

# PATIENT SATISFACTION CONTRIBUTING FACTORS ON HOSPITAL FOOD SERVICE: A SYSTEMATIC REVIEW

<sup>1</sup>EMMY RIDHAWATY MANGUNSONG, <sup>2</sup>PURNAWAN JUNADI

<sup>1,2</sup>Magister of Hospital Administration Program University of Indonesia, University of Indonesia  
E-mail: emmy.ridha@gmail.com

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**Abstract** - Introduction: Hospital food services are one of important component in healthcare management of patients and one of the most relevant items of health care quality perceived by patients and by their families. The provision of patient meals should be regarded as a component of hospital treatment which can promote recovery. Inpatient satisfaction is not only about core services in health care but including communications, sociability and food services in hospital. The relationships between consumer satisfaction, perceived quality and the food service characteristics are largely unexplored. Knowledge of these associations to be an important basis to measure the impact of foodservice innovations and to measure client foodservice satisfaction. The aim of this systematic review is to identify contributing factors of patient's satisfaction on hospital food service. Method: This systematic review based on PRISMA protocol. Literature retrieved from online database such as ProQuest and Sage. Over a total of 1.280 potential articles, 9 journal articles were chosen as eligible library to be reviewed. Result and Discussion: All nine journal articles reviewed, performed their studies in hospitals. Variables to be considered in order to maintain the quality of hospital food : by food characteristic are taste, appearance, variability, and warmth of food being served, by food distribution are the use of bulk-trolley system, time of food distribution, attitude and behavior of serving staff. Conclusion: Food service aspects were the most silent influences of satisfaction, thus regularly monitoring patient satisfaction is a must in maintaining patient satisfaction in hospital food service.

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**Keywords** - Patient satisfaction, Food service, Hospital food service

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## I. INTRODUCTION

Food is important to quality of life, although it also is a basic human need and fundamental to health and should be considered a fundamental human right.[1]Hospital food services are an important component in the healthcare management of patients.[2]The provision of patient meals should be regarded as a component of hospital treatment which can promote recovery, especially if patients have no other options for getting food while hospitalised.[2] Convenience of the patient in the hospital can immediately cure them.

Patient satisfaction is defined as an evaluation of distinct healthcare dimensions.[3] Inpatient satisfaction is not only about core services in health care, but including communications, sociability and food services in that hospital. Using patient perceptions as an indicator of service quality in health care goes parallel to the developments in other service sectors.[4]An important aspect influencing patients' satisfaction with hospital stay is their relationship to food, nutrition being a part of hospital care.[5]

Customer satisfaction with hospital food service is multifactorial and difficult to assess, particularly because each patient has their expectations.[6] Patient satisfaction however, seems to be enhanced by the service of snacks between meals, in serving hours other than those of the standard meals.[7]The service and consumption of food and beverages breaks the monotony of a long, unexciting day and could be an important component in the improvement of patient.[8] The relationships between consumer

satisfaction, perceived quality and the food-service characteristics are largely unexplored. Knowledge of these associations seems to be an important basis from which to measure the impact of foodservice innovations or to measure client foodservice satisfaction outcomes over time.[9]As hospitals strive to improve measures of service for patients under their care, every element of the patient care process is examined for opportunities to improve the quality of care and the presence of a patient-centered approach.[10]

However, hospital food is often negatively perceived as: cold, tasteless, poorly presented and badly served.[11]Hospital expectations often place the food and nutrition service as an undervalued support service, even though changes and improvements in hospital diets and nutritional care can prevent nutritional aggravations that have a negative impact on the length of hospital stay and hospitalization costs.[12]

The aim of this systematic review is to identify factors contributing to patient's satisfaction on hospital food service.

## II. METHOD

Searching literatures of published journals using PRISMA methodology as seen in figure 1. Journals were searched using database online from Scopus and Sage. In early stages, journals were searched by using a specific keyword is "hospital food service" and "patient satisfaction". Then, journals were screened by year, title and abstract. All journals are retrieved

published in 2000-2016 to obtain the information. Journals that are not relevant to the topic of study was issued.

