Relationship of Food Leftover with Covid-19 Inpatients Recovery Speed in Palembang Indonesia

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A B S T R A C T

Background: Hospital nutrition services support the patient's recovery process, which the activity is feeding. One indicator of quality in food service is food leftover. The high food waste can affect the patient's health. The high food waste will pose a risk of malnutrition in hospitalized patients. The study aimed to analyze the food leftovers in COVID-19 inpatients at the Palembang referral hospital. **Methods:** This cross-sectional quantitative descriptive study was with a sample of 112 patients selected by purposive sampling in February-May 2021. Data were taken using the Comstock form and then translated in the form of percent leftover food. According to the Minister of Health, the minimum leftover food is less than 25 percent. **Results:** The results showed that more than 25 percent of the leftover food were 51 respondents; Thirty-three respondents (54.1%) have fully recovered and 28 respondents (45.9%) still in improvement. On the other hand, the leftovers food of less than 25 percent were 51 respondents; Forty respondents (78.4%) have fully cured, and 11 people (21.6%) still in treatments. The analysis of Chi-square test results shows a p-value of 0.013, showing a significant relationship between food waste and the recovery of COVID-19 patients. **Conclusion:** The food waste of COVID-19 patients in referral hospitals was still relatively high. It is necessary to modify the diet menu to prevent leftovers and speed up the patient's recovery.

1. Introduction

Hospital nutrition services patients adapted to clinical conditions, nutritional status or body metabolism[1]. Hospital dining is an activity that starts from menu planning to evaluation to provide quality food according to nutritional needs, costs, safe and acceptable to consumers to achieve optimal nutritional status and accelerate patient recovery[2]. The management of food administration in hospitals is also strongly influenced by the food waste factor as an indicator of a hospital's quality of minimum service standards[3]. The food served in the hospital serves to maintain the immune system and help the healing process so that the food served must meet the needs of both quality, quantity, adequacy of nutrition, and the accuracy of the diet[4].

Measurement of food quantity is by weighing or using a visual estimate. Visual estimates, such as the Comstock method[2], are easy to do, inexpensive and widely used to assess food waste in large amounts of food administration[5]. The visual methods

demonstrated that the hospital average food waste could easily compare to the weighting scheme[6]. Weighing estimates, such as the waste audit, calculate plate waste for the average meal[7]. It is crucial for assessing food waste in inpatients, especially COVID-19 patients, to evaluate food service activities in hospitals. There are currently no publications regarding food waste at the COVID-19 referral hospital in Palembang City.

2. Methods

This research was conducted at the COVID-19 referral hospital in Palembang city, i.e. Siti Fatimah Regional General Hospital, Ernaldi Bahar Hospital, RK Charitas Hospital, Palembang BARI Hospital, and Moehammad Hoesin Hospital Palembang. Data collection was carried out three times a day at mealtimes (breakfast, lunch and dinner) from February to May 2021. The Lameshow sample size was 112 hospitalized patients by equal number to the regular and special diets. The respondents carried out data collection by filling out a Google form distributed by nurses and the COVID-19 room dietician.

Food leftovers for COVID-19 patients were considered infectious objects and directly disposed of the infectious waste[8,9]. The types of food consisted of rice/staple, animal protein, plant protein, fruits and vegetables, water and milk. The classification were; 0% (no leftovers), 25% (quarter portions of food leftovers), 50% (half portions of leftovers), 75% (three-quarter portion leftovers) and 100% (there are whole food leftovers). The Universitas Sriwijaya Faculty of Public Health issued a Certificate of Research Ethics with 43/EC/KBHKI/FK-UMP/XI/2019.

3. Results

The one hundred and twelve respondents who met the research inclusion criteria were aged 18-70 years, cooperative, receiving regular or special diets, and did not use a ventilator. Table 1 shows the characteristics of responders. There were more respondents over the age of 40, more men than women, and more higher education than low education than SMA. Hospital food has various processed variations (Figure 1). The results showed that staple foods had the most leftovers by patients. The association between food waste and the respondent's recovery was shown in Table 2. The p-value of the test was 0.013, less than the significant level of 0.05.

