

Patient food preferences can help plan hospital menus for older patients

ABSTRACT

Aims: Malnutrition causes a huge burden on health and social services; wastage of hospital food is high and intake poor, particularly in older patients. This study looks at the lunch choices of older patients and considers how hospital meals could be altered to improve consumption.

Study design: Over a four week period, the food choices of patients on elderly care wards were studied. The amount of food consumed and choice was evaluated in the context of food availability.

Place and Duration of Study: The project was undertaken in Elderly Care Medicine wards in a District General Hospital in the South East of England. Participants were older patients with a variety of medical conditions who had the capacity to consent to a discussion about their food choices, consumption of food and preference for different food items.

Method: Of the 402 patients studied, 23% were given food they did not like and that they would not usually chose.

Results: Popular menu choices included "unusual soups" and "baked or roasted meat". Unpopular menu choices included sandwiches and desserts with no fruit. The items that were most consumed were desserts containing fruit and vegetarian main courses. Vegetarian pastry dishes and sandwiches were poorly consumed.

Conclusion: Many older patients who are able to choose from a hospital menu failed to see foods that they would normally consume. Certain foods are preferentially chosen and when delivered were consumed well. Older patients in this geographical area chose traditional foods and foods that are more difficult or more costly to prepare at home e.g. roast joints of meat and fruit containing desserts.

Key Words:

"Food choice", malnutrition, older/elder patients, food consumption, hospital.

1. INTRODUCTION

"Thousands of patients are annually starved in the midst of plenty from want of attention to the ways which make it possible for them to take food." Florence Nightingale (1)

Malnutrition in hospital is a longstanding problem particularly for older inpatients as they are more likely to be malnourished on admission and have inadequate intake in hospital (2) and Florence Nightingale's observation, is still applicable today. Approximately two-thirds of older admissions became malnourished despite a number of national initiatives (3). Protected meal times (4-6), mealtime assistance (7-9) and red tray triggers (10) are only useful if a patient has an appetite and wants to eat.

Comment [FN1]: Did you assess the nutritional status of the patients before and after the four weeks? Alternatively did you get this information from the patient medical records? I mean anthropometric values, necessary biochemical values and clinical information that is related to nutrition status.

Inadequate dietary intake and large amounts of food wastage are common in hospital (11) but particularly with older patients. In one hospital, energy intake was 73% of the minimum recommended and 42% of the food served to older patients was thrown away (11). We have also found plate wastage to be 36% in our hospital.

A number of factors are likely to inhibit dietary intake in older patients:

- Disability (e.g. poor vision, co-ordination, ill-fitting dentures, musculoskeletal pathology, cognitive impairment, fatigue)
- Poor appetite (illness, presentation (including volume) of food served, ward environment) (12)
- Choice of foods (dislike of certain foods, not being given choice, choosing nutritionally-poor food, cost) (13, 14)
- Mealtimes being interrupted by ward activities, not being allowed time to finish eating. (15)
- Staff issues (lack of time, poor appreciation of patient needs, lack of training) (16)
- Hospital (lack of food and drink strategy) (17)

This study focuses on the menu choices including whether patients received meals that they would have normally chosen. Assessment of appetite immediately before eating, and suggestions from the patients as to how hospital meals could be improved were also explored.

2. METHODOLOGY

Lunchtime on five elderly care wards (total 122 beds with 96% occupancy) was studied over four weeks at the Royal Berkshire NHS Foundation Trust, Reading (RBFT). Each day, 20 patients fulfilling the study criteria were randomly recruited. The group comprised of 122 patients (81 female, 41 male, with a mean age of 85 and range 68-102 years. Patients were excluded if they were on a special diet which substantially limited the possible options on the menu, if menu choices were not made by the patient, or if the patient lacked capacity. Patients were divided into two groups- those who participating five or more times and those who took part less than five times to test for heterogeneity. Lunch was chosen as it is the main meal for the majority of older patients and contributes 30% of total energy and 53% of daily protein consumed.

Lunches at the RBFT are ordered the day before on a menu card and arrive ready-assembled on trays having been cooked on site. Choices include a vegetarian soup or a juice, three main courses, two vegetable and two starchy carbohydrates with three options for dessert. Menus are rotated every two weeks; "large" and "small" portion sizes are offered, with "small" being approximately 65% of a "large" portion. Questionnaires asked if patient had received food that they would normally eat, an estimation of their appetite before food, how much they had eaten and other comments. Patients were interviewed after lunch by an independent interviewer and questionnaires matched to the relevant menu cards.