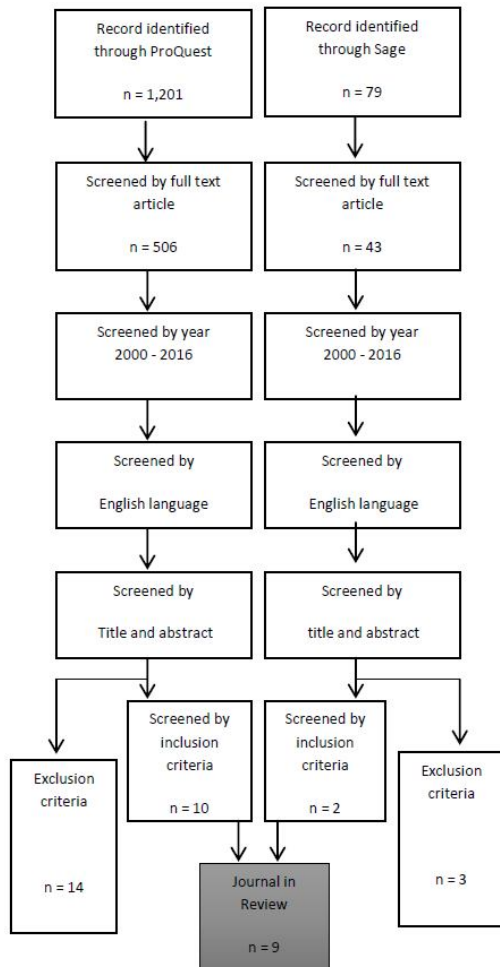


Figure 1. PRISMA Systematic Review Flowchart

### Inclusion and Exclusion Criteria

Studies were included and assessed for the eligibility in this systematic review if they (1) study took place in a hospital, (2) assess the factors of patient satisfaction, and (3) mention a positive result obtained from the study. Studies were excluded if the libraries that insufficient information to be compared with the other articles, also if they (1) did not take place in a hospital, (2) did not assess the factors of patient satisfaction, and (3) did not mention a positive result out of the study.

## III. RESULT AND DISCUSSION

### Study Selection

In the identification phase, 1,280 journal articles were gathered (ProQuest 1,201 and Sage 79). Out of these 1,280 articles, 1,252 screened using engine filter, provided by each source of online journal database, 28 journals were deemed relevant. Next step is manually assessed for eligibility by inclusion and exclusion

criteria, first by heading and abstract, leaving 12 journals; then read the full text journal, which then remaining 9 journal articles for qualitative synthesis.

### Assessment

All nine journal articles reviewed, performed their studies in a hospital. They measure the factors affecting patient satisfaction on hospital food service. In which each of the factors have their own dependent and independent variables.

Thus, the factors contributing patient's satisfaction on hospital food service are:

#### 1. Food Characteristic

According to Sahin, B. et al (2006), the most important determinant of overall dissatisfaction were found to be the variables of taste and appearance of foods. Other variables obtained out of this study are: variability of food, warmth of food, time of food distribution, amount of food, cleanliness of cutlery (fork, spoon, and dishes), and also the attitude and behaviours of the serving staff. In this study, suggest that improving the quality of taste and appearance would result in increase in the number of patient satisfied with hospital food and food services.[4]

In the study by Ahmed, M. et al (2015), result in the good relationship between hospitals and suppliers affecting to the process and the quality. Starting from the food procurement process (raw material specification, supplier selection, purchasing, and receiving and storing), food production, food service, to the patient orders, all have their contributing factors on patient satisfaction.[11]

A study by Messina, G. et al (2009), on patients' satisfaction on hospital food, reported that food quality (taste, presentation, flavor, preparation, variety) is the best predictor of overall satisfaction. This study suggest a wider menu, information on ingredients, and better timing, distribution and presentation of food, is important variable to measure.[5]

Jeong, J. and Seo, S. (2011) found that satisfaction on hospital food is very much affected by both food quality and service quality. Respondents in this study rated food quality attributes lower than service quality attributes. They perceived little variety in the foods offered and felt that the food was not as well prepared as they expected.[1]

Wright, O. R. L. and Connelly, L. B. (2006) did a study on acute care consumers satisfaction with hospital food service and foodservice characteristics. This study found that foodservice satisfaction was strongly associated with variety, flavor, meat and vegetables texture, temperature, meal taste. Regularly monitoring patient satisfaction with variety, flavor, meat and vegetables texture, temperature, meal taste,

appears to be desirable, as this food service aspects were the most salient influences of satisfaction.[9]

Variables to be considered in order to maintain the quality of hospital food in food characteristic: taste, appearance, variability, and warmth of food being served.

