



Original Research Article

## **Anthropometric Assessment and Patient Satisfaction with Hospital Meals in County Referral Hospitals of Western Kenya**

Brenda Ahoya<sup>1</sup>, Jane Situma<sup>2</sup>

<sup>1</sup>Ministry of Health, County Nutrition Coordinator, Vihiga County

<sup>2</sup>Lecturer, Masinde Muliro University of Science and Technology, Kenya.

Corresponding Author: Brenda Ahoya

Received: 04/05/2015

Revised: 22/05/2015

Accepted: 30/06/2015

### **ABSTRACT**

Hospital diets are prepared with the aim of providing nutritional requirements of patients. Establishing patient satisfaction with the diet provided is key in ensuring that nutrition requirements of the patients are met. The study aimed at establishing anthropometric assessment for in patients, patient satisfaction with hospital meals and determines factors that influence satisfaction in referral hospitals of Western Kenya. A four part questionnaire was used to collect data. Data was analyzed using SPSS Version 17 and presented using percentages, frequency distribution and tables. Anthropometric assessment was done for 70.4% of the in patients. Most of the clients interviewed liked the hospital meals in terms of temperature, appearance, freshness, texture, taste, variety, portion size and aroma. Education and sex influenced patient satisfaction. The hospital meals provided in the referral hospitals in Western Kenya were satisfactory to the patients needs.

**Key words:** Patient satisfaction, Anthropometric assessment, Hospital meals

### **INTRODUCTION**

Food is an important part of caring for hospitalized patients and an essential component in quality disease management.

<sup>[1]</sup> Providing meals is an essential part of treating patients. <sup>[1]</sup> Hospital dietary departments therefore provide different types of meals that, with limited resources, meet the various nutritional requirements of patients. Consequently, diet manuals are used in hospitals to standardize nutrition management and to help dietary departments perform in an economical and efficient way. <sup>[2]</sup>

It is important to evaluate patient views to ensure patient satisfaction with

food served. <sup>[3]</sup> Studies on patient satisfaction are a means of evaluating hospital performance from the views of patients. <sup>[4]</sup> The Constitution of Kenya <sup>[5]</sup> states that all patients have a right to safe, adequate and acceptable food. Patients expect their nutritional needs to be fulfilled during hospitalization as they depend on ordinary hospital food to improve or maintain their nutritional status in order to optimize their recovery from illness. <sup>[4]</sup> However, Nutritional management is frequently complicated by variability in appetite due to the underlying illness, limitations in food selections, and poor coordination. <sup>[6]</sup>

Patient Satisfaction is the combination of experiences, expectations and needs perceived by an individual; [7] the essential indicator that reflects service quality at any level of health services. [4] The perception of food quality depends on different attributes [8] as in-patients evaluate based on taste, nutrition, sanitation, temperature, portion size, meal time, and servers' attitudes. [2] In assessing patient satisfaction, foodservice satisfaction often goes unnoticed, as nursing and physician quality and quality of technical medical care take precedence. [9] Efficient delivery of proper, quality diet to each type of patient results in great satisfaction of patients and their caretakers. [1] Patient satisfaction and perspective on quality of care are important for monitoring health care performance of health plans. The in-patient food services influences patient's perception of both satisfaction and quality of care because feeding is an indicator of progress towards recovery. [1] The study aimed to; determine proportion of anthropometric assessment and counseling, level of patient satisfaction and establish factors that influence patient satisfaction.

## **MATERIALS AND METHODS**

The study was conducted among in patients in the county referral hospitals of Vihiga, Busia, Kakamega and Bungoma counties in Western Kenya. Questionnaires were developed and pre tested. The questionnaire was divided into 4 parts: Part (1) general information (2) socio demographic characteristics (3) anthropometric assessment and twenty hour recall (4) patient satisfaction. Patients admitted on the preceding day or actual day of the interview, including those with notable physical, cognitive, or emotional limitations as determined by the in charge were excluded from the study. Those either literate or semi literate, visually or

physically impaired were assisted to complete the questionnaire. Responses to questions on satisfaction were coded on a scale of 1-5 representing the Likhert Scale (1=extremely dislike, 2=dislike, 3=neither like nor dislike, 4=like, 5=extremely like). Study limitation was that patients were surveyed anytime from the second day of their hospital stay and there was a possibility that their opinion over satisfaction may have changed after a longer hospital stay.

