

Development and Validation of Food Services Satisfaction Scale for Inpatients

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Summary. *Background:* Quality in hospitals includes patient satisfaction which is a multidimensional concept. Food services in hospitals are the most important factors affecting the overall satisfaction of inpatients. This study aimed to develop a scale to determine the food services satisfaction of inpatients, which is an important parameter in terms of health quality standards. *Methods:* The content validity was developed based on the experts' opinions (11 experts) in the development of Food Services Satisfaction Scale for Inpatients (FSSSI). The validity and reliability of FSSSI was carried out on 240 patients with a hospitalization period of at least 3 days in a medical faculty hospital and a private hospital in Konya, Turkey. *Results:* The validity (content and construct validity) and reliability (scale internal consistency) of the FSSSI was analyzed and a scale consisting of 25 items and 6 subscales was obtained. While the Cronbach's Alpha reliability coefficient was found 0.92 for the scale, the Cronbach's Alpha reliability coefficients of the subscales were identified as 0.84 for dietician interest; 0.81 for menu quality; 0.74 for atmospheric quality; 0.71 for food quality; 0.71 for food service quality; and 0.71 for personnel service quality. The "food quality" ($r = 0.85$) was found to be the most correlated subscale with the total satisfaction score. *Conclusions:* FSSSI is recommended as a valid and reliable scale, which can easily and rapidly measure inpatient satisfaction with food services. The scale will be useful in follow-up and assessment of the quality of nutrition services, which are the most important components of patient satisfaction. Through its subscales, it is possible to identify field specific deficiencies and carry out activities for improving the service quality.

Key words: Patient satisfaction, Hospital food services, Health care quality assessment

Introduction

Patient satisfaction, which is deemed as an indicator of quality in health institutions, is expressed as meeting the expectations and wishes of the patients in the best way (1). It includes patient satisfaction which is a multidimensional concept (1-3).

Several studies have shown that food services provided in hospitals are one of the most important factors affecting the overall satisfaction of inpatients (4,5). Because one of the most important factors for hospitalization in the hospital is adequate food intake.

Malnutrition can lead to muscle wasting and immune deficiency, leading to an increase in complication, infection and mortality rates (6,7).

Healthy and nutritious hospital meals encourage patients to eat, helps them to recover from their illness and enhances their quality of life. Also set an example for patients' ideal meal. With increasing the quality of hospital food services, the duration of hospital stay in the hospital decreases and health expenditures decrease (8,9).

While evaluating food services, patients consider the taste, flavor, sensory quality, presentation,

ingredients and hygiene of the food as well as the behavior of the service personnel, and the physical conditions offered (10).

Various scales (11,12) are used to measure the general patient satisfaction in hospitals in Turkey. However, the expressions on food services in these scales seem to be insufficient to determine the root cause for determining the quality and carrying out corrective actions. This study aimed to develop a scale to determine the food services satisfaction of inpatients, which is an important parameter in terms of health quality standards. The intended scale is the first scale specific to Turkey within our knowledge and it can be used to determine the overall food services satisfaction of inpatients.

Materials and Methods

This is validity and reliability study. Approval from the Selçuk University Medical Faculty Non-Clinical Research Ethics Committee (Number of Decision 2016/251) was obtained for the study. An informed consent was obtained from all voluntary participants.

Scale development

In the development of the scale (Figure 1), firstly the literature data (13-16) were prepared in accordance with the interviews conducted with the fifty patients, the two researchers, the eight academicians of nutrition and dietetics department, two biostatistics department and three executive dietitians' knowledge and experiences.

The five point Likert type scale included responses coded between 1 and 5 from "never" to "always". Respondents answered each statement as "Never, Rarely, Sometimes, Frequently and Always". Negative items were reverse-scored (e.g. 1 = 5) so that a high score could indicate satisfaction in all items. The first draft of the scale included 32 items. We consulted 11 experts (8 instructors working in the nutrition and dietetics departments of different universities and 3 executive dietitians working in the food services of different hospitals) for feedback on the first version of our questionnaire. We also carried out a pilot study of fifty patients to examine face and content validity

and test the comprehensibility and feasibility of the questionnaire. In an open-ended question at the end of the questionnaire, patients were asked to provide their supplementary comments or mention the important issues missed in the questionnaire. The content validity was examined to determine whether the scale was suitable for the desired property and whether the measurement data really reflected the desired feature. Construct validity of the scale was analyzed. The contents of the items were taken into consideration and the subscales were named. The internal consistency (reliability) level of the items and the Cronbach's Alpha internal consistency coefficients were examined. The details of the validity and reliability analyzes are provided in the findings.

