E-menus – Managing Choice Options in Hospital Foodservice

Abstract

This study examined an initiative in which e-menus and touch screen technology were piloted in a large UK hospital, with the aim of improving food service and satisfaction. Current practice often means that patients may receive the wrong meals, resulting in dissatisfaction and plate waste.

An alternative approach is for patients to use electronic menus (e-menus) to make their order, using touch screen technology on the TVs, which in many hospitals are provided at every bedside. A pre-test, post-test questionnaire, which elicited scaled responses and written comments (n=90) was administered to a comparable group of patients. Results from both types of data suggested that most patients used e-menus effectively, although for older patients, it was more challenging. However the biggest difference in the effectiveness of the new technology was between the wards, which also showed substantial differences in service standards. It is concluded that e-menus are an effective way of imparting information about the food, and that they tend to produce greater satisfaction in recipients. However, the results suggest that more training of foodservice staff will be required in order to make the most of initiatives of this kind.

Introduction

Although hospital food and foodservice are known to have a positive effect on patients' physical and psychological wellbeing (Hartwell & Edwards, 2003; Johns et

al, 2013) catering provision in hospitals has a poor reputation and has been a source of complaints for many years, especially in terms of food palatability and menu variety (Hartwell et al, 2007). Poor palatability is mostly due to loss of temperature and deteriorating organoleptic quality resulting from delays in service after preparation or regeneration (Hartwell et al, 2007), which may be caused by long transport runs from distant kitchens (Wilson et al., 1997; Kipps & Middleton, 1990), by the exigencies of medical rounds, or by ward conditions (Johns et al., 2013, Jessri et al. 2011). A contributory factor is poor liaison between foodservice and medical staff (British Association for Parenteral and Enteral Nutrition, BAPEN 2007).

Hospital food service provision worldwide is increasingly subject to constraints of budget and competition (Wanstall et al., 2000) and in many places faces increasing demands to operate as a profit centre rather than as a cost centre (Santoro, 1999). Cost saving initiatives in the USA includes self-operated food kiosks and home meal replacement programmes for hospital staff (Wanstall et al., 2000). Garner (2004) notes instances in the UK where hospital caterers have offered their facilities as a venue, or catered private outside events. In some hospitals nursing staff are allowed to buy oversupplied meals from the bulk trolley at a reduced price (Gledhill, 2000). Nottingham City Hospital operates a 50 bed hotel for visiting relatives of patients and convalescents who do not need a clinical bed, as a commercial enterprise (Garner, 2004). Hospital food service managers have

sought to make their operations more competitive by adding brand names to menus, remodelling dining spaces and expanding the customer base to include the local community, using side entrances from the street (Lapp, 1997). Another approach has been to remodel hospital food service along the lines of hotel room service (Anon, 1999a; Malone, 2001).

The hospital food service industry is increasingly turning to technology in its efforts to improve patients' meal experience, for instance by developing new ways to cook, store and serve the food (Edwards, 2000; Hartwell & Edwards, 2003; Edwards & Hartwell, 2006, Hartwell et al., 2007). Technology can also influence how, where and when food is ordered and eaten. For instance it has been used in the USA to model hospital food provision on hotel room service, allowing patients to order anything including snacks from the menu whenever the kitchen is open, providing their order meets dietary restrictions. In these initiatives, food service personnel were issued with hand held palm computers (Jackson, 2000) or radio headsets like those used in fast food restaurants (Lavecchia, 1998). It was possible to deliver food within 30-45 minutes of the order being placed and the hospitals reported a 20% increase in patient satisfaction scores. Room service was rated better than regular ward service in terms of the timeliness of meals, temperature and quality of the food, and the variety of menu choices (Stein, 2000; McLymont et al., 2003). The extra cost was considered to be recoverable through annual savings on factors such as food waste. Notwithstanding, the use of technology within the

menu ordering process is slow to emerge and may also be used to communicate meal orders, replacing the pre-printed forms currently used in many hospitals. Typically such forms are completed by patients on the previous day, and if a patient is transferred or discharged, the newcomer to that bed receives the previous incumbent's meal. Ward staff often consolidate patients' requests into bulk orders, and when they are rushed they may place a bulk order for the ward without consulting patients (Johns et al. 2013). Consolidated orders are typically communicated telephonically or in written form to food preparation staff in the kitchen in the UK (Johns et al., 2013) and elsewhere (Jessri et al., 2011). The result of these practices is that patients may receive the wrong meals, resulting in dissatisfaction and plate waste (Heffernan & Moloney, 2000; Edwards & Nash, 1997).