## 2. Food Distribution

According to study by Hartwell, H. J. et al (2001), found that the food served with trolley system is hotter than plated meal system. Temperature of delivery food with plated meal system is less than satisfactory. Plated meal could change the form and quality of the food. With the trolley system, temperature is maintained well and the patient reflect greater satisfaction than the plated system. The trolley system has the potential being safer and favoured by patients, and increase the patient satisfaction which can lead to improve the patient morale and speedier recovery.[8] In another Hartwell, H. J. et al (2007), more finding obtained out the this second study on bulk versus trolley system. Trolley system has the benefit of correct temprature, correct texture, and good flavor; while plate system has a benefit of good portion size, but a negative side of poor temperature, and poor texture. Temperature and texture were the most important attributes that determine satisfaction with food, thus defining the focus and strategy for hospital food service managers.[6]

Jamaludin, R. et al (2010) on patient' satisfaction, and energy-and-protein intakes, bulk-trolley food service system, mention that patients did not obtain full energy and protein requirements from hospital food provided. Though the bulk-trolley system increases satisfaction and food intake among patients.[2]

Mentziou, I. et al (2014), mention that as the strongest hospital marker on patient satisfaction, quality, safety, and organoleptic of the meals are giving the impact to patient satisfaction. The use of gloves when prepared the food, pre-packed spoons for the soup and the canned fruits in syrup, suggested tastier and higher portion. The hygiene-ness of food preperation is most considered by patients.[7]

Variables to be considered in order to maintain the quality of hospital food in food distribution is: the use of bulk-trolley system, time of food distribution, attitude and behavior of serving staff.

## CONCLUSIONS

There are aspects which could affect patient's satisfaction on hospital food service based on food characteristic: taste, appearance, variability and warmth. Based on food distribution; the use of bulk-trolley system, time of food distribution, amount, cleanliness of cutlery, attitude and behavior of staff.

Food service aspects were the most silent satisfaction. Regularly monitoring patient satisfaction is a must in maintaining patient satisfaction in hospital food service.

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## Appendix 1. Journal Review Based on Paramaters

Journal Parameter	Jeong,J. ; Seo,S.	Jamaluddin,R. ; Manan,N.A.A. ; Basri,A.M. ; Karim,M.S.A.	Messina,G. et al
<b>Title</b>	<i>Importance of satisfaction with food for older adults' quality of life.</i>	<i>Patients' satisfaction with the bulk trolley system in a government hospital in Malaysia.</i>	<i>Patients' evaluation of hospital foodservice quality in Italy: what do patients really value?</i>
<b>Time of Research</b>	2011	2010	2009
<b>Method</b>	<p>This study analyse the quality of life from pension house in korea , identified the correlation between satisfaction with food-related life (SWFL), perceived foodservice quality, and quality of life for older adults. 238 Participants were limited to residents over 65 who were not hearing impaired and not suffering from dementia. Perceived foodservice quality consisted of 25 items, including both food quality and service quality attributes.</p>	<p>An interview-based questionnaire was used to measure patients' satisfaction (n = 70) with the hospital food services. Patients who stayed on the third class ward for at least two days, were between 18 and 60 years of age, consumed a normal diet, were able to speak and were not required to fast as part of their medical procedure. The questionnaires on patient satisfaction with the food service included 22 items assessing four dimensions, which were food quality, meal service quality, staff service issues and physical environment. A ward bulk trolley system is defined as a system where meals are ordered in advance, or chosen at the point of service when the trolley is wheeled to patients in the ward, that enables the patient to see and select the food.</p>	<p>- This study collecting patients (aged 18+ years (n = 927)) preferences using a slightly modified version of the Acute Care Hospital Foodservice Patient Satisfaction Questionnaire (ACHFPSQ) in correlation with food quality, staff issues, patients' characteristics, hospital recovery aspects and overall foodservice satisfaction (OS). - Four dimensions of foodservice satisfaction were found by factor analysis: 'food quality' (FQ), 'meal service quality' (MSQ), 'hunger and food quantity' (HQ) and 'staff/service issues' (SI).</p>
<b>Variable</b>	Satisfaction, food quality and service quality attributes.	Patients' satisfaction and energy and protein intakes ,Bulk trolley food service system .	Patients' Satisfaction, Hospital Food
<b>Analysis</b>	- Older adults clearly regard staff service as important. Service quality, especially such staff attitudes as kindness and courtesy, was important to older adults in their satisfaction with dining service.	The satisfaction scores in this study were not linked to the nutritional intake of the subjects. Even though subjects were satisfied with the system, the energy and protein intake from hospital food hardly met their	Studies have reported that food quality (taste, presentation, flavour, preparation, variety) is the best predictor of overall satisfaction. Patients hospitalized in departments far from the

