the patient's ability to finish the food served. Generally, food acceptability can be determined by observing leftovers and answers to questions related to the food consumed.

The impact of food leftovers due to patients not finishing the food served by the hospital results in wasted costs. A more significant impact of food leftovers on patients is inadequate nutrient intake, especially energy intake. Inadequate energy intake is a risk factor for malnutrition in hospitalized patients. Inadequate energy intake is at greater risk of malnutrition than patients with adequate energy intake. This malnutrition condition results in increased length of stay, clinical complications, hospital costs, and a poorer quality of life in patients.[4]

Research on animal side dish waste at Siti Aisyah Regional Hospital, Lubuklinggau City, in 2023 was still relatively high at 48.76%. This value remains a problem because it does not meet the minimum service standards of <20%. The results of research and development from Siti Aisyah Regional Hospital showed that the highest food leftovers occurred in the menu cycle on days 6, 7, and 8, namely chicken meatballs, chicken galantine, and chicken soup.[5]

Food leftovers is influenced by internal and external factors. Internal factors include clinical and pathophysiological conditions such as changes in appetite, taste changes, swallowing disorders, stress, and length of treatment. External factors include food quality, such as taste, aroma, portion size, texture, cleanliness of utensils, and menu variety.[6]The lack of menu variations in the Siti Aisyah Regional Hospital's menu cycle over the past year may also be a contributing factor to food leftovers. Modifying meals can improve patient satisfaction with the food served, thereby preventing food leftovers.[7]

Based on data on food leftovers from chicken side dishes at Siti Aisyah Regional Hospital, Lubuklinggau City, in 2023, which was 48.76%, this has an impact on increasing hospital costs and patient length of stay. Therefore, researchers are interested in seeing how the effect of modifying the chicken side dish recipe on patient food leftovers at Siti Aisyah Regional Hospital, Lubuklinggau City. The purpose of this study was to determine the effect of modifying the chicken side dish recipe on patient food leftovers at Siti Aisyah Regional Hospital.

METHODS

This cross-sectional study aimed to describe differences in patient food leftovers based on modified chicken side dish recipes. The study was conducted in two stages. The first stage was a recipe reformulation process based on previous food leftovers, not part of the intervention of this study. Three modified chicken recipes were used as the basis for dividing the menu groups: grilled chicken with Padang spices, chicken balls, and chicken with sweet and sour sauce. The second stage was the collection of patient food leftovers data based on the type of recipe received. The study was conducted in the inpatient wards of class I, II, and III of Siti Aisyah Regional Hospital, Lubuklinggau City, during March–April

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2024. Each recipe was served to 10 patients, with a total of 30 patients selected using the total sampling method. This study obtained informed consent from respondents who were willing to participate, as indicated by a consent form. All research procedures followed applicable ethical guidelines for research with human subjects. Ethical approval for the study was recommended by the Health Research Ethics Committee of the Ministry of Health, Palembang, with the ethical clearance number: 0772/KEPK/Adm2/IV/2024.

Respondents were divided into three menu groups (10 patients each), based on variations of modified chicken side dish recipes. Three types of modified chicken dishes were used in this study: grilled chicken with Padang spices, chicken balls, and chicken in sweet and sour sauce. Each product has a different processing method and ingredient composition, as explained below.

The first recipe, Grilled Chicken with Padang Spices, uses 200 g of chicken cooked with a ground spice mixture consisting of shallots (30 g), garlic (15 g), turmeric (2 g), ginger (3 g), and candlenuts (20 g). Turmeric leaves, bay leaves, lime leaves, and lemongrass are added as aromatic seasonings. All ingredients are simmered in 150 ml of coconut milk with 3 g of salt until the chicken is thoroughly cooked and the spices are well absorbed. The chicken is then grilled until golden brown. This recipe yields four servings of Padang-style grilled chicken.

The second recipe, Chicken Balls, is prepared from ground chicken (200 g) mixed with egg (55 g), cornstarch (30 g), garlic (15 g), ground pepper (2 g), salt (3 g), and sugar (3 g). The mixture is shaped into small balls, coated with breadcrumbs (100 g), and deep-fried in approximately 100 ml of hot oil until cooked and golden brown. This recipe produces eight servings of chicken balls.