An alternative approach is for patients to use electronic menus (e-menus) to make their order, using touch screen technology on the TVs, which in many hospitals are provided at every bedside (Hartwell & Edwards, 2009). Interactive electronic menus can be denoted by the term "e-menu", originally coined by Tucker (2008) for selection menus on e-commerce sites, and other virtual applications. In principle such systems can be linked directly into the food production system to ensure that every order is individually and correctly placed. Ofei et al. (2014) note that electronic ordering can respond directly to the patient's needs, reducing the number of wrong orders, enhancing food intake and cutting the amount of plate

waste. The TV display also makes it possible to provide more information about the food than can be provided on a paper menu. Increasing the amount of menu information is beneficial for recipient satisfaction because it assists choice and enhances food intake (Vanderlee & Hammond, 2014),

Increasing the amount of menu information displayed also assists hospital catering practice. Although there is no current European legal obligation to provide information about nutrition, ingredients or provenance on menus, there is a growing demand for information relating to catered food. For instance consumers are increasingly interested in the health characteristics of foods, including ingredients and nutritional composition (Hoefkens et al, 2012). Provenance is growing in importance due to concerns about food miles, and the ethics of production (Rose, 2014; Butcher, 2014). In addition, European legal obligations, for instance to indicate potential allergens (Food Standards Agency, 2014) will further increase the amount of information that caterers need to provide about their food. These pressures challenge operators to enhance the amount of menu information that can be provided. E-menus permit all these types of information, as well as pictures of the dishes, to be presented at the point of food selection. The research discussed in this paper sets out to evaluate the use of e-menus in an actual hospital-based initiative.

Apart from a study by Beldona et al. (2014) which relates only to tablet technology in commercial restaurant environments, there has been no research that has

rigorously evaluated e-menus in a hospital situation. The study discussed here sets out to evaluate a bedside menu system based upon touch screen technology in a UK National Health Service (NHS) hospital. This e-menu system allowed patients to preview dishes and make selections just hours before meals were served, instead of completing a paper order form a day in advance. The e-menus showed pictures of the meals and gave a comprehensive description, with details of ingredients and where they were sourced as well as nutrition and allergen information. This move to touch-screen menus was among the first in the UK healthcare food service industry and sought to provide patients with a greater level of choice and assurance about their catered food. Hence the aim of the study was to evaluate an initiative in which e-menus and touch screen technology were piloted in a large UK hospital.

Methods

The study took place in a NHS hospital located in the South of England, which was an early adopter and trialled an electronic menu system during the early part of 2011. The hospital used had 42 catering staff who prepared the meals for all the wards providing over 3000 patient meals per day. In addition, they supplied the day wards with cold lunches and snacks and provided meals for two public restaurants used by staff, visitors and some ambulant patients. The hospital used 4 sets of seasonal menus throughout the year on a two-weekly cycle. Under normal ward practice, patients ordered their food 24 hours before the corresponding

mealtime by filling in printed forms, and these individual food orders were consolidated by ward staff and telephoned to the kitchen as a bulk order for the following day. Bulk orders were then entered into a computer system for the kitchen to action. With the new initiative patients ordered directly using the bedside TV screen with the order being transmitted directly to the catering department. Senior management granted permission to evaluate patients' attitudes to e-menus, provided that the validated existing foodservice evaluation questionnaire formed the basis of the study. Managers of the facilities department also gave their support for the research.

