



Relationship of Food Service to Nutrition Installation with the Level of Satisfaction and Leftover Meals of Inpatients

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Abstract

Food service is one of the hospital nutrition services starting from menu planning to food distribution. Minimum Service Standards for food service include punctuality in providing food and food waste $\leq 20\%$. Based on the results of a survey conducted at La Temmamala Regional Hospital in 2024, the percentage of patient food waste was $<20\%$. This shows that the SPM of the nutrition installation has reached the target, but there are still efforts to maintain and improve. This study aims to examine the relationship between nutrition installation food service and the level of satisfaction and food waste of inpatients at the UPT La Temmamala Regional Hospital, Soppeng Regency. This study uses a quantitative approach with a cross-sectional study design with a sample of 55 inpatients at La Temmamala Regional Hospital. Sampling by purposive sampling was carried out in June 2025. Data were analyzed using the chi-square test. Hospital food service variables for indicators of waiter attitude, punctuality of food distribution and cleanliness of cutlery were rated as good by 55 respondents (100%) for indicators of food menu variety and patient satisfaction variables were rated as good by 54 respondents (98.2%) and less good by 1 respondent (1.8%). There is a relationship between hospital food service and patient satisfaction with a p value of 0.018 and there is no relationship between hospital food service and patient food waste with a p value of 0.291.

Introduction

Hospitals are one of the healthcare facilities most frequently accessed by the Indonesian people. Data from the 2023 Indonesian Health Survey (SKI) shows that approximately 7.2% of 315,646 Indonesians visited a hospital in the past year (Ministry of Health, 2023) In the 2018 National Health Survey (SUSENAS), the number of patients in Indonesia reached 68% of the total population, with around 32 out of 100 patients receiving inpatient care and 45%.

Inpatient care is the highest form of medical care offered to individuals or communities, involving hospital care and accommodation for a specific period of time (Bruch et al., 2026; Black et al., 2026; Geffen et al., 2025). This care adheres to established professional and service standards that are thoughtful, impactful, and productive (Bailey, 2025; Obeng et al., 2025; Modise, 2023). This can lead to both positive and negative experiences, depending on the patient's assessment. Inpatient care encompasses not only the treatment process but also the patient's basic needs, including the provision of food. Patient feeding falls under the category of medical support services, which are performed by the hospital's nutrition service (Herman1, 2022; Van Den Berg et al., 2023; Antasouras et al., 2023).

Food provision as one of the hospital's nutritional services is an activity ranging from menu planning to food distribution to consumers in order to achieve optimal health status through providing the right diet (Niken Ardana & Nirwana, 2024; Weinberg, 2023; Fatema, 2026) . One way to measure the effectiveness of nutrition services in hospitals can be seen from how well the hospital meets the dietary needs of patients, which can be seen from the minimum amount of food left over/uneaten. Food helps patients recover faster. When patients leave food uneaten, it will most likely impact their health and nutritional condition because the patient does not eat enough according to their needs (Ministry of Health of the Republic of Indonesia, 2008).

The reasons for patient food waste or poor acceptability are due to internal and external factors (Piere et al., 2026; Getyeza et al., 2026; Mahmoudifar et al., 2025). Internal factors include the patient's condition, including appetite and eating habits prior to hospital admission, and external factors include food taste, serving utensils, and presentation methods (Ambarwati et al., 2024; Istihat, 2026; Hutter et al., 2026).

A survey conducted at La Temmamala Regional Hospital in 2024 showed that the percentage of patient food waste was below 20%. This indicates that the SPM of the nutrition installation has reached the target. However, it is necessary to know the achievement of other indicators such as timeliness and things that can affect patient consumption levels, to maintain and, if possible, reduce the number of food waste. Therefore, it is necessary to study matters related to food service so that patients are satisfied with the food service of the nutrition installation and do not leave a lot of food waste (Meegoda et al., 2025; Manaf et al., 2026).

Based on this, the author intends to study the relationship between the nutritional installation food service and the level of satisfaction and food waste of inpatients at the La Temmamala Regional General Hospital, Soppeng Regency.

Methods

This study used a quantitative observational design with a cross sectional approach. The study was conducted in the inpatient wards of UPT RSUD La Temmamala, Soppeng Regency, in June 2025. The cross sectional design was used because the measurement of food service, patient satisfaction, and patient food waste was carried out at one point in time during the inpatient treatment period.