The third recipe, Sweet and Sour Chicken, uses chicken fillet (300 g) coated with tapioca flour (30 g) and then fried. The sauce is made by sautéing garlic (15 g) and onions (25 g), then adding green beans (100 g), tomato sauce (40 g), oyster sauce (20 g), ground pepper (5 g), salt (5 g), and a small amount of cooking oil (30 g). After the sauce is cooked, the fried chicken is added along with sliced spring onions (30 g) and stirred until evenly mixed. This recipe yields six servings of sweet and sour chicken. The population of this study was inpatients in classes I, II, and III at Siti Aisyah Regional General Hospital, Lubuklinggau City. A total sampling method was used to select 30 patients. Inclusion criteria included male and female patients aged 18–65 years who were willing to participate and receive a modified menu. Exclusion criteria included patients discharged during observation, pregnant patients with hyperemesis, patients diagnosed with cancer, and patients with severe complications.

Primary data were obtained through observation and interviews, including respondent characteristics (age, gender, and disease diagnosis) and food leftovers data measured using a food weighing method. Secondary data included a general description of the Nutrition Installation and the number of inpatients receiving modified menus. The tools used included respondent identity forms, consent forms, recipe modification assessment forms, food leftovers forms, and digital scales.

Data analysis in this study was conducted using univariate and bivariate methods. Univariate analysis was used to describe the characteristics of respondents and the average value of food leftovers, including the mean, standard deviation, minimum, and maximum values, which are presented in tabular form. Prior to the bivariate test, a normality test using the Shapiro-Wilk was conducted to evaluate the distribution of food leftovers data. The test results showed that the data were not normally distributed. In addition, the

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results of the homogeneity of variance test also showed that the data did not have homogeneous variance. Based on these findings, the non-parametric Kruskal-Wallis test was used to determine whether there were significant differences in food leftovers between the three different chicken recipe menu groups.

RESULT

Table 1. Frequency Distribution of Respondent Characteristics (n = 30)

Respondent Characteristics	n	%
Gender		
Male	12	40.0
Female	18	60.0
Age		
18–41 years	18	60.0
42–65 years	12	40.0
Disease Diagnosis		
Hypokalemia	2	6.7
FAM (Fibroadenoma Mammae)	2	6.7
UTI (Urinary Tract Infection)	3	10.0
Clavicle Fracture (Right)	2	6.7
G1P0A0 + Anemia	1	3.3
Ganglion	1	3.3
P1A0 Post-Op SC	4	13.3
BPH (Benign Prostatic Hyperplasia)	2	6.7
STT Gluteus	2	6.7
Multiple Excoriated Wounds	1	3.3
Gout Arthritis	1	3.3
Decubitus Ulcer	1	3.3
Uterine Myoma	2	6.7
Ovarian Cyst	2	6.7
BPH + Gout Arthritis	1	3.3
Radius–Ulna Fracture	1	3.3
G1P0A0 18 Mg + Anemia	1	3.3
Gout Arthritis + Hyponatremia	1	3.3

Respondents in this study were inpatients of class I, II, and III who received a modified menu from the nutrition service at Siti Aisyah Regional General Hospital, with a total of 30 respondents divided into 3 menu groups (10 patients each). The results showed that the respondents were mostly female, namely 18 respondents (60%). Age (18 - 41 years) was 18 respondents (60%), and the diagnosis of post-op sectio caesarea disease was the most common compared to other disease diagnoses, namely 4 respondents (13.3%). The results of respondent characteristics based on gender, age, and disease diagnosis are presented in Table 1. The three modified dishes consist of grilled chicken with Padang spices, chicken balls, and chicken with sweet and sour sauce. The nutritional values of each dish are listed in Table 3, while the recipes before modification—meatballs with fiber, chicken galantine, and chicken soup—are listed in Table 2.