As the menu rotates every 14 days it was important to factor in the number of times an individual food item was available. During this period menu choices were analysed;

- "choice ratio" (CR) is the number of times that a food is on the menu divided by the number of times it is chosen during the study period. If a patient chooses fish four times of a possible eight opportunities the CR is 8/4 i.e. 2.0
- total eaten (TE) (a small portion was considered to be 1.0 units and a large portion was 1.5 units). This was then multiplied by the estimated proportion of the food eaten (e.g. if a patient consumed half a large portion this was 0.75 units and a whole small portion was 1.0 units).

Comment [FN2]: What does lack of capacity mean? Please elaborate the incapability.

Comment [FN3]: Malnutrition is caused not only by food insecurity resulting from lack of adequate food intake but also nutrient insecurity. Were these hospital meals balanced, nutrient dense, moderate in fats and sugars, adequate and had variety in terms of food items provided? Was there diversity in menu items?

Comment [FN4]: Methods of food preparation are important to state for any meal assessment. Some ingredients like fats and spices are factored in any discussion on appetite matters. Methods of food preparation and ingredients are important factors to consider in meal planning for invalids and convalescents.

Comment [FN5]: Most sick individuals can handle small frequent meals. Was this factored in under meal portion size discussion?

Comment [FN6]: Clearly indicate how appetite was assessed.

- total amount consumed per choice (TAC) is calculated by dividing the food eaten (TE) by the choice ratio (CR) to enable comparison between different groups, i.e. soups with desserts)

3. RESULTS AND DISCUSSION

No significant differences were found between data from patients who were interviewed more or less than five times. The first meal that a patient received after admission was **dis-counted** as this would have been chosen by ward staff in anticipation of the bed being occupied. The numbers of repetitions in a two week cycle are illustrated on Table 1.

Table 1- The number of times an item appears on a menu in the 4 weeks of study

Food Items	N =
Meat (also minced) roasted or baked	6
Fish	8
Meat in pastry	10
Poultry in sauce	8
Liver	4
Red meat and sauce	14
Meat sandwich	20
Fish sandwich	16
Cheese or egg sandwich	20
Mashed potatoes	28
Roasted or fried potatoes	18
Boiled rice	10
Peas and beans	12
Carrots	4
Swede and cabbage family	20

Food Choice;

Of the 402 interviews, there were 93 incidences (23%) of patients being given food that they did not want or **like**. This was particularly common in the 18 patients who were eating very little or nothing i.e. < 0.5 units, where 44% of the 25 lunches had included items the patients would not normally eat and had not liked.

Hunger and ease of eating

Only 48% were hungry before the meal was presented. In 23 of the interviews (5.7%), patients admitted to being "uncomfortable" eating, with the most common reported issues being impaired hand co-ordination and poorly fitting **dentures**.

Popularity of foods

The popularity of different foods was analysed by comparing "choice ratio" (CR) see Table 2.

Comment [FN7]: Do you mean it was omitted from your analysis?

Comment [FN8]: If they were given foods that they did not like what were the substitutes offered? I would love to see what food choices they made and what was substituted for these food items.

Comment [FN9]: The patient may have had good appetite but the lack of coordination affected their intake. Is that what this statement means? Once more how was appetite assessed? Malabsorption, steatorrhea, nausea and vomiting may affect dietary intake resulting into poor nutritional status. Were this looked into under this study?

Table 2 Popularity of various foods

	<i>Group</i>	<i>Choosing frequency</i>	<i>Choosing ratio (CR)</i>
Juice/soup	Ethnic or unusual soup	126	12.6
	Traditional soup	192	10.7
	Juice	132	4.7
Main course	Meat (also minced) roasted or baked	74	12.33
	Fish	78	9.75
	Meat in pastry	78	7.8
Potatoes	Mashed potatoes	322	11.5
	Roasted or fried potatoes	124	6.9
	Boiled rice	25	2.5
Vegetables	Peas and beans	132	11
	Carrots	39	9.8
	Mixed vegetables	64	8
Dessert	Apple and pear	92	6.6
	Garden fruits*	51	6.4
	Desserts containing sultanas	34	5.7

The most popular menu choices were “unusual soups” (including asparagus, minestrone, broccoli and stilton) (CR 12.6), any soup (CR 11.36), baked or roasted meat (such as roast dinners and shepherd’s pie) (CR 12.33), mashed potatoes (CR 11.5), and fish (CR 9.75).