## **Statistical Methods**

Data were analyzed by using Statistical Package for Social Science (SPSS) version 17.0. Results were considered significant at 0.05.

## **RESULTS**

### *Demographic characteristics*

The proportion of patients from the county hospitals who participated in the study were: Bungoma County Referral Hospital (BGM CRH) (31) 23.5%, Busia County Referral Hospital (BSA CRH) (35) 26.5%, Kakamega County Referral Hospital (KCRH) (32) 24.2% and Vihiga County Referral Hospital (VCRH) (34) 25.8%. Though it was not set in the design, the proportion of males to females in the study was (n=66) 50% males and (n=66) 50% females; BGM CRH 51.6% (16) females and 48.4% (n=15) males, BSA CRH (17) 48.6% females and (18) 51.4% males, VCRH (19) 55.9% females and (15) 44.1% males and KCRH females (14) 43.8% and males (18) 56.3%. Patients ages varied with the youngest being eight months old and the oldest 88 years. The mean age was 35.1 years. Means of living for patients were small scale business 22.7% (30), farmers 21.2% (28), casual laborers 18.2% (24), housewives 14.4% (19), those below 18years of age 12.1% (16), teachers 5.3% (7), unemployed 3.8% (5), religious leaders 1.5% (2) and students 0.8% (1). Frequency

distribution of patients medical conditions were: General conditions 36.5% (46), Diabetes 15.9% (20), Hypertension 11.9% (15), Burns 9.5% (12), Severe Acute Malnutrition 9.5% (12), AIDS 7.1% (9), Anemia 4% (5), Acute glomerulo-nephritis 1.6% (2), Oesophageal cancer 1.6% (2), Cellulitis 0.8% (1), Gastro enteritis 0.8% (1) and Oedema 0.8% (1).

#### *Anthropometric assessment and counseling*

Overall in the study, anthropometric assessment was done for 70.4% (88) of the in patients. However, among facilities; BGM CRH 90.3% (28), KCRH Hospital 72% (18), VCRH 70.6% (24) and BSA CRH 51.4% (18). Of the anthropometric assessments done, 65.1% (28) were by nutritionists, 30.2% (13) other health staff and 4.7% (2) by students. The assessments were; BMI 58.7% (44), Weight only 18.7% (14), Z score and MUAC 9.3% (7), BMI and MUAC 8% (6), MUAC only 4% (3), MUAC and weight 1.3% (1). The kind of anthropometric assessment done was influenced by the health facility with a  $X^2_{cal}$  of 122.148 against a tabulated value of  $X^2_{tab}$  of 36.415 .

The overall proportion of those counseled was 54.5% (72), while per facility was BSA CRH 61.3% (19), BSDH 48.6% (17), KCRH 53.1% (17), VCRH 55.9% (19). Counseling for the various conditions were; Oesophageal Cancer 100% (2), Cellulitis 100% (1), Gastro Enteritis 100% (1), Oedema 100% (1), Diabetes 90% (18), Burns 75% (9), Hypertension 60% (9), SAM 50% (6), Anemia 40% (2), AIDS 44.4% (4), General Conditions 37% (17), while no counseling was done for Acute glomerulo-nephritis. For those whom anthropometric assessment was done 61.4% (54) were counseled while those whom anthropometric assessment was not done 32.4% (12) were counseled.