Table 2. Nutritional Value of the Menu Before Modifying the Chicken Side Dish Recipe

Menu	Energy (Kcal)	Protein (g)	Fat (g)	Carbohydrate (g)
Shredded Meatball (Bakso Serabut)	194.4	14.7	12.1	5.5
Chicken Galantine (Galantin Ayam)	173.7	14.7	10.1	4.1
Chicken Soup (Sop Ayam)	210.6	14.3	14.6	5.5

Table 2 presents the nutritional composition of three chicken-based side dishes before recipe modification: shredded meatballs (bakso serabut), chicken galantine, and chicken soup. All three dishes have relatively similar energy content, ranging from 173.7 to 210.6 kcal per serving. The highest protein content is found in shredded meatballs and chicken galantine (14.7 g each), while chicken soup contains slightly less protein at 14.3 g. The fat content is highest in chicken soup (14.6 g), followed by shredded meatballs (12.1 g), and the lowest in chicken galantine (10.1 g). Meanwhile, the carbohydrate content across all three dishes remains relatively low, ranging from 4.1 to 5.5 g. These findings serve as a basis for consideration in the recipe modification process aimed at enhancing food acceptability and achieving better nutritional balance in patient meals.

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Table 3. Nutritional Value of Modified Chicken Side Dish Recipe Menu

Menu	Energy (Kcal)	Protein (g)	Fat (g)	Carbohydrate (g)
Grilled Chicken with Padang Spices	224.9	16.5	13.8	10.0
Chicken Balls	232.0	8.2	15.6	4.8
Sweet and Sour Chicken Sauce	250.0	13.6	19.5	45.5

Table 3 presents the nutritional composition of three chicken side dishes based on modified recipes: grilled chicken with Padang spices, chicken balls, and sweet and sour chicken. These three dishes show an increase in the variety of macronutrients. Chicken with sweet and sour sauce has the highest energy content, at 250.0 kcal per serving, followed by chicken balls (232.0 kcal) and grilled chicken with Padang spices (224.9 kcal). The highest protein content is found in grilled chicken with Padang spices at 16.5 g, while chicken balls have the lowest protein content at 8.2 g. In terms of fat, chicken with sweet and sour sauce also has the highest content (19.5 g), followed by chicken balls (15.6 g), and grilled chicken with Padang spices (13.8 g). Meanwhile, the highest carbohydrate content is found in chicken with sweet and sour sauce at 45.5 g, which is much higher than the other two dishes.

Tables 2 and 3 show a comparison of the nutritional value of the chicken side dishes before and after the recipe modifications. Overall, there is an increase in energy value in the modified menu. The Padang-style grilled chicken contains 224.9 kcal, higher than the meatballs with strings, which only contain 194.4 kcal. Similarly, the sweet and sour chicken sauce contains the highest energy content at 250.0 kcal, compared to the chicken soup with 210.6 kcal. In terms of protein, the Padang-style grilled chicken shows an increase to 16.5 g from the previous 14.7 g in the meatballs with strings. However, the chicken balls experience a decrease in protein to 8.2 g compared to the chicken galantine (14.7 g). In terms of fat content, all three modified menus tend to have higher figures, especially the sweet and sour chicken sauce (19.5 g), which is much higher than the chicken soup (14.6 g). The highest carbohydrate content was also found in the sweet and sour chicken sauce, at 45.5 g, a significant increase compared to all pre-modified menus, which only ranged between 4.1 and 5.5 g. This indicates that the recipe modifications generally improve energy quality and macronutrient variety, although attention must be paid to nutrient balance.

Table 4 presents the distribution of patients' food leftovers after the modification of chicken-based side dish recipes. The results show that most patients (83.3%) left only a small amount of food (<20%), while a smaller proportion (16.7%) left a large amount of food (>20%). These findings indicate that the modified recipes were generally well accepted by patients, as reflected by the low percentage of food waste.