Study Participants

The validity and reliability of Food Services Satisfaction Scale for Inpatients (FSSSI) was carried out on patients with a hospitalization period of at least 3 days in a medical faculty hospital and a private hospital in Konya between February and April 2017. The first step of the study was based on the number of items of the scale. Although the related literature recommends different sample sizes for methodological researches to improve the scale, a sample size which is 5-10 times higher than the number of items is generally recommended. Since the number of items was 30, the number of inpatients was determined to be 240. These patients were determined by random sampling method. Data collection time for each patient took approximately 10 minutes. The research data were collected by the researcher by face-to-face interview method.

The study included voluntary patients aged between 18 and 65 years, who were hospitalized for at least three days, benefited from food services, and did not have a communication disability. Patients with cognitive disorders, patients hospitalized in psychiatry, oncology, pediatrics and intensive care units, and patients taking only enteral and parenteral nutrition or only liquid diet were not included in the study.

Statistical Analysis

The data were analyzed using the Statistical Package for Social Science (SPSS) 17.0. In order

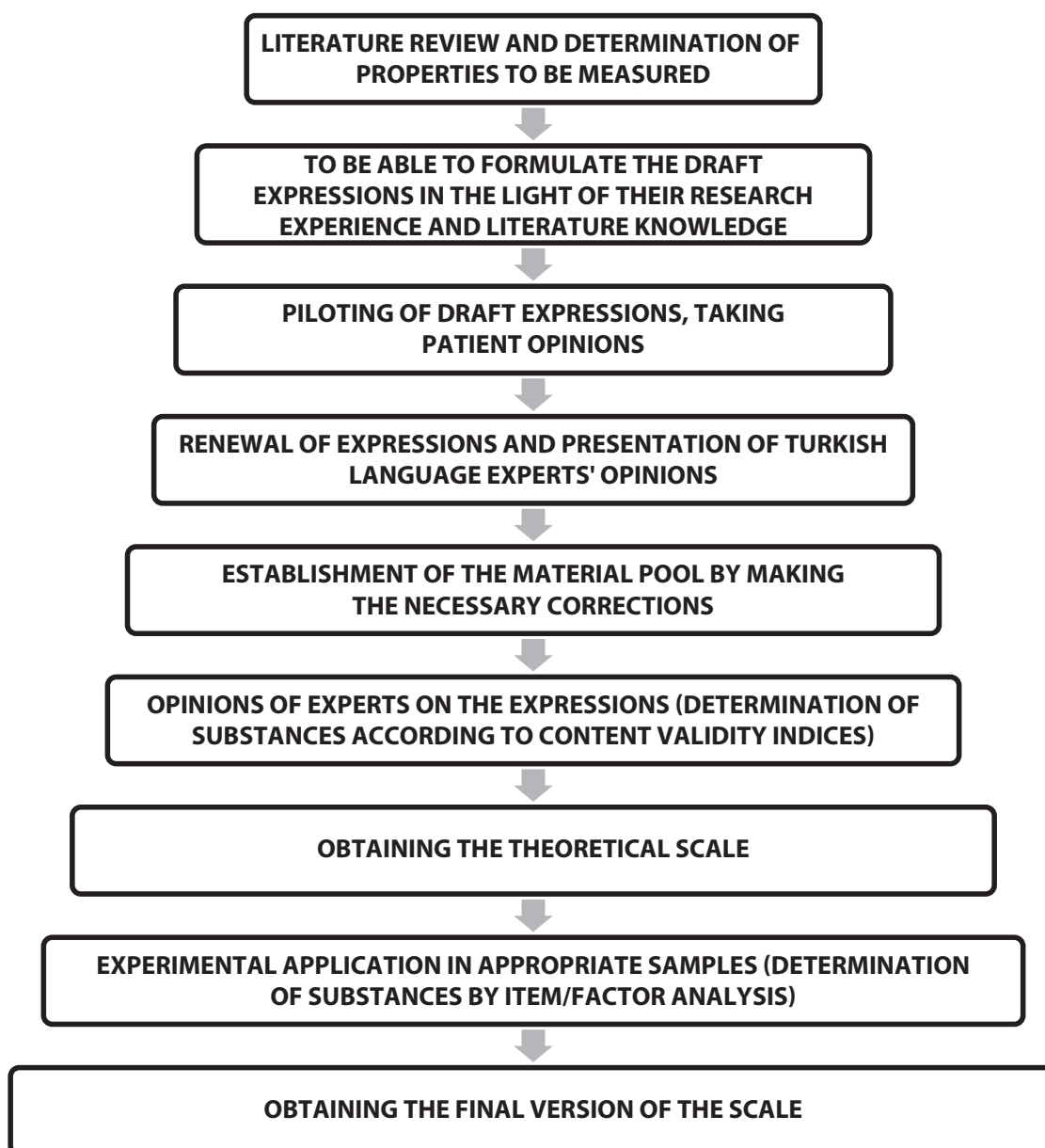


Figure 1. The steps of FSSSI development

to examine the adequacy of the sample size, the Kaiser-Meyer-Olkin test and Bartlett test were used to examine the factorizability. In order to examine the construct validity of the scale, exploratory factor analysis was conducted using varimax rotation. Then, the items were selected and the final scale was formed after the subscales of the scale were formed based on the results of the factor analysis. The Cronbach's Alpha coefficient was determined to identify the internal consistency of the scale.

Results

Content Validity

For the content validity, 8 instructors working in the Nutrition and Dietetics Departments of different universities and 3 dietitians working in the food services of different hospitals were presented to the experts by e-mail. The content validity was calculated using the Lawshe's method for each item to evaluate