#### *Therapeutic diets*

In the overall study, 47% (62) of the patients were on normal/standard diet, 19% (26) high protein, 11.4% (15) low sodium, 10.6% (14) diabetic, 3% (4) therapeutic for SAM, 4.5% (6) Liquid diet, 2.3% (3) high protein high calorie and 0.8% (1) each for *toto* and soft diets. In BSA CRH 48.4% (15) were on normal diet, 22.6% (7) low sodium, 19.4% (6) diabetic, 6.5% (2) high protein, 3.2% (1) high protein high calorie; BGM CRH 60% (21) high protein, 31.4% (11) normal and 8.6% (3) low sodium diet; KCRH 71.9% (23) normal diet, 9.4% (3) and 6.3% (2) for liquid, high protein, and therapeutic for SAM separately; VCRH 38.2% (13) normal, 17.6% (6) diabetic, 14.7% (5) low sodium, 8.8% (3) liquid, 5.9% (2) high protein high calorie and therapeutic for SAM, 2.9% (1) *toto*, soft and high protein diets. These diets varied significantly from facility to facility  $p=0.005$ .

#### *Patient Satisfaction with Hospital Menu*

In the overall study 60.8% (79) reported that they liked the variety served while 23.1% (30) did not, 14.6% (19) neither liked nor disliked, and 1.5% (2) extremely liked the variety. There were variations among facilities: In BGM CRH (20) 64.5% liked the variety, (10) 32.3% did not like and (1) 3.2% neither liked nor disliked. It is important to note that in BSA CRH 29.4%, almost twice of the average value reported neither liking nor disliking, a trend similar to KCRH. In VCRH, and BGM CRH, no patient reported extremely liking the variety ( $p=0.007$ ).

Overall 68.7% (90) of the respondents reported liking the taste of food served, 1.5% (2) extremely liked the taste. BSA CRH reported 0% on disliking the taste while in VCRH 17.6% (6) and 19.4% (6) in BGM CRH reported the same ( $p=0.028$ ).

Overall, 78% (103) liked the texture of the food. In BSA CRH 100% (35) of the patients liked the texture; in BGM CRH and

VCRH, 16.1% (5) and 14.7% (5) disliked the texture ( $p=0.001$ ).

The temperature of food served was 93.2% (123) liked by all respondents. KCRH reported 100% (32) liking. There was zero reporting for neither liking nor disliking temperature for VCRH and BGM CRH ( $p=0.118$ ).

Concerning freshness of food, 81.8% (108) liked, while only in BSA CRH did 2.9% (1) respondent report extremely liking the freshness. Considerable percentage 34.3% (12) of the respondents reported neither liking nor disliking the freshness of food ( $p=0.004$ ).

In the overall study 58.8% (77) of the respondents liked the aroma, 23.7% (31) neither liked nor disliked, 13.7% (18) did not like while 1.5% (2) and 2.3% (3) strongly disliked and strongly liked the aroma respectively. However among individual facilities, BSA CRH at 71.4 % (25) had the most likes for aroma, while BGM CRH and KCRH had 0% strong dislike for aroma and VCRH and BGM CRH also had 0% strong likes for aroma. There was a high number among facilities neither liking nor disliking the aroma; BGM CRH 22.6% (7), BSA CRH 17.1% (6), KCRH 37.5% (12) and VCRH 18.2% (6). Highest dislikes for aroma were noted in BGM CRH 22.6% (7) and VCRH 24.2% (8) ( $p=0.71$ ).

In the overall study, 41.5% (54) of the respondents liked the appearance of the food, 30.8% (40) neither liked nor disliked the appearance, 24.6% (32) disliked the appearance and 3.1% (4) strongly disliked the appearance. The highest proportions of those disliking appearance were in BGM CRH 45.2% (14) and VCRH 39.4% (13). In BSA CRH 45.7% (16) and KCRH 48.4% (15) liked the appearance. Strong dislike of appearance was 0% for BSA CRH and KCRH hospitals ( $p<0.000$ ).

In the overall study, 45.5% (59) of the respondents liked the service time, 28.5% (37) did not like, and 10% (13) strongly disliked the service time. Only one patient (0.8%) strongly liked the service time. The trends among health facilities were different. 45.5% (15) of the patients in VCRH and 43.3% (13) in BGM CRH did not like the service time. In KCRH 71.9% (23) of the patients liked the service time ( $p<0.000$ ).