	<ul style="list-style-type: none"> <li>- Respondents rated food quality attributes lower than service quality attributes. They perceived little variety in the foods offered and felt that the food was not as well prepared as they expected.</li> <li>- Food quality itself did not fulfill expectations of meals, suggesting that research must identify residents' expectation levels and discover differences between expectations and perceptions of food quality</li> </ul>	<p>individual requirements. The bulk trolley system was correctly implemented among patients in the third class ward, it may increase satisfaction and food intake among the patients, compared to the patients in the upper class ward.</p>	<p>central kitchen complained about the temperature of hot food.</p> <p>The research has some limits, the first being that patients' overall satisfaction with foodservice is difficult to measure and quantify since it is largely subjective and influenced by many variables.</p> <p>Limitation : men had a 53% higher probability than women of positive judgement of overall quality.</p>
<b>Result</b>	<ul style="list-style-type: none"> <li>- The results showed that perceived foodservice quality had a strong association with SWFL; SWFL had a significant positive association with quality of life; perceived foodservice quality positively related to quality of life. Increased SWFL would improve quality of older adults. Response on SWFL items: (max. 5.00)</li> <li>- "Food and meals are positive elements in my life" (mean = 3.57);</li> <li>- "I am generally pleased with my food" (mean = 3.45); Response on perceived food quality (max. 5.00):</li> <li>- "Tableware such as spoon and chopsticks are not missing on my tray" (mean = 4.04);</li> <li>- "The dining room employees are friendly" (mean = 3.95);</li> <li>- "The dining room employees are always willing to help me" (mean = 3.90).</li> </ul> <p>LOW RESULT:</p> <ul style="list-style-type: none"> <li>- "A variety of foods are offered" (mean = 3.13) ;</li> <li>- "Foods was as good as I expected" (mean = 3.15).</li> </ul>	<ul style="list-style-type: none"> <li>- The majority of the patients (98.6 %) were satisfied and 1.4 % was moderately satisfied with the food service. From the total of 70 subjects, 32.9% of subjects were very satisfied, while 65.7% were satisfied and 1.4% moderately satisfied with the food services. None of the subjects were dissatisfied with the food services.</li> <li>- The Energy (kcal) and protein (g) intakes from hospital food (<math>1036.70 \pm 316.10\text{kcal}</math> ; <math>36.68 \pm 14.14 \text{ g}</math> ) were higher than that of outside food (<math>354.91 \pm 329.68\text{kcal}</math>; <math>11.04 \pm 10.73 \text{ g}</math> )</li> <li>- However, most patients did not obtain their full energy and protein requirements from the hospital food provided. It only fulfilled 39.1 % and 49.1% of energy and protein requirements of 60% from the study.</li> </ul>	<ul style="list-style-type: none"> <li>- Items investigating staff/service issues were the most positively rated (83,4% answered that staff who delivered meals were always neat and clean; 70,7% that staff who took away finished meals were friendly and polite; 60,0% that staff who delivered meals were helpful).</li> <li>- Some items investigating food quality were the least positively rated (56,6% answered that hospital food was sometimes/rarely/never as good as expected; 64,3% answered that they sometimes/rarely/never liked the way vegetables were cooked; 60,0% answered that meals had sometimes/rarely/never excellent and distinct flavours).</li> <li>- FQ (Food Quality) factors had OR=6.07 related to patients satisfaction. While other factors (MSQ (OR = 2.41), HQ (OR=1.61), SI (OR=1.30)) influences less in patients satisfaction.</li> </ul>
<b>Suggestion</b>	<p>This study not showing a result in hospital, however it can describe the satisfaction from the patient, older people in this study, were correlated in the type and the taste of the</p>	<p>High satisfaction rates may not indicate high intake of hospital food for a number of reasons.</p> <p>Need for the hospital</p>	<p>Improvement in Food services are : a wider menu, information on ingredients, and better timing, distribution and presentation of food.</p>