experts' responses. The minimum value for the content validity was 0.59 for 11 experts. Considering the value for the content validity for the items, two out of 32 items with a content validity under 0.59 were excluded from the scale. Furthermore, some corrections were made in line with the suggestions of the experts.

Construct Validity

Construct validity of the remaining 30 items in the draft scale was analyzed. The Kaiser Meyer Olkin (KMO) value of the scale was 0.855 and the result of the Barlett test was 2515,785 ($p < 0.000$). The KMO value was > 0.60 and the Barlett test was significant, indicating that the scale was suitable for factor analysis. When the factor analysis results were

examined, 5 items with a factor load value below 0.45 were excluded from the scale. The factor loadings of the items ranged between 0.803 and 0.552 in the first subscale (food quality), 0.795-0.503 in the second subscale (menu quality), 0.840-0.505 in the third subscale (meal service quality), 0.674-0.654 in the fourth subscale (personnel service quality), 0.829-0.654 in the fifth subscale (environment quality), and 0.890-0.806 in the sixth subscale (dietician interest) (Table 1). The final scale consisted of 25 items (Appendix A).

Table 2 shows eigenvalues of the subscales obtained from the factor analysis and the variance ratio. The total variance explained by the scale was determined as 67.2% and it is considered as adequate (Table 2).

Table 1. Factor loads for items included in the subscale of the FSSSI (n = 240)

Item Number	Factor Loads					
	Food quality	Menu quality	Meal services quality	Personnel service quality	Environment quality	Dietician interest
Item 01	0,639					
Item 02		0,795				
Item 03	0,803					
Item 04			0,840			
Item 05	0,552					
Item 06			0,505			
Item 07		0,605				
Item 08		0,559				
Item 09	0,728					
Item 10	0,754					
Item 11	0,623					
Item 12		0,519				
Item 13		0,627				
Item 14	0,693					
Item 15			0,756			
Item 16			0,737			
Item 17			0,537			
Item 18				0,674		
Item 19		0,566				
Item 20					0,654	
Item 21				0,654		
Item 22					0,829	

Item Number	Factor Loads					
	Food quality	Menu quality	Meal services quality	Personnel service quality	Environment quality	Dietician interest
Item 23						0,890
Item 24						0,806
Item 25		0,503				

In addition, the subscales were determined by using scree plot of the factors. The subscales were named considering the contents of the items. Four items (item 5, 11, 15, and 20) are negative sentences.