In the overall study, 26.5% (35) neither liked nor disliked the service style, 39.4% (52) liked, 22.7% (30) did not and 11.4% (15) strongly disliked the service style. There were major differences among facilities with 22.6% (7) patients in BGM CRH and 20.6% (7) in VCRH strongly disliking and 32.3% (10) in BGM CRH and 32.4% (11) in VCRH disliking the service style ( $p<0.000$ ).

In the overall study, a similar number 34.8% (46) liked and disliked the presentation while 28.8% (38) neither liked nor disliked. Two patients (1.5%) strongly disliked the presentation.

In BGM CRH 48.4% (15) liked, 41.9% (13) disliked and 3.2% (1) strongly disliked while in VCRH 41.2% (14) disliked and 47.1% (16) liked the presentation; In BSA CRH 45.7% (16) disliked and 51.4% (3) neither liked nor disliked. In KCRH 46.9% (15) neither liked nor disliked and 43.8% (14) liked the presentation ( $p<0.000$ ).

In the overall study 51.1% (67) liked the portion size, 9.2% (12) strongly disliked, and 17.6% (23) disliked the portion size. Only 3.1% (4) strongly liked the portion size. The differences among facilities were as follows: In KCRH 75% (24) liked the portion size and there were no dislikes for portion sizes. The situation In BGM CRH and VCRH was almost similar ; 41.9% (13) VCRH and 41.2% (14) BGM CRH liked the portion size , 17.6% (6) in VCRH and 16.1% (5) in BGM CRH strongly disliked

and 29.4% (10) in VCRH and 29% (9) in BGM CRH disliking the portion sizes ( $p < 0.000$ ).

Twenty five percent (33) of the patients failed to consume hospital meals at some point during their stay. The proportion of those consuming food other than what was provided in the hospital was highest in KCRH 40.6% (13), lowest in BSA CRH 2.9% (1), while BGM CRH and VCRH were 29% (9) and 29.4% respectively.

## DISCUSSION

### *Anthropometric assessment*

In the study 70.4% of the patients had their anthropometric assessment done and this was lowest in BSA CRH at 51.4% resulting in missed opportunities to offer interventions like in Malnutrition cases. Malnutrition remains undiagnosed in 70% of patients admitted to hospital and 70–80% of the admitted malnourished patients enter and leave the hospital without receiving any nutritional support and the diagnosis of malnutrition does not appear on their discharge. [10] A number of clients did not have their anthropometric assessment done and among those with nutrition related conditions, not all were counseled. Those not counseled were Anemia 60%, AIDS 55.6%, SAM 50%, Hypertension 40%, Burns 25% and Diabetes 10%. Not counseling a client with a nutrition related condition as noted, leads to poor prognosis. Total in patients counseled were 54.5%; attributed to staff shortage across all cadres. There was a shortage of nutritionists in the hospitals, with a total of either one or two nutritionists employed in the county referral hospitals. Elsewhere, low levels of service is attributed to lack of workers and untrained employees. [11] There were cases where though no anthropometrical assessment was done, the patient was still counseled. These were attributed to patients with burns or

with a previous or current nutrition diagnosis like diabetes, anemia where general counseling on what foods to avoid or increase intake was done. The clients most overlooked were those admitted with general conditions. Only 17% of patients with general conditions were counseled. Some of these patients were admitted with general conditions but had underlying nutrition related conditions, prompting the counseling. An example is a patient who is a known diabetic but was admitted due to Malaria.