Unpopular choices included vegetarian main courses (CR 1.67), sandwiches (CR 0.45), boiled rice (CR 2.5)) in contrast to meat main course (CR 8.14) and desserts not containing fruit (e.g. semolina, sponge puddings, rice puddings) (CR 3.35).

Total amount consumed per choice (TAC) for different menu choices was calculated by dividing the total food eaten (TE, see above) by the choice ratio (CR, see above) and converted into a percentage.

Foods which were eaten well included desserts containing fruits (TAC 84.27%), in particular desserts containing apricots and peaches (TAC 95.84%), vegetarian main courses (TAC 92.71%), and roast parsnips (TAC 86.71%).

Foods not eaten well included sandwiches (TAC 48.13%), in particular, meat sandwiches (TAC 32.69%), grilled tomatoes (TAC 59.62%), and vegetarian dishes containing pastry (such as vegetarian quiches and pasties) (TAC 53.57%).

Qualitative analysis

There were criticisms of the food and a variety of suggestions. Some of the recommendations were unusual with one participant requesting that the roast parsnips be served with cream!

Some patient’s commented that the food was “difficult to eat” with some items being too “tough” roast beef (n=5) and mixed vegetables (n=4). Some items were served in too large pieces e.g. tinned pears and brussel sprouts. Some food was “dry” (n = 10), had “too little

Comment [FN10]: Is there need to repeat this if it is already stated above?

taste" (n = 13), or "not sweet enough" (n = 6). Although the meat options were popular choices, three patients asked for more vegetarian options, four asked for more variety in the vegetables and four requested more fruit-containing items. Two patients considered being in hospital was a good opportunity to eat vegetables, in particular those too big to cook for one (e.g. cauliflower).

A few individuals were disappointed with the presentation of their lunch and some spotted perceived inconsistencies between what was on the menu and what was served (e.g. fish and chips, where there apparently was only one chip on the plate, and pear crumble which did not appear to contain any pear). The opening of sandwich packets was difficult for some interviewees. Suggestions included food being served with condiments (salt, pepper and sugar) and every meal being served with a bread roll.

Food requesting

Patients were served foods they didn't like and would not have usually ordered or eaten (23%), especially in those eating very little. A solution to this problem may be to have "buffet" style meals as seen in Denmark (18) served from a trolley where the patient chooses his/her meal on a specific day and even indicates portion size with help from trained staff members. This is very popular with patients (19) although the time taken to choose, the risk of food getting cold, and difficulty in estimating portions of each dish required are drawbacks. A compromise could be to have a constant selection of side dishes, snacks and desserts on a trolley and for patients to order their choice of main dish from a rotating menu to be plated up centrally and served on a tray. Obviously such a major change in the system would have cost implications and further study of food wastage and economic analysis (20), would be required before instigating such a system on a large scale. A "nutrition assistant" identified on each ward to focus on improving dietary intake and to educate and manage other staff members has resulted in improvements to the patients' experience of hospital meals (20, 21).

The additional cost of improving the menu by substituting higher energy options is not negligible. However, despite length of stay being unaffected such approaches do significantly improve the mean energy intake of older patients (22) which is directly related to consumption.

Hunger and ease of eating

Half of the patients questioned felt hungry before a meal, therefore presentation, quality, and acceptability of the food are important to ensure that intake is optimised. It is impossible to determine if the "not hungry" patients were as a result of a large breakfast and snacks or their lack of appetite might be balanced with a good appetite in the evening. This could be resolved by studying patients' reported "hunger" and intake throughout the day, although appetite is often poor in hospital and plate wastage occurs throughout the day.

Physical problems with eating (such as ill-fitting dentures) is probably under-reported at 5%. An observational study of elderly patients in Sweden found 82% had difficulties with physical aspects of eating (23). A Belgian nursing home study found residents without either a complete set of dentures or teeth experienced less pleasure when eating and were at greater risk of becoming malnourished compared to residents with a near or complete set of dentures or teeth (24). Many hospital patients are edentulous, fail to wear dentures and if dentures are available they often fit badly.