Table 4. Food Leftovers of Patients After Modification of Chicken-Based Side Dish Recipes

Category of Food Leftovers	Frequency (n)	Percentage (%)
Large (>20%)	5	16.7
Small (<20%)	25	83.3
Total	30	100

Although recipe modifications contribute to improved patient food acceptability, food leftovers levels are not solely influenced by the type and composition of the menu. Several internal factors, such as the patient's psychological state, including stress, anxiety, or low mood, can significantly reduce appetite. Furthermore, the patient's physical condition, such as post-operative pain, nausea, or medication side effects, can also affect

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the amount of food consumed. External factors include an unconducive dining environment, a meal schedule that doesn't align with the patient's rhythm, and the presentation of food.

The research data were then collected and tested for normality using the Shapiro-Wilk test and homogeneity using the Levene test. The results of the normality and homogeneity tests indicated that the data were not normally distributed ($p < 0.05$). Therefore, the analysis was continued using the Kruskal-Wallis test.

Table 5. Results of Data Normality Test with the Shapiwo-Wilk Test

Assessment Aspects	Menu	n	Mean Rank	p-value
Color	Grilled Chicken with Padang Spices	10	1.70	
	Chicken Balls	10	1.70	0.00
	Sweet and Sour Chicken Sauce	10	1.50	
Aroma	Grilled Chicken with Padang Spices	10	1.80	
	Chicken Balls	10	1.70	0.00
	Sweet and Sour Chicken Sauce	10	1.70	
Flavor	Grilled Chicken with Padang Spices	10	1.70	
	Chicken Balls	10	1.70	0.00
	Sweet and Sour Chicken Sauce	10	1.60	
Texture	Grilled Chicken with Padang Spices	10	1.70	
	Chicken Balls	10	1.70	0.00
	Sweet and Sour Chicken Sauce	10	1.60	
Serving Utensils	Grilled Chicken with Padang Spices	10	1.60	
	Chicken Balls	10	1.70	0.00
	Sweet and Sour Chicken Sauce	10	1.60	
Leftovers	Grilled Chicken with Padang Spices	10	1.80	
	Chicken Balls	10	1.90	0.00
	Sweet and Sour Chicken Sauce	10	1.80	

Based on the results of the Shapiro-Wilk normality test, all variables had a p-value > 0.05, thus concluding that the data were not normally distributed. Therefore, the non-parametric Kruskal-Wallis test was performed for further analysis.

Bivariate analysis in Table 6 using the Kruskal-Wallis test showed no significant differences in color, aroma, taste, texture, serving utensils, or leftovers among the modified chicken side dish menus ($p > 0.05$). The Padang-style grilled chicken and chicken balls generally received higher mean rank scores than the sweet and sour chicken. The distinctive aroma of the Padang-style grilled chicken is achieved by the spices and coconut milk, while some respondents found the texture of the sweet and sour chicken to be slightly harsh. The presentation of the chicken balls on a ceramic plate and garnish was considered more appealing. Some patients who had leftover food reported

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post-operative pain and decreased appetite.

Table 6. Results of the Kruskal-Walis Test of Respondents' Perceptions of Modified Chicken Side Dish Recipes

Assessment Aspects	Menu	n	Mean Rank	p-value
Color	Grilled Chicken with Padang Spices	10	16.5	
	Chicken Balls	10	16.5	0.574
	Sweet and Sour Chicken Sauce	10	13.5	
Aroma	Grilled Chicken with Padang Spices	10	16.5	
	Chicken Balls	10	15.0	0.848
	Sweet and Sour Chicken Sauce	10	15.0	
Flavor	Grilled Chicken with Padang Spices	10	16.0	
	Chicken Balls	10	16.0	0.865
	Sweet and Sour Chicken Sauce	10	14.5	
Texture	Grilled Chicken with Padang Spices	10	16.0	
	Chicken Balls	10	16.0	0.865
	Sweet and Sour Chicken Sauce	10	14.5	
Serving Utensils	Grilled Chicken with Padang Spices	10	15.0	
	Chicken Balls	10	16.5	0.870
	Sweet and Sour Chicken Sauce	10	15.0	
Leftovers	Grilled Chicken with Padang Spices	10	15.0	
	Chicken Balls	10	16.5	0.793
	Sweet and Sour Chicken Sauce	10	15.0	

DISCUSSION

1. Respondent Characteristics

Based on the results of research conducted at Siti Aisyah Regional Hospital, the majority of respondents were female, with 18 respondents (60%). Age (18-41 years) was 18 respondents (60%), and the most common diagnosis was post-cesarean section (CS) compared to other diagnoses, with 4 respondents (13.3%). In this study, the majority of the sample by gender was female. This is because respondents who met the inclusion criteria were non-diet patients, most of whom were obstetrics and gynecology patients.