	food.	authority to determine patients food preference and food acceptance in order to enhance food intake.	To improve food quality, it may be necessary to train operators to choose high-quality primary materials
<b>Journal Parameter</b>	<b>Hartwell,H.J ; Edwards, J.S.A. ; Beavis,J.</b>	<b>Wright,O.R.L. ; Connelly,L.B.</b>	<b>Mentziou I., et al</b>
<b>Title</b>	<i>Plate versus bulk trolley food service in a hospital: comparison of patients' satisfaction.</i>	<i>Consumer evaluation of hospital foodservice quality : an empirical investigation</i>	<i>Evaluation of food services by the patients in hospitals of Athens in Greece</i>
<b>Time of Research</b>	2000	1996 - 2001	September 2009 - April 2010
<b>Method</b>	<ul style="list-style-type: none"> <li>- A consumer opinion card (n = 180), concentrating on the quality indicators of core foods, was used to measure patient satisfaction and compare two systems of delivery, plate and trolley.</li> <li>- Binary logistic regression analysis was used to predict food service style on the basis of the food attributes measured. Further investigation used multinomial logistic regression to predict opinion for the assessment of each food attribute within food service style.</li> <li>- The core foods selected - were carrots, broccoli, a minced beef dish, a poached fish dish, creamed potatoes, and a cold pudding - are selected because they appeared in both plate and bulk trolley system.</li> <li>- Indicators are the temperature, flavor, portion size, texture, and overall satisfaction of the food were analyzed.</li> </ul>	<p>Data source from 2 Queensland, Australia, public hospitals ( total 1050 beds) and 1 private (360 beds). 1807 inpatients samples are received the survey form. The patients who had consumed at least 1 meal and be able to respond the survey complete (ACHFPSQ). 540 give the responds (59%).</p> <p>The exclusion criteria is all the patients included in paediatric, psychiatric, inability to complete the forms, who no receive any meals.</p> <p>The effect between the both private and public hospitals was examined, that the private may have higher expectations rather than the public one.</p> <p>The data is analyzed with chi square, in differences of food services satisfaction based on contextual and demographic characteristics.</p> <p>Regression analysis was conducted to measured the influence of 21 foodservice attributes and 7 contextual items on overall foodservice satisfaction</p>	<p>11 Hospitals as the data source. Interview with 14 questions used for adult hospitalized patients (637 patiens), random. Analysed with statistical program PASW 18.00</p>
<b>Variable</b>	Plate Food Service , Bulk trolley food service, Patient Satisfaction	Variation of food services, variation of food service satisfaction, sample contextual and demographic characteristics.	Patient Satisfaction and Food services