The questionnaire used was based on the food service satisfaction questionnaire regularly administered by the facilities department. This hospital participated in evaluations of plated versus bulk trolley food service during the 2000s and the satisfaction questionnaire was a legacy from that study. At the time of the study the version used in the hospital consisted of ten questions about different aspects of the food and service with space for open ended comment if required. Item wording s can be seen in Table 1, discussed below. Upon factor analysis the original questionnaire gave two groups of items relating to the meal experience overall and to challenges, the latter factor containing the two negative items Q10 and Q12 and the two items relating to the provenance of the food Q8, Q9. Cronbach's alpha values for the whole item set and for the two factors were 0.561, 0.815 and 0.585, respectively.

To this original instrument were added four extra questions, numbered 1,2 3 and 13 in the table, relating to patients' experience of the TV ordering. These extra questions were agreed with the hospital facility department and catering manager and then piloted with a small sample of patients. The final questionnaire contained three factors, the two original ones, plus a factor devoted to ease of use of the menu, which contained items 1, 2 and 3. Item 13 appeared in the meal experience factor with items from the original questionnaire. Cronbach's alpha values for all items and for the two factors were 0.691, 0.853, 0.817 and 0.585, respectively

A sample of 90 post-operative patients who had undergone elective surgery, had recovered well and were thought strong enough to provide information about the hospital meals were identified with the help of ward managers. Those chosen from the 10 wards piloting e-menus were in the convalescence stage of their recovery, and all met the following criteria. They were over 18 years of age, with no notable physical, cognitive or emotional conditions which might influence their food consumption, and with their appetite unaffected by their medical condition or medication. Their first language was English, they had eaten food on the ward for a minimum of 48 hours previously and they had an anticipated minimum stay of 5 days. These individuals were approached on the wards before the e-menu system was introduced and 87 completed the revised 14 item questionnaire. After the pilot e-menu had been trialled on patients' bedside TV screens, another

comparable group of 90 patients was asked to complete the same questionnaire, providing 75 usable questionnaires. A pre-test, post-test research design was used where both surveys invited respondents to comment about their experience, with designated spaces by each question. Data from the two surveys were entered into SPSS 22 and analysed using t-testing and one-way ANOVA.

Results

A breakdown of the demographics of both the samples is shown in Table 1. Participating patients were similar in terms of gender, age range and previous experience of hospital meals. These figures also broadly reflected the demographic distribution of patients at the hospital as a whole.

Table 1 about here, please

Results from the surveys are shown in Table 2. The post survey showed a significantly greater score for item 9 "It is important to me where the ingredients have come from" (p<0.001) than the pre survey. Two people in the post survey group commented that it was important to them to know the provenance of their food. Otherwise there were no significant differences between the pre- and post-surveys.

Table 2 about here, please

There was a significant difference between the responses of males and females to just one item, no. 10 "The meal experience did not meet my expectations"

(p=0.044). A single comment "could have done with more" suggests that the survey result may have related to the quantity rather than the quality of the food, which elicited positive comments from females but not from males. Those with previous experience of hospital food were significantly less concerned with provenance (item 9) than those who had no previous experience, and one individual commented "not important to me." Experienced consumers were significantly more concerned with being able to order their meal on the same day that they would eat it (item 13). An accompanying comment stated "food is fresher".

There were significant differences between age groups on Questions 1, 2 and 3, suggesting that age affected patients' ability or willingness to use the TV menu technology. Comments included "can't do it", "can't see the TV", "post op" [which by implication made one less able to cope], "nurse did it" [though whether on request is not clear], "difficult to use" (5 responses), "I don't want to know" and "OK when once shown how to". One person commented that because they were not presented with an order form they forgot to order their food.