Based on age, the highest prevalence is in the 18-41 age group. Increasing age affects physical, mental, and appetite changes. In adulthood, lifestyle changes, activity levels, and stress can influence individual food consumption.[8,9]. Frequently changing food consumption without considering your body's condition will affect your appetite.

Based on medical diagnoses, the majority of respondents were post-cesarean section (CS) patients. A person's physical condition significantly influences their food intake, as it is related to their appetite and mental state in the hospital.

2. Color

Food color plays a key role in the appearance of food. Attractive colors can enhance taste. This aligns with previous research showing that attractive color combinations can increase appetite, including a key role in

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appearance. With varied and natural-looking colors, a food's acceptability increases.

The results of the study showed that there was no difference in the perception of the color of chicken side dishes because patients considered the menu served to be in accordance with the name of the menu and looked attractive.[10]

3. Aroma

The aroma of food served can increase the appeal of consumption. Food aroma is the smell emitted by food, which has very strong sensory properties and can stimulate the sense of smell, thus stimulating appetite in patients based on respondent perception. The criteria for aroma assessment are whether it is fragrant or not.[11]

The research results showed that Padang-style grilled chicken had a more fragrant aroma due to the spices used and the use of coconut milk as its main ingredient. Furthermore, the aroma from the grilling process enhanced the dish's aroma.

4. Flavor

Food flavor is the most important component of taste because it has a dominant influence and involves the taste buds (tongue). According to previous studies, flavor can be determined by taste and oral stimulation. The texture and consistency of a food will influence the flavor produced by that food, and flavor plays a significant role in the quality of a food. Changes in texture or viscosity of a food can alter the resulting flavor by affecting stimulation of olfactory receptors and salivary glands.[12]

The use of spices is crucial because they enhance the flavor of food, thereby increasing appetite. Respondents who stated that the sweet and sour chicken sauce tasted unpleasant also expressed their dislike for the sweet and sour sauce served.

5. Texture

Texture is the structure of food as perceived in the mouth. Texture can influence the taste of a single ingredient or combination of ingredients. Texture encompasses the crispness, softness, and firmness of food as perceived by the taste buds.[13]. During an interview regarding texture, several respondents stated that the sweet and sour chicken sauce menu had a slightly hard texture because it was cold when served.

6. Serving Utensils

Presentation is the final appearance of food on cutlery such as plates or trays when served to patients. The results of the study showed that the most attractive serving utensils were on the chicken ball menu. The presentation of animal side dishes on the chicken ball menu partly used ceramic plates according to the class I patient inpatient class and used garnishes so that the presentation became more attractive. On the Padang spice grilled chicken and sweet and sour sauce chicken menus, the presentation used stainless steel trays for class II and III inpatient classes, but respondents stated that they were less attractive. Presentation on stainless steel trays was less attractive because the tray had 3 partitions, namely the presentation of staple foods, animal side dishes, vegetable side dishes, vegetables, and fruit mixed into one container.