Table 2. Variance rates explained by the subscales of the FSSSI (n=240)

FSSSI subscales	Eigenvalue	Variance (%)	Cumulative (%)
Food quality	9,259	37,036	37,036
Menu quality	2,141	8,566	45,602
Meal services quality	1,603	6,410	52,012
Personnel service quality	1,336	5,343	57,355
Environment quality	1,320	5,280	62,635
Dietician interest	1,150	4,599	67,234

Table 3. Internal consistency coefficients for the subscales of the FSSSI (n=240)

FSSSI subscales	Internal consistency coefficients (Cronbach's Alpha)
Food quality	0,71
Menu quality	0,81
Meal services quality	0,71
Personnel service quality	0,71
Environment quality	0,74
Dietician interest	0,84

Reliability

The Cronbach's Alpha coefficient was found to be 0.92 for the reliability of the developed scale, which shows that the scale has a high reliability coefficient.

The reliability values of the subscales of the scale were determined using the Cronbach's Alpha internal consistency coefficient. The Cronbach's Alpha values of dietician interest, menu quality, environment quality, food quality, personnel service quality and food service quality were found to be 0.84, 0.81, 0.74, 0.71, 0.71 and 0.71, respectively (Table 3).

Considering the correlation between the total score of the FSSSI and the scores of the subscales, all the subscale scores have a positive correlation with the

Table 4. Correlation results between the total score of the scale and the subscale scores (n = 240)

FSSSI subscales	FSSSI total score	
	R	p
Food quality	0.85	0.00
Menu quality	0.82	0.00
Meal services quality	0.66	0.00
Dietician interest	0.52	0.00
Environment quality	0.42	0.00
Personnel service quality	0.37	0.00

Pearson correlation test; $p < 0.05$

total satisfaction scores. From the highest to lowest; food quality, menu quality, meal services quality, dietician interest, environment quality and personnel service quality, respectively are listed in Table 4.

Discussions

The findings of this study are valid and reliable. The Cronbach's Alpha coefficient values for the scale developed in the study were found to be higher compared to other studies. The Cronbach's Alpha coefficient of Acute Care Hospital Foodservice Patient

Satisfaction Questionnaire (ACHFPSQ) developed by Capra et al. (13) was 0.89. ACHFPSQ scale was adapted to Turkish and the Cronbach's Alpha coefficient was found to be 0.74 for the reliability analysis performed for Turkey (17). In another study conducted to determine the satisfaction of hospital food services in Pakistan, the Cronbach's Alpha coefficient was found to be 0.86 (18). Also The translated version in Urdu ACHFPSQ was pretested and the reliability of the translated scale was 0.77 (19).

Examination of the reliability values ACHFPSQ showed that the food quality was 0.89, food service quality was 0.72, personnel/service subject was 0.65, and physical environment was 0.61 (13). In another study, the Wesley Hospital Food Service Patient Satisfaction Scale (WHFPSQ) and Parkside Inpatient Patient Scale (PIQ) were administered together to the same patients. Based on the results, the safety value of WHFPSQ food quality subscale was 0.88, whereas this value for PIQ was found to be 0.52 (20). ACHFPSQ scale was adapted to Turkish showed that the food quality was 0.73, food service quality was 0.74, personnel/service subject was 0.72, the amount of hunger was 0.76, and environment factors was 0.68 (17). The number of subscales used in this study and the number of subscales used in the other studies as well as their different names make it difficult to make comparisons between the subscales. However, the environment quality dimension coefficient in our study was found to be higher than other studies.