The population of this study consisted of all inpatients in the VIP, class 1, class 2, and class 3 wards of UPT RSUD La Temmamala, with a total population of 150 patients. The sample was selected using purposive sampling based on predetermined inclusion and exclusion criteria. The inclusion criteria were patients who were willing to participate as respondents, were able to communicate well, consumed food orally, and had received inpatient care for at least three days. The exclusion criteria were patients who could not communicate properly, patients who could not consume food orally, and patients who were unable to complete the study process. Based on these criteria, 55 inpatients were included as research respondents.

The independent variable in this study was hospital food service provided by the nutrition installation. Food service was assessed through four indicators, namely the attitude of food service staff, punctuality of food distribution, cleanliness of cutlery, and variety of food menus. The dependent variables were patient satisfaction and patient food waste. Patient satisfaction was measured based on patients' responses to the food service received during hospitalization, while food waste was measured based on the amount of food left by patients after meals.

Data were collected using questionnaires and food waste observation forms. The questionnaire was used to obtain respondent characteristics, including age, gender, and education, as well as patients' assessments of food service and satisfaction with the nutrition installation service.

Food waste data were collected by the researcher using the Comstock visual estimation method, which estimates the proportion of food remaining on the patient's plate after eating.

The collected data were processed through editing, coding, tabulation, and categorization. Respondent characteristics were analyzed descriptively. Food service, patient satisfaction, and food waste were categorized before statistical analysis. Univariate analysis was used to describe the frequency distribution of respondent characteristics and each research variable. Bivariate analysis was used to examine the relationship between food service and patient satisfaction, as well as the relationship between food service and patient food waste. The statistical test used was Yates' Correction test with a significance level of 0.05, and the data were analyzed using SPSS.

Result and Discussion

The results of this study include an analysis of respondent characteristics, age, gender and education, an analysis of the influence or relationship of independent variables (food service) on dependent variables (patient satisfaction and leftover food) presented in the table below.

Table 1. Distribution of Respondents by Age

Age	n	(%)
≤ 47 Years	23	41.8
>47 Years	32	58.2

The table above shows that the majority of respondents, based on age, were >47 years old, representing 32 respondents (58.2%). The age data for respondents was normally distributed, so the mean value was 47 years.

Table 2. Distribution of Respondents by Gender

Gender	n	(%)
Woman	30	54.5
Man	25	45.5

The characteristics of respondents based on gender in the table above show that the majority of respondents are women, namely 30 respondents (54.5%).

Table 3. Distribution of Respondents by Education

Education	n	(%)
Not yet in school	3	5.5
Didn't finish elementary school	5	9.1
Graduated from elementary school	18	32.7
Graduated from junior high school	11	20.0
Graduated from high school	10	18.2
Graduated from Diploma III	5	9.1
Graduated from Bachelor's degree	3	5.5
Total	55	100.0

Based on the table above, it shows that the characteristics of respondents based on education are that the majority have completed elementary school, namely 18 respondents (32.7) and the fewest respondents have completed a bachelor's degree and have not attended school, namely 3 respondents each (5.5%).

Table 4. Distribution of Nutrition Installation Food Service Assessments

Food Service	n	(%)
Good	54	98.2
Not good	1	1.8

The assessment of the Nutrition Installation's food service based on the table above shows that 54 respondents (98.2%) rated the service as good, and only 1 respondent (1.8%) rated it as poor.

Table 5. Distribution of Patient Satisfaction

Food Service	n	(%)
Satisfied	54	98.2
Not satisfied	1	1.8

Based on the patient satisfaction assessment table above, it shows that 54 respondents (98.2%) stated that they were satisfied with the installation's food service, and only 1 respondent (1.8%) was dissatisfied.

Table 6. Patient's Remaining Meals

Food Service	N	(%)
Remaining	16	29.1
Nothing Left	39	70.9

Based on the table above, the results show that most of the patients' food was left over or finished, as many as 39 respondents (70.9%), and there was leftover for 16 respondents (29.1%).

Table 7. Relationship between Food Service and Patient Satisfaction

Service Eat	Patient Satisfaction				Total N%	P value
	Satisfied		Not satisfied			
	n	%	n	%		
Good	54	40	0	0	54 98.2	0.018
Not good	0	10	1	1.8	1 1.8	

The table above shows that 54 respondents (98.2%) stated that the food service was good and satisfactory, and 1 respondent (1.8%) stated that the food service was poor and dissatisfied. The results of the bivariate analysis using the Chi-square test showed that the probability value was $0.018 < \alpha (0.05)$, so it can be concluded that there is a relationship between food service and patient satisfaction.