Respondents stated that serving utensils were messy and that food was mixed with other foods when brought to the patient's room. The way a dish is served and the type of utensils used can influence a person's appetite. This research aligns with Rochmah's (2018) findings, which found that respondents considered food presentation attractive.[13]

7. Statistical Test Results of the Effect of Modifying Chicken Side Dish Recipes on Patient Food Remainder

The average percentage of small food leftovers (<20%) was 83.3%, while large food leftovers (>20%) was 16.7%. The statistical test results in this study showed no effect of modifying the

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chicken side dish recipe on patient food leftovers. This study differs from the study conducted at Mekar Sari Hospital (2019), which proved an effect of modifying the chicken side dish on patient food leftovers (p=0.013). However, that study was conducted with an experimental design and a control group, so the effects of the intervention could be observed more clearly. In contrast, this study used a cross-sectional design, which only describes conditions at one point in time without observing changes before and after the menu was provided.[14]

In another study by Widyanti and Rahmi (2024), it was found that menu modifications based on patient taste preferences and adaptation to local food culture significantly increased food consumption in inpatients with internal medicine at a regional general hospital in Yogyakarta (p<0.05). The study emphasized the importance of understanding local taste preferences, appropriate textures, and attractive visual presentation in increasing food acceptance.[15] Meanwhile, a recent study by Ryu et al. (2021) in Korea showed that adjusting flavors and reducing seasoning complexity in geriatric patients significantly increased food consumption and reduced food leftovers.[16]

Although statistical test results showed no significant effect between the modified chicken side dish recipe and patients' food leftovers (p = 0.793), descriptive results showed that most patients (83.3%) left small amounts of food (<20%). This discrepancy can be explained by several factors. First, the small sample size (n = 30) and the fact that the samples were divided into three groups may reduce the statistical power to detect significant differences between groups. Second, the possibility of a placebo effect or positive expectations regarding the newly modified food may also influence patients' subjective acceptance, without significant changes in actual consumption. Third, varying patient clinical conditions, such as postoperative pain, nausea, or limited mobility, may influence food consumption unevenly and indirectly related to the type of side dish provided. Furthermore, this discrepancy can be caused by various internal and external factors that need to be considered.

Internal factors include the patient's clinical and psychological condition, which directly affect their ability to consume. Several respondents in this study reported still experiencing post-operative pain, particularly on the first day of treatment, which impacted their appetite. Stress, anxiety, and negative emotional states during hospitalization have also been shown in various studies to contribute to reduced food intake due to disruptions in the regulation of hunger hormones like ghrelin and leptin.[17] In addition, physiological changes due to illness or medical procedures can affect the function of the senses of taste and smell, which in turn reduces the patient's appetite.[18]

Meanwhile, external factors include aspects of food quality and presentation, such as taste, aroma, texture, menu variety, serving temperature, and cleanliness of the food and serving utensils. Although the menu in this study had been modified nutritionally and taste-wise, several patients expressed a distaste for the tough texture of the chicken in sweet and sour sauce, which was served warm. This aligns with previous studies that found that food not served at optimal temperatures can significantly reduce food consumption.[19] Furthermore, respondents also cited the use of serving utensils, such as stainless steel trays with visually unappealing dividers, as a factor that reduces appetite. Other research suggests that unaesthetic and disorganized food presentation can reduce patient satisfaction and desire to eat.[20] Therefore, the interpretation of food leftovers results cannot be solely attributed to the recipe or menu modifications, but also requires

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consideration of the interaction between the patient's clinical condition, psychological perception, and the quality of the food served.

From the results of research conducted on class III inpatients at Dr. Soeratno Gemolong Regional General Hospital, Sragen Regency, it was shown that various factors influence patient satisfaction with hospital food, such as food quality, the influence of external food, the condition of the treatment environment, serving schedules, and food serving procedures.[21]

Overall, these internal and external factors contribute to the success of patient food consumption in hospitals. Therefore, in addition to considering recipe modifications, nutrition services must also consider the patient's physical and psychological condition and the quality of food presentation to improve food intake and accelerate the healing process.

CONCLUSION

Research shows that modifying a chicken side dish recipe did not significantly impact patient meal waste at Siti Aisyah Regional Hospital. Although the color, aroma, and taste of the food were deemed satisfactory, there were still complaints about the texture and presentation, which affected patient acceptance. Food leftovers levels are also influenced by internal factors such as post-operative conditions and appetite, as well as external factors such as the appearance of serving utensils, cleanliness, and temperature of the food when served. Therefore, recipe modification alone is not sufficient to improve patient food consumption without comprehensively addressing other aspects.

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