Table 1. Characteristics of respondents based on age, gender and education (n=112)

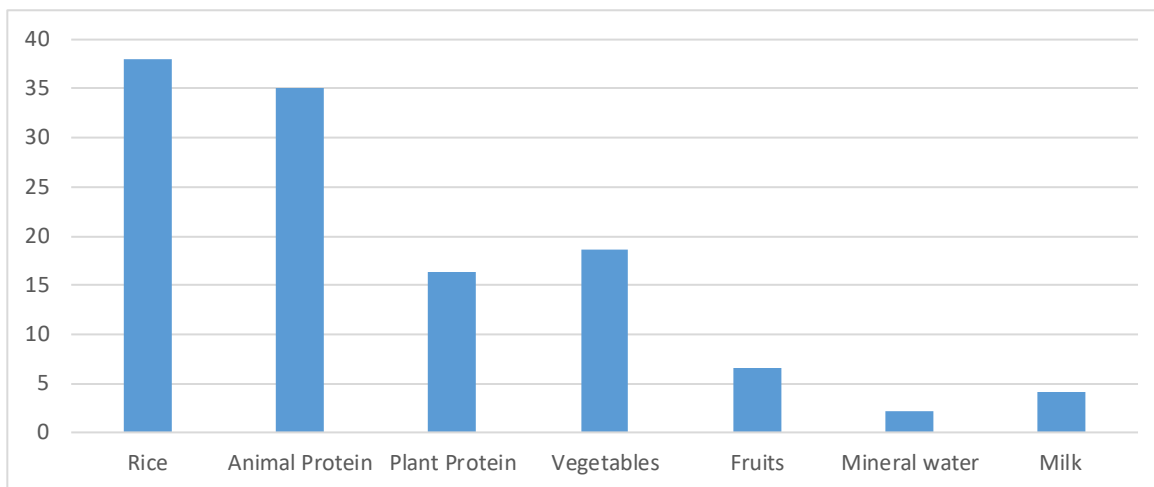| No	Characteristics	n	%
1	Age		
	<40 years	50	44.5
	40 years	62	55.4
2	Gender		
	Male	59	52.7
	Female	53	47.3
3	Education		
	Lower than senior high school (SMA)	11	9.8
	Higher or equal to SMA	101	90.2

Figure 1. Food leftovers by percentage of food types

Table 2. Relationship between food waste and healing process (n=112)

Leftovers	Recovery				Total		p-value	OR	95%CI
	Full		Repair						
	n	%	n	%	n	%			
Not good (>25%)	33	54.1	28	45.9	61	100			
Good (≤25%)	40	78.4	11	21.6	51	100	0.013	0.324	0.140-0.748
Total	73	65.2	39	34.8	112	100			

4. Discussion

The staple food was left mainly by inpatients. Purwakarta Holistic Hospital uses the standard portion of "little" for the patient's meal menu to deal with the leftover staple food[10]. At RSUD dr. Soeratno Gemolong showed that the types and preparations of plant protein affected the patient's assessment. Plant protein was the most left by the patients because some were not fond of tofu and tempeh. The types of plant protein lack plating, which causes patients to be lazy to eat[11]. Nutrition installations should develop the creativity of processing and cooking foodstuffs such as tofu and tempeh foodstuffs can be spent by patients[12]. Others have discovered similar tendencies, with over 40% of serving veggies going uneaten compared to only 18% of entrees. This could be due to hospitalized patients' decreased appetite for veggies due to inadequate cooking practices[13]. Most studies show less leftover food at breakfast (morning meal) than other main meals, although this was not a general finding[14].

The odds ratio in this study was 0.013, which implies there was a 0.324 times greater probability of healing faster. In 2017 showed that changing rice portions in the patient's diet can reduce food waste (r=0.804; p<0.05)[10]. At the Universitas Muhammadiyah Malang Hospital, the average patient leftover food in 3 meals was 57% [15]. The factors influencing the patient to leave food are internal factors (clinical conditions, eating habits, gender) and external factors (food taste, food temperature, texture, food colour, portion and variety of food ingredients, environmental factors/out-of-hospital food)[16]. Inpatients experienced changes that can affect food intake or absorption, metabolism, and excretion of nutrients; changes in appetite, senses of taste and smell[17]. The COVID-19 patients suffered from sensory disorders called anosmia, either momentary or sedentary, caused by a mechanical blockage inhibiting the smell reaching the nerves and eventually losing the sense of smell[18]. The hospitalized COVID-19 patients admitted to the ICU are suffered from anorexia secondary to an infection, dyspnea, dysosmia, dysgeusia, stress, confinement, and organizational problems limiting the desire to eat[19]. These issues

substantially impact the COVID-19 patients being treated, resulting in insufficient food intake, wasted food waste, and a slowdown of the patient's recovery [20].

This study had several limitations. Respondent bias can be caused by the demographic of respondents above the age of 40. Respondents may be frustrated by the usage of a Google form to collect data. Hospital policies changes during a pandemic. Due to direct infectious waste management, leftover food bypass the nutrition installation for waste inspection can result in a misjudgment of exact leftover food.

5. Conclusion

The food waste of COVID-19 patients in referral hospitals was still relatively high. While high food waste will affect the time it takes for patients to recover, better food service delivery and diet modification quality are demanded.

6. Acknowledgment

7. References

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