The highest correlation in this study was found for the food quality ($r = 0.85$). Based on the results of our study, which is supported by the results of many previous studies, the food quality best described the satisfaction with hospital food services (13, 21-23). According to Lau and George (22), the most important target subscale for improving patients' satisfaction with food service is food quality. Fallon et al. (24) also reported that it is more difficult to control the food quality subscale than the other subscales including physical characteristics, interpersonal relationships and staff training. The correlation between the food quality subscale and the high quality of the food industry is higher than the other expressions in FSSSI and other studies (13,21).

Conclusion

It is a fundamental right for patients to have quality food services. Although hospital food service is generally less appreciated than other clinical services, patient meals are an integral part of hospital treatment. Also, dietary treatment is of great importance to help recovery. The more the patients' expectations are met, the more satisfied they leave hospitals. Hospitals and health care institutions need an accurate, responsible and established system for improving the quality of hospital food services to ensure healthy and delicious food with high consumability.

In this study, the FSSSI which consists of 25 items and 6 subscales has been developed. The use of this scale may allow easy and rapid measurement of satisfaction with the food services of the patients and provide the necessary improvement activities by revealing the non-conformities of the food services and the aspects that need to be improved. In addition, due to its subscales, field-specific deficiencies can be determined more easily. Moreover, the most important criterion in evaluating the services of catering contractors in the rapidly increasing city hospitals is to evaluate the satisfaction of the patients. This tool is believed to provide important data for the inspection of catering companies in hospitals and for the elimination of service shortages.

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Conflict of interests: The authors declare that they have no conflict of interest.

References

1. González N, Quintana JM, Bilbao A, et al. Development and validation of an in-patient satisfaction questionnaire. *Int J Qual Health Care.* 2005;17(6):465-472.
2. Ware JE Jr, Snyder MK, Wright WR, Davies AR. Defining and measuring patient satisfaction with medical care. *Eval Program Plann.* 1983;6(3-4):247-263.