### *Patient Satisfaction with Hospital meals*

The perception of food quality depends on several different attributes, including meal taste, variety, flavor, texture, and the perception of choosing a healthy meal. [8]

The general perception has been that hospital meals from government facilities were generally of a poor quality. However, this study proved otherwise as patient satisfaction was higher than expected. Other studies found high patient satisfaction ratings for hospital foodservice that seemed inconsistent with the reports; [12] over 70% patients' satisfaction with food services in quality and quantity and the manner in which the food was served to them, [4] 52% satisfied with the hospital meals, [13] in Taif, Saudi Arabia, a very high level of satisfaction with the quality of the meal, timeliness of the meal service, [11] 78.8% satisfied overall with the quality of food services. [14]

This high level of patient satisfaction is attributed to the type of patients who attend government health facilities. Those with a higher economic potential and higher level of education acquire private medical insurance and visit private hospitals. The clients attended to in these government health facilities are mostly the poor who are sometimes waived due to inability to pay and those with national insurance. Most

clients would thus be satisfied with getting three meals a day with snacks in between. This high level of satisfaction is also attributed to the fact that food does not have to be of a high quality for the patient to be satisfied, as satisfaction is a comparison between an expectation and a reality or experience. [15] Patients may expect the food to be very poor, and as a result will be inclined to rate 'ordinary' food well. Patients also tend to overinflate their satisfaction depending on any number of methodological influences. [16]

Patient satisfaction is enhanced by choice at the point of consumption. [17] In this study, over 27.7% disliked the appearance with 30.8% neither liking nor disliking, 38.5% did not like the service time, 34.6% disliked the service style and 34.8% disliked the presentation. In some cases, the lack of satisfaction led to the patient not consuming the hospital meals. The reasons given were: the food had an unpleasant taste and aroma, food was too oily, milk tea was too dilute, patient preferred other foods, better food was brought from home and patients dislike for the particular food served. The service style and presentation in this study is unlike those in other studies. Food is carried in stainless steel buckets from the kitchen to a central point in each ward. Patients who or their caretakers then move from their beds, carry their utensils and queue to be served. There were no specific measures used to determine portion sizes.

Elsewhere, 92% and 90.8% patients were unsatisfied with unavailability of a place to health or cool food respectively. [14] Patient un-satisfaction in various studies regarding quality of food was 48.1%, [18] 56.75%, [19] and 46%. [13] These low ratings were attributed to lack of variety, less quantity and tasteless food. Low ratings are attributed to improved socio economic status and easier access to medical care leading to

high expectations and demand from consumers of hospital services; [20] gaps in quality and menus not reflecting patients' preference, inconsistency of food quality, a lack of menu variety, and improper food temperatures. [2]

Twenty six point nine percent of the patients in the current study did not like the portion size. In another study, staff did not conform to specified portion sizes therefore needing training on importance of portion control and how to comply with portion sizes including provision of proper equipment and tools. [2]

#### *Determinants of satisfaction*

At Saint-Vincent Pavilion, all aspects of foodservices (except quantity) were significantly correlated with overall satisfaction. Satisfaction with presentation of meal was the best predictor of overall satisfaction. [21] Temperature and texture were the most important attributes which determined patient satisfaction. [17, 2]

As per the findings of this study, age did not influence patient satisfaction. However, gender influenced various aspects of patients' satisfaction. Women were 0.3 times less likely to like the variety than men  $p=0.003$ , men were 0.1 times less likely to dislike texture than women  $p=0.002$ , women were 0.8 times less likely to dislike portion size than men  $p=0.018$ , women were twice more likely to dislike appearance than men  $p=0.035$ . A significant association was found between age, gender and patient satisfaction as more number of males is satisfied with the hospital services in comparison to the females. [4]

The level of education in this study was also found to influence patient satisfaction. The proportion of those liking variety decreased by 0.7 times as the level of education increased  $p=0.004$ . The proportion of those disliking the aroma increased by 4.1 times with the level of education  $p=0.023$ . The proportion of those

disliking the service time increases with the level of education  $p < 0.000$ . Those disliking the style of service increased by 0.8 times as the level of education increased  $p = 0.026$ . Those with no education were also 0.1 times more likely to like the presentation than those with tertiary education  $p = 0.001$ . Patient's knowledge, past experiences with clinical nutrition services, perceived need for nutrition care, and the quality of the food service influence satisfaction nutrition services. [3] Low monthly income, taste and temperature of food, attitude of staff serving food, and absence of disturbance inside and/or outside the room were statistically significant independent variables related to patient satisfaction with hospital meals and food services. [14] There is a significant relationship with food-quality ratings with patients who stay in the hospital for long [9] though this was not assessed in this study. However, portion size did not influence satisfaction. [17, 2]