Table 8. Relationship between Food Service and Patient Leftovers

Service Eat	Patient's Leftover Food				Total N%	P value
	Remaining		Nothing Left			
	n	%	n	%		
Good	15	27.3	39	70.9	54 98.2	0.219
Not good	1	1.8	0	0	1 1.8	

The table above shows that 39 respondents (70.9%) stated that the food service was good with no food leftovers, and only 15 respondents (27.3%) stated that the food service was leftovers, while only 1 respondent (1.8%) stated that the food service was poor and leftovers. The results of the bivariate analysis using the Chi-square test showed that the probability value of $1.00 > \alpha (0.05)$, so it can be concluded that there is no relationship between food service and patient satisfaction.

Based on research conducted by respondents, food service based on indicators of punctuality of distribution, cleanliness of cutlery and attitude of waiters at UPT RSUD Latemmamala Kab. Soppeng all showed good assessment results, there was only one hospital food service that was

considered less good because it did not reach 100%, namely food variety, from 55 respondents there was one respondent who stated that the variety of food menus at RS Latemmamala Kab. Soppeng was less varied.

The punctuality of meal delivery at La Temmamala Soppeng Regional Hospital is good because the food service staff have carried out their duties according to their respective SOPs, thus minimizing working time and preventing delays in food distribution to patients. Also, the presence of four waiters in one shift allows for dividing the space for meal delivery by considering the number of patients and the distance between each treatment room, so that no treatment room receives late food distribution.

Cleanliness of cutlery is also an indicator related to the assessment of food service in hospitals. According to Tiara Pratiwi (2020), the food serving utensils used are a factor that significantly influences the enjoyment of food consumed by patients. According to Masri (2021), the rule for food serving utensils is to maintain cleanliness. This is very important because it affects the appearance of food and a person's appetite. Clean utensils should not be broken, etc.

Research results related to the cleanliness of eating utensils showed that 55 respondents (100%) stated that eating utensils at Latemmamala Regional Hospital were clean. This is because at the Hospital Latemmamala has maintained the cleanliness of eating utensils by washing them using a *water heater*, serving food using *stainless steel food trays* or divided plato trays, which are complete with lids and do not break, and vegetables are packed in plastic clips so that food does not mix and is protected from contamination and keeps food warm until it reaches the patient's room.

Another indicator that supports food service in hospitals is the way waiters and waitresses serve food to patients. Based on research results at La Temmamala Regional Hospital, respondents stated that the appearance of food handlers at La Temmamala Regional Hospital was 100% good. According to Sastrianegara in Rachmawati et al., (2021), service quality measured by appearance or physical performance that can be trusted is clean and neat clothing, complete with identity and confident appearance of officers as well as hospitality, politeness and respect for patients. From the data obtained, it shows that the treatment of food handlers at La Temmamala Regional Hospital, Soppeng Regency is friendly because they apply "greetings and smiles" to patients and their families when delivering food. The data also shows that the appearance of officers is neat and clean, wearing masks and identification, and asking permission when taking cutlery, this makes patients feel satisfied with the food service at La Temmamala Regional Hospital, Soppeng Regency.

For the research results with the food menu variation indicator, it was found that some patients or respondents felt that the food menu variety was still lacking (Dewi et al., 2026; Handayani et al., 2026; Salsabila, 2023). According to Purba in Tiara Pratiwi, (2020) this food menu variety is closely related to patient satisfaction because it can relieve boredom. Food variety is important because if it does not use a variety of ingredients, patients may get bored with hospital food, even if the food is cooked differently (Makatsori & Miles, 2026; Trinca et al., 2022; Powathil & Kr, 2023). Although some respondents stated that the food menu at La Temmamala Regional Hospital was not varied, most respondents assessed that the food menu was varied. This diversity of answers or patient assessments is due to the La Temmamala Regional Hospital using a 10-day + 1 day menu cycle, in addition to the average menu cycle for patient hospitalization of 3-5 days. This length of hospitalization is classified as short-term and can influence patients' assessment of food variety at the hospital.