3. Hemadeh R, Hammoud R, Kdouh O, Jaber T, Ammar L. Patient satisfaction with primary healthcare services in Lebanon. *The International Journal of Health Planning and Management*. 2019;34(1):423-435.
4. Dall'Oglio I, Nicolò R, Di Ciommo V, et al. A systematic review of hospital foodservice patient satisfaction studies. *J Acad Nutr Diet*. 2015;115(4):567-584.
5. Barr JK, Giannotti TE, Sofaer S, Duquette CE, Waters WJ, Petrillo MK. Using public reports of patient satisfaction for hospital quality improvement. *Health Serv Res*. 2006;41(3 Pt 1):663-682.
6. Dijkhoorn DN, Mortier M, van den Berg MGA, Wanten GJA. The currently available literature on inpatient foodservices: sys-tematic review and critical appraisal. *J Acad Nutr Diet*. 2019;119(7):18-41.
7. Yona O, Goldsmith R, Endevelt R. Improved meals service and reduced food waste and costs in medical institutions resulting from employment of a food service dietitian – a case study. *Israel Journal of Health Policy Research*. 2020;9:5.
8. Aminuddin NF, Vijayakumaran RK, Abdul Razak S. Patient satisfaction with hospital foodservice and its impact on plate waste in public hospitals in East Malaysia. *Hospital Practices and Research*, 2018;3(3):90-97.
9. Azeman AR, Adenan H, Ripin A. Patient's satisfaction towards private hospital's foodservice in Melaka. *Journal of Hospitality and Networks*. 2018(1): 32-36.
10. Hartwell HJ, Edwards JSA, Symonds C. Foodservice in hospital: development of a theoretical model for patient experience and satisfaction using one hospital in the UK National Health Service as a case study. *Journal of Foodservice*. 2006;17(5-6), 226-238.
11. Tengilmoglu D, Kisa A, Dziegielewski SF. Patient satisfaction in Turkey: differences between public and private hospitals. *J Community Health*. 1999;24(1):73-91.
12. Sahin B, Yilmaz F, Lee KH. Factors affecting inpatient satisfaction: structural equation modeling. *J Med Syst*. 2007;31(1):9-16.
13. Capra S, Wright O, Sardie M, Bauer J, Askew D. The acute hospital foodservice patient satisfaction questionnaire: the development of a valid and reliable tool to measure patient satisfaction with acute care hospital foodservices. *Foodservice Research International*. 2005;16(1), 1-14.
14. Sahin B, Demir C, Celik Y, Teke AK. Factors affecting satisfaction level with the food services in a military hospital. *J Med Syst*. 2006;30(5):381-387.
15. Wright OR, Connelly LB, Capra S. Consumer evaluation of hospital foodservice quality: an empirical investigation. *Int J Health Care Qual Assur Inc Leadersh Health Serv*. 2006;19(2-3):181-194.
16. Abdelhafez A M, Al Qurashi L, Al Ziyadi R, Kuwair A, Shobki M, Mograbi H. Analysis of factors affecting the satisfaction levels of patients toward food services at General Hospitals in Makkah, Saudi Arabia. *American Journal of Medicine and Medical Sciences*. 2012; 2(6), 123-130.
17. Ercan G, Akçil Ok M. Validity and reliability study of Turkish form of hospital food services patient satisfaction scale. *Türkiye Klinikleri J Health Sci*, 2018; 3(3):187-194.
18. Zahid M, Zaidi SK, Naqvi S, Iqbal S, Maqsood B, Iqbal A. Survey of patients' perception of hospital food services at afic-nihd rawalpindi. *Pak Armed Forces Med J*, 2015;65(Suppl), 102-5.
19. Sadaf S, Malik AA, Bilal A, Saeed A. Patient Satisfaction Regarding Food and Nutrition Care in Hospitals of Lahore, Pakistan. *Progr Nutr*. 2018;20(2-S):248-56.
20. Wright O, Capra S, Aliakbari J. A comparison of two measures of hospital foodservice satisfaction. *Aust Health Rev*. 2003;26(1):70-75.
21. Dubé L, Trudeau E, Bélanger MC. Determining the complexity of patient satisfaction with foodservices. *J Am Diet Assoc*. 1994;94(4):394-400.
22. Lau C, Gregoire MB. Quality ratings of a hospital foodservice department by inpatients and postdischarge patients. *J Am Diet Assoc*. 1998 Nov;98(11):1303-1307.
23. McLymont V, Cox S, Stell F. Improving patient meal satisfaction with room service meal delivery. *J Nurs Care Qual*. 2003;18(1):27-37.
24. Fallon A, Gurr S, Hannan-Jones M, Bauer JD. Use of the Acute Care Hospital Foodservice Patient Satisfaction Questionnaire to monitor trends in patient satisfaction with foodservice at an acute care private hospital. *Nutr Diet*. 2008;65(1):41-46.

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Appendix A. The final scale of FSSSI

	Always	Often	Sometimes	Rarely	Never
Items of Food Services Satisfaction Scale for Inpatients (FSSSI)					
1. The taste/flavor of the hospital food is good.					
2. The variety of meals in the menu in terms of color, texture and taste has been provided.					
3. The meals are cooked well enough.					
4. Hot meals are served hot enough.					
5. The meats are hard and not cooked well.					
6. The appearance of the food is beautiful and appetizing.					
7. The consistency of the meals in the menu is suitable for my consumption.					
8. The portion size of the meals on the menu is sufficient for me.					
9. Salads are well washed.					
10. Fruits are well washed.					
11. The fruits are rotten and / or crushed.					
12. The variety of meat meals is sufficient.					
13. The variety of soups is sufficient.					
14. The taste of the soups is good.					
15. The food tray, plates, spoons or forks are broken / cracked or worn.					
16. Cleaning of food trays, dishes, spoons or forks is appropriate.					
17. Meals are served on time.					
18. The staff serving my meals are uniformed and clean.					
19. Food in the hospital is healthy for me.					
20. I'm disturbed by the noise during and after the food					
21. The staff serving my meals are friendly and respectful.					
22. My room / the place where I eat is suitable for my food consumption.					
23. Dieticians/Nutritionists are polite and respectful.					
24. Dieticians/Nutritionists are concerned with my nutritional status.					
25. The meals in the menus are suitable for my general eating habits.					