Only two out of the four facilities had a cateress. None of the facilities had a diet kitchen. Equipment needed for preparation of special diets was not available. There are no standard portion size containers in any of the kitchens. All food is prepared once. The kitchen staff are overwhelmed as they prepare both staff and in patients meals. Menus were available. However, the menus were not implemented to the letter and sometimes adjustments were made using what was readily available or affordable. All the above led to improvisation at facility level. Based on the 24 hour recall, none of the hospitals gave fruits to their patients. The only patients who ate fruits are those who purchased theirs privately. The lack of adherence to the menu was attributed to inadequate funds. There is therefore need to sensitize managers at higher levels on the importance of quality in-patient feeding.

Food services that satisfy patient needs decrease food wastage, and increases savings. [22] However, in this study, overall 25% of the patients failed to consume hospital meals or in addition to hospital meals consumed their own provisions; highest in KCRH at 40.6% and lowest in BSA CRH at 2.9%. Reasons given for failing to consume hospital diet were: food not appealing 48.5% (17), own preference 28.6% (10), medical reasons 20% (7), not suitable for their disease condition 2.9% (1). One third of the patients consume only 50% of hospital meals and as a result, nutritional requirements of a significant amount of patients are not met and malnutrition problems occur; [23] 29.6% of patients are not depending on hospital diet. [14] Patients need to understand the importance of consuming the provided meals. [2]

Food from outside the hospital is not encouraged. However, for those who consumed other foods other than what was provided in the hospital, the preferred foods were: Fruits 23.8%, Bread 22.6%, Milk 20.6%, Soda 9.6%, Juices 6.7%, Cakes 4.2%, Fresh fruit juice 3.3%, Tea or Cocoa 2.5%, Traditional vegetables 2.5%, *Ugali* 2.1%, Brown rice, chicken, French fries and Weetabix 0.4%. This list shows knowledge gap as some of these foods provide empty calories. Some of these foods were consumed by patients of SAM and one diabetic consumed a soda. Nutrition education and counseling to patients is important to ensure that patients understand their condition and are managing it appropriately as per the guidelines. Patients need to understand the importance of consuming the provided meals. [2]

Overall counseling for patients in this study was 54.5%. Lack of counseling for patients with the above conditions could be detrimental to the overall management as their intake would not be commensurate with the disease condition or nutritional

status. Nutrition education and counseling will help patients understand relationship between diets and their diseases and the importance of consuming all foods they are served. [2] This is especially so, because most of the foods that patients received from outside the hospital, were junk foods and not often suited to their medical conditions.

## CONCLUSION

Anthropometric assessment and nutrition counseling was done for 70.4% and 54.5% of the in patients respectively. Generally, the patients are satisfied with the hospitals food. Gender and level of education influence various aspects of patient satisfaction.