Menu choice and eating patterns

Comment [FN11]: Is it possible to have photos of how the foods were presented as figures in this paper? If allowed under your study ethics, it would add value. Meal presentation is vital among invalids and convalescents and particularly the elderly persons.

Comment [FN12]: This information can go to the recommendations section of your study.

Comment [FN13]: Suitable recommendations to hospital management, nutritionists among other stakeholders should be outlined in a separate section.

Comment [FN14]: Aren't such patients put on special diets, like liquid and soft diets?

Foods which were chosen most frequently (CR) did not always correlate with the foods which were most consumed (TAC). For example, the choice ratio for roast/baked meat main course was 12.33, although the amount eaten per choice was 80.77%. The hot vegetarian main course group only had a choice ratio of 2.0, but the total amount eaten per choice was 92.71%. Certain popular menu choices may not be liked when they arrive. The portion size and other items on the plate may also affect consumption. For example, a vegetarian main course may be served with vegetables; the latter may not be eaten and therefore the former consumed in larger quantities. A buffet system where patients can see the food and make an informed choice about combinations of food may improve this. An alternative may be to have menus where the food choices are described further (as would be expected on some restaurant menus) or even pictures (as used by food manufacturing companies) (<https://www.apetito.co.uk/our-services/home-delivery-services/hot/menu/>). Although these menus are used when communication issues are present this is not routine. A balance must be struck between having "popular" dishes which are likely to be well chosen and variety. Patients in hospital for a long time may not choose to consume the same meal on several occasions although a two week cycle helps to negate this. Further studies may better identify popular choices, and these could be made available on a daily basis with other "specials" on a rotating menu. A small pilot study found that increased variety within one plate increases average energy intake although not necessarily total protein intake (25).

All hospital foods are suitable for most patients. However, even experienced athletes with good nutritional knowledge often make uninformed menu choices (26). Likewise labelling of healthy choices in a menu designed for hospitalised children did not result in sustained healthy choices (27).

Qualitative analysis and other comments

The patients involved in this study were eager to give their comments on the food; this enthusiasm could be harnessed by individual catering companies and hospitals to improve the acceptability of their food; for example, comment cards could be supplied on every tray and returned to the kitchen. Frequently experienced comments could be considered and adjustments made to ingredients and preparation techniques as required. Comments were varied and often conflicting with some patients finding a pudding too sweet and others stating that it was not sweet enough. Introducing condiment packs may help, as patients could adjust their meal to taste.

This study used a semi-structured interview in order to evaluate patients' lunch time experience; although structured questionnaires have been developed and validated to identify problems that patients face when trying to access food (28). Use of this on a large scale could be invaluable for hospitals aiming to improve food delivery and overall nutrition.

CONCLUSION

Florence Nightingale's recommendation for patients to be fed palatable, well-presented, nutritious food in an environment well suited to eating without distraction is still applicable today. Malnutrition in the older population in hospital continues to be a huge problem and efforts are being put in place to reduce it. Further studies need to look at all aspects of the catering process in hospitals and adjustments made to menus and food serving practises to ensure that elderly patients receive a varied and nutritious diet that they will eat. Geographical area, patient demographics and season will affect choice although if well liked foods are delivered consumption should be optimised. Factors such as the role of UK dieticians in choosing different strategies to improve nutrition as well as quality improvement strategies led by Clinical Nurse Specialists play a major role in improving nutrition care planned guidance and meal intake (29, 30).

Comment [FN15]: Move this to recommendation section. Is it feasible to have the buffet system considering they very many different needs the patients may have?

Comment [FN16]: It would be good to elaborate on this recommendation. What are your suggestions for variety?

Comment [FN17]: Healthy food choices could also be covered under nutrition education and nutrition counselling of these patients.

Comment [FN18]: As earlier stated I would love to see the aspect of preparation methods and ingredients used in the meals you studied

Comment [FN19]: This can be clearly stated under the methodology section

Comment [FN20]: Was this a limitation for your study?

Comment [FN21]: This can fall under recommendations section for further research.

Comment [FN22]: Give details of the meal composition specifying the methods of preparation and ingredients used and the meal characteristics- were the meals balanced, were they adequate, nutrient dense etc.

Comment [FN23]: Give details of meal presentation preferably show pictures of the trays with the meals

Comment [FN24]: Give more information on the hospital environment under which the patients took their meals as observed during your study

COMPETING INTERESTS

The author has nothing to declare.

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