<p><b>Analysis</b></p>	<p>Trolley system :</p> <ul style="list-style-type: none"> <li>- correct temperature</li> <li>- correct texture</li> <li>- good flavor</li> </ul> <p>Plate system has a benefit in:</p> <ul style="list-style-type: none"> <li>- good portion size</li> <li>- poor temperature</li> <li>- poor texture</li> </ul> <p>Temperature and texture were the most important attributes that determine satisfaction with food, thus defining the focus and strategy for hospital food service managers.</p> <p>Limitation :</p> <ul style="list-style-type: none"> <li>- using one hospital and one ward, as a case study, is that recommendations cannot be generalized and, therefore, there is restricted external validity.</li> <li>- The conclusions that can be drawn are only a tentative indication of strength of relation.</li> </ul>	<p>The probability for choosing the foods for the patients has the impact for the satisfaction including for the trade off.</p>	<p>In the Greek Hospitals, the hand hygiene for serving the food had been implemented. The mediocre 88.2% helps for recovering process.</p> <p>taste, image and temperature seem to play an important role as well. As the strongest hospitals marker of patients satisfaction, the quality, safety and organoleptic of the meals are giving the impact to the patient satisfaction.</p>
<p><b>Result</b></p>	<ul style="list-style-type: none"> <li>- The bulk trolley method of food distribution enables all foods to have a more acceptable texture, and for some foods (potato, P = 0.007; poached fish, P = 0.001; and minced beef, P = 0.0005) temperature, and for other foods (broccoli, P = 0.0005; carrots, P = 0.0005; and poached fish, P = 0.001) flavor, than the plate system.</li> </ul> <p>Temperature and Texture are the most contributory factors of patient satisfaction in food services, therefore the trolley system are more likely than the plate system.</p>	<p>Consumers aged 70 years is the largest percentage of the sample rather than the 30 years. Most of them is female, and there are 3 missing data such as length of stay, type of diet and ward of admission. All of the demographic data had no significant differences. The 70 Years patient has a lower satisfaction with the foodservice characteristics. The taste of the meals was the most important determinant of overall foodservice satisfaction. The other items are the variety, flavour, the texture of meat, the temperature, menu staff influence the satisfaction.</p>	<p>There are 52.5% of men and 48% of women (no significant difference), with 61 years (<math>\pm</math> 16.3 years). Overall food score was 7.5 in 10 grade scale. The personnel behaviour 9.2 and the hygiene conditions was 9.1.</p> <p>The most favored food is Passtisio and baked potatoes.</p> <p>There are 0.6% patients got expired food and 1.6% found foreign object inside the food.</p> <p>As the temperature 79.1 - 89.5% said the food had given as their temperature conditions. The food image 93.7% is mediocre, 86.3% of them find tastiness and about 88.2% help to faster recovery. 97.3% the patient think that the food not prepared according to hygiene and the regulations.</p>

			For the improvement 89.9% suggested mre meals, 90.8% asked for using gloves when prepared the food, 91.6% pre-packed the sppons for the soup and the canned fruits in syrup. 41.2% suggested tastier and 78.2% bigger portions
<b>Suggestion</b>	Food served with appropriate sensory properties would meet the criteria of patient satisfaction and lead to a beneficial clinical outcome.	More studies needed to investigate the impact of the customer who loves to customize their food and the harder to please or has higher service expectations. Need analysis of the production costs for the trade-off foods	Another simple and straight forward answers can be used for the further research to reducing the verified answer belongs to patient including the emotional of them.
<b>Journal Parameter</b>	<b>Sahin, B., et al</b>	<b>Ahmed, M., et al</b>	<b>Hartwell, H.J.; Edwards, J.S.A</b>
<b>Title</b>	<i>Factors Affecting Satisfaction Level with the Food Services in a Military Hospital</i>	<i>Food production and service in UK hospitals</i>	<i>A preliminary assessment of two hospital food service systems using parameters of food safety and consumer opinion</i>
<b>Time of Research</b>	January 2004	-	-
<b>Method</b>	In 1000 Beds Hospitals, 780 inpatients, 500 distribud questionnaires, 407 questionnaires returned. The Data analysed with SPSS version 10.00. Inclusion criteria all the patients that can be able to taste and giving the evaluating of the food	2 Small Private Hospitals, 1 large Public Hospitals, Case Study, with interviews methods, about 31 samples.	Data taken from NHS hospital, Women's Health and Orthopaedic wards. Taken Sample from the food of normal diet patients
<b>Variable</b>	Analysing the socio-demographic characteristic of the patients with the quality of the food and food services from the patients perceptions	Food production and service system The impact to patient satisfaction	Microbiology Test with Nutrient agar (identification aerob and anaerob bacteria), Chromocult agar (for E. Coli and accuracy of coliform count). Total Bacterial density was determined after performed 24 and 48 hours. Taking the patient satisfaction of the temperature and the quality of food served with consumer opinion card. Analysis data with SPSS,