The presence of patients who stated that the food at La Temmamala Regional Hospital is not varied could be because the menu that patients receive is based on the type of disease that is related to the processing or cooking method of the food, not because the type of food is not varied. For certain diseases, food can only be served by cooking using water (cooking) not with

oil (frying), this is what may trigger patient boredom with hospital food especially if they have been hospitalized for 3 days or more. This certainly serves as input for the Nutrition Installation of La Temmamala Regional Hospital to be more innovative in creating menu variants for types of diseases with special diets.

Hospital food service at La Temmamala Regional Hospital was then categorized into two categories based on the four indicators: good if all four indicators were met, and poor if any one of the four indicators was not met. The results of the assessment by 54 patients were positive, while only one respondent gave a poor rating.

Overall, the survey results of inpatients at La Temmamala Regional Hospital (RSUD La Temmamala) regarding food service can be categorized as good. This is because of the four aspects of food service assessment: timeliness, menu variety, equipment cleanliness, and staff appearance, the average patient gave a good rating. This means that all four aspects of food service have been implemented well in the Nutrition Installation and by officers related to food management, so the results of the patient assessment can be interpreted as food service meets standards.

The way food is prepared and the care given to patients will influence their level of satisfaction with the service (Taybele et al., 2026; Potsi & Syngelakis, 2025; Sahar et al., 2025). For example, the way food is served encompasses everything from selecting the food to storing it, preparing it, and how it is presented to the patient. This includes how the food looks, its color, size, shape, and flavor, as well as how it tastes, including its aroma, temperature, seasoning, and doneness, the variety of food choices available, and how the food is presented. It also encompasses things like punctuality, cleanliness, and how staff act and behave (Ximenes, 2025; Lubis & Santoso, 2026).

The level of satisfaction shows that of all respondents, 54 respondents (98.2%) stated that they were satisfied with the food service at the Latemmamala Regional Hospital, Soppeng Regency, and 1 respondent (1.8%) stated that they were dissatisfied with the food service at the Latemmamala Regional Hospital, Soppeng Regency. The high level of patient satisfaction at the La Temmamala Regional Hospital is due to the overall food service that has fulfilled the desires and needs of the patients. patient expectations, patients do not feel disappointed with the food service and those who serve them so that patients feel satisfied.

Food waste is an impact of the nutritional service system in hospitals, Gomes et al. (2020) . Food waste is categorized as high if it exceeds 20% (Ministry of Health, 2013) . Patient food waste is inversely proportional to the acceptability of food in hospitals. The higher the acceptability of food means the less the patient's food waste. Based on the results of the researcher's observations, most patients' food acceptability is high so that patient food waste can be considered low. Patients with high acceptability and no leftovers were 39 respondents (70.9%), and patients with low acceptability and leftovers were only 16 respondents (29.1%). The number of patient food waste at La Temmamala Regional Hospital is low because the provision of hospital food runs according to the proper PGRS guidelines, especially for patient menus, both those on a normal/regular diet and those on special diets, all of which have a variety of menus with standard seasonings that have been measured so that it is far from possible for patients to get bored and feel that the patient's food has no taste and is always the same. The provision of hospital food at La Temmamala Regional Hospital also uses a centralized system, so that supervision can be carried out more carefully, thereby minimizing dietary errors.

Based on the results of the SPSS test using *the Yate's Correction test* , a p value of 0.018 (<0.05) was obtained, which means there is a significant relationship between food service and patient satisfaction. This study is in line with research conducted by Rachmawati et al., (2021) which stated that punctuality, cleanliness of cutlery, menu variety, and the appearance of food

handlers have a significant relationship with a p value of <0.05 . The results of the analysis of food service on patient food waste showed that the p value was $0.219 > \alpha (0.05)$, so it can be concluded that there is no relationship between food service and patient food waste. This is not in line with research conducted by Ira Isabella, (2021) which showed that there is a relationship between food waste and patient satisfaction. Food waste is an impact of the nutrition service system in hospitals Gomes et al. (2020)

Conclusion

Based on results study Regarding the nutritional installation food service on patient satisfaction and leftovers, it can be concluded that there is a significant relationship between food service and patient satisfaction with a p value of 0.018, and there is no significant relationship between food service and leftovers with a p value of 0.219. The hospital should routinely conduct evaluations related to food provision, in terms of the quality of food ingredients, facilities and infrastructure, and patient acceptance. Nutritionists can innovate in compiling and developing a diverse and attractive balanced menu, while waiters must continue to pay attention to personal hygiene, neatness, use of PPE and ethical politeness.

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