One-way ANOVA showed that the largest number of significant differences in survey responses, six in all, was between the different wards. Questions affected included item 1 "I liked ordering my meal [on the TV]" and item 2 "I found the food ordering system very easy to use". In addition there were significant differences between wards on items 4 "I received the food that I ordered" 7 "the dish

description was helpful to my choice", 9 "it is important to me where the ingredients have come from" and 12 "food service was poor". Chi square analysis was used to establish whether this might be due to demographic differences between ward populations. Age group did not vary significantly between the wards (χ^2 = 51.6, d.f.=50, p = 0.409), but gender (χ^2 =31.6, d.f.= 10, p = 0.001) and experience (χ^2 = 20.7, d.f.= 10, p=0.024) did show significant variation among the wards. Gender did not affect any of the items that differed between the wards, but differences between the wards relating to item 9 (provenance of ingredients) and item 12 (food service quality) might be attributed to an uneven distribution of experienced versus non-experienced patients between the wards.

Other differences between wards cannot be explained in this way. Most notably the variability of items 1 and 2 (relating to the facility and ease of using the TV menus) cannot be explained by age differences between the wards, and must therefore be expressing differences in the way the menus were supported by ward staff. This idea is upheld by some of the other items that differed between the wards, especially items 4, 7 and 12, which relate to service standards, the availability of information and the helpfulness of ward staff. The ward staff clearly played an important part in the effectiveness with which the TV menus were implemented, suggesting that training would be required if the menu system was used more extensively.

Some interesting comments were as follows. Against item 4 "I received the food that I ordered" two patients in the pre-group, but none in the post-group noted that what was ordered did not always arrive. Against item 12 "Food service was poor" there was only one comment: "People cared a lot that I got what I wanted" (post-group), although 46 respondents (28%), evenly split (23:23) between the pre- and post-groups strongly agreed that service was poor. Against item 8 "I would like to know more about the food on the menu". One person mentioned lactose intolerance; there must be similar concerns about allergies and other conditions where people feel responsible for what they eat.

Discussion

Similarities between item responses from the pre and post surveys suggest that patients equated the new e-menu system with the original food ordering process. However, there were differences in their perceived facility with the technology with the responsiveness of ward staff to help clearly an issue. The only other difference was that patients who had seen the televised menus expressed more interest in the provenance of the food. The survey result was supported by two positive, written comments. The likelihood is that the availability of information increased patient awareness of provenance. It is also probable that this enhanced awareness, together with the assurance provided by the e-menu information increased patients' satisfaction with the choice process and possibly with the meal experience overall.

The difference between males' and females' responses to item 10 could be ascribed to normal statistical variation (p=0.044). However, taken at face value it suggested that males were less satisfied with the meals than females. Since the only comment referred to the amount of food provided, quantity rather than quality may have been the key factor underlying this difference. The survey showed that patients with previous experience of hospital food were significantly less concerned with provenance (item 9) than those who had no previous experience and were also more concerned with being able to order their meal on the same day that they would eat it (item 13). The comments against these two items suggest that to experienced patients "freshness" meant "delivered quickly from the kitchen", while non-experienced individuals took for granted that their meal would be sent quickly and therefore paid more attention to the freshness of the ingredients that would go into it.

Differences between age groups were all among items 1, 2 and 3, concerned with using the TV menu technology. These showed the difficulties that older individuals may experience in adapting to new processes and electronic systems. It may be necessary to take this point into account when implementing this system further, since the average age of hospital populations is on the increase (Royal College of Physicians, 2012). On the other hand, the proportion of individuals of all ages who are familiar with technology is also increasing (E-marketer, 2014). It was

encouraging that two older individuals commented that they quickly learned how to operate the TV menu.

The chi-square results suggest that differences between the wards relating to items 9 and 12 (provenance of ingredients and food service quality respectively) may have been due to an uneven distribution of experienced versus non-experienced patients between wards. However, differences between wards on other items cannot be explained in this way. Specifically, variance of items 1 and 2 (relating to the facility and ease of using the TV menu) between the wards cannot be explained by age differences, and must therefore be expressing differences in the way the menus were supported by ward staff. This idea is upheld by differences in items 4, 7 and 12, all of which relate to service standards, the availability of information, or the helpfulness of ward staff. The ward staff clearly played an important part in the effectiveness with which the TV menus were implemented, suggesting