			ANOVA test and paired T-Test.
<b>Analysis</b>	<p>The results suggest that increasing the quality of the eight aspects of the foods (taste, appearance, variability, warmth, time of food distribution, amount, cleanliness of fork, spoon and dishes and attitude and behaviors of the serving staffs) can increase the level of overall satisfaction with food and food services, as the main aspects are the taste and appearance of the food.</p>	<p>From the selecting the suppliers and the food procurement are influencing the quality of the food. the good relationship between hospitals and suppliers affecting to the process and the quality.</p> <p>How to storage and receive the raw material are also could improved the quality if well handled by staff. The private hospitals have the simpler process rather than the public.</p> <p>The food production is depends on the patient orders will give a good impact for the hospitals. the patient can choose the food as what they wanted.</p> <p>The 3 of those hospitals used plated system that are depending on the staff or the nurse attitude and behaviors. The staff that had little knowledge will let into the patient dissatisfaction. The more hospitals can provide the patient request, the more chance the hospitals to increase the patient satisfaction</p>	<p>The plated meal system must concern to the chilled foods warming up. The temperature of delivery food with plated meal system is less than satisfactory. The plated meal system could change the form and quality of the foods.</p> <p>With the Trolley system, the temperature is maintained well and the patient reflect greater satisfaction than the plated system.</p> <p>In other hand, if the nurses delivered the foods with trolley system, sometimes when the patient asked them to perform some medical job, the nurses could roll up their apron, and did the medical duties without hand washes.</p> <p>The contamination of the food is very depending on the poor of personnel hand hygiene.</p> <p>The Trolley system has potential being safer and favoured by patients, and increase the patient satisfaction which can lead to improve the patient morale and speedier recovery</p>
<b>Result</b>	<p>84% graduated from high school, 53.7% was single parent, 46.3% were married. 66% got normal food, 30% diet food.</p> <p>The satisfaction of the food is low. They just give the good score for the behaviors of the staff serving foods (85.6%). Just 16.3% patients satisfied with the foods.</p> <p>The taste and appearance satisfaction is 9.5 times and 2.7 times more likely to patient satisfaction rather than the unsatisfied patients.</p>	<p>The Menu has importance things to managing food production or service systems and nutritional considerations.</p> <p>75% of hospitals emphasised the specifications importance for the achieving the product quality. The supplier selection criteria, the purchasing program, receiving procedures and the storing methods are influence to the quality of the food.</p> <p>The daily cooked from the fresh food is one to ensure the quality of the food for</p>	<p>The food that served with trolley system is hotter than plated meal system.</p> <p>From the bacterial tested, the plated meal system founded <math>2.0 - 6.8 \times 10^2</math> CFU of bacteria, and the cafeteria trolley system founded <math>&lt;20</math> CFU of bacteria.</p> <p>Neither Plated and Trolley system contained E.Coli.</p> <p>The patients have any choices for the food, There was no conclusive evidence regarding portion size or flavour and satisfaction with the cold desserts.</p>

		<p>patients.                  For the private hospitals, offered the food as what patients request as the menu services and the menu and nutritional considerations are importance.                  At 2 Private hospitals showed higher level of patient satisfaction rather than the public which has different way for serving the food.</p>	
<b>Suggestion</b>	<p>This study is set to improve the food services and can be used as the data how to increase the patient satisfaction with the food. The managers can use this research as the source to take any continuing improvement and the decisions</p>	<p>Continuous improvement is need to increase the food services performances with the value stream mapping. Need more hospitals to get more diverse data and analysis.</p>	<p>Need more literature regarding the food safety and the food service systems.</p>

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