## REFERENCES

1. Ministry of Medical Services. 2012. National Hospital Food Service And Nutrition Care Policy Guidelines
2. Kyungjoo, K, Minyoung, K, and Kyung-Eun, L. 2010. Assessment of foodservice quality and identification of improvement strategies using hospital foodservice quality model. *Nutrition Research Practise*. 4(2): 163–172.
3. Ferguson, M. C. 2001. Development of a patient satisfaction survey with inpatient clinical nutrition services. *Australian Journal of Nutrition & Dietetics*, 58(3): 157-163.
4. Seetesh, G. and Vivek S.A. 2011. Patient Satisfaction With Medical Services: A Hospital-Based Study. *Health and Population - Perspectives and Issues* 34(4): 232-242, 2011
5. Government of Kenya. 2010. The Constitution of Kenya 2010. Kenya Government Printers press
6. Gosmanov, R. A., and Guillermo, E. Umpierrez. 2012. Medical Nutrition Therapy in Hospitalized Patients with Diabetes. *Current Diabetes Reports*. 12(1): 93–100.
7. Merkouris, A., Ifantopoulos, J., Lanara, V., et. al. 1999. Patient satisfaction: A key concept for evaluating and improving nursing services. *Journal of Nursing Management*, 7(1): 19-28.
8. Wright, O. R. L., Connelly, K. B., and Capra, S. 2006. Consumer evaluation of hospital foodservice quality: an empirical investigation. *International Journal of Health Care Quality Assurance*, 19(2): 181-194.
9. Tranter, M. Gregoire, M. Fullam, F. et. Al.. 2009. Can Patient-Written Comments Help Explain Patient Satisfaction with Food Quality? *Journal of American Dietetics Association* 109: 2068-2072.
10. Prins, A. 2010. Nutritional assessment of the critically ill patient. *South African Journal Clinical Nutrition*; 23(1):11-18
11. Aljaziri, S. 2011. Analysis Of Patient Satisfaction Surveys To Identify Actions To Enhance The Food Service Operation At The Mental Health Hospital In Taif, Saudi Arabia. A Research Paper Submitted To the Graduate School In Partial Fulfillment Of The Requirements For The Degree. 1-67 Master Of Arts Family And Consumer Sciences-Nutrition Option ball State University Muncie
12. Theurer Vanessa A. 2011. Improving Patient Satisfaction in a Hospital Foodservice System Using Low-Cost Interventions: Determining Whether a Room Service System is the Next Step. All Graduate Plan B and other Reports. Paper 32.
13. Health and Social Services. 2005. NWT Hospital Satisfaction Questionnaire *Staton. 1-15*
14. Amany, M. Abdelhafez1, Lina Al Qurashi, et. al. 2012. 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* 2(6): 123-130
15. Capra, S., Wright, O., Sardie, M., et. al. 2005. The acute hospital food service patient satisfaction questionnaire: The



development of a valid and reliable tool to measure patient satisfaction with acute care hospital foodservices. *Foodservice Research International*, 16: 1-14.

16. Sitzia, J. (1999). How valid and reliable are patient satisfaction data? An analysis of 195 studies. *International Journal for Quality in Health Care*, 11: 319-328.
17. Hartwell, H.J. Edwards, J.S.A. and Beavis, J., 2007. Plate versus bulk trolley food service in a hospital: comparison of patients' satisfaction. *Nutrition*. 23, 211-218.
19. Kulkarni, M.V. Dasgupta, S. Deolke, A.R, 2011. Study of satisfaction of patients admitted in a tertiary care hospital in Nagpur. *National Journal of Community Medicine*. 2:1 37 - 39
20. Aldaqal, S. M, Hattan, A. Hassan, A. et. al. 2012. Determinants of Patient

Satisfaction in the Surgical ward at a University Hospital in Saudi Arabia. *Life Science Journal*. 9(1)

21. Reena, K. 2003. Patient Satisfaction Document. *Journal of Academy of Hospital Administration* 15(1):1-6
22. O'Hara, P.A. Harper, D.W. Kangas, M. et. al. 1997. Taste, Temperature, and Presentation Predict Satisfaction with Foodservices in a Canadian Continuing-Care Hospital. *Journal of American Dietetics Association*. 1997;97:401-405
23. Barton, A.D. Beigg, C.L. MacDonald, I.A.et. al. 2000. High food wastage and low nutritional intakes in hospital patients. *Clinical Nutrition* 19,445-449.
24. Kowanko, E. Simon, S. Wood, J. 2001. Energy and nutrient intakes of patients in acute care. *Journal Clinical Nursing* 10:51-57.

How to cite this article: Ahoya B, Situma J. Anthropometric assessment and patient satisfaction with hospital meals in county referral hospitals of western Kenya. *Int J Health Sci Res*. 2015; 5(7):317-325.

\*\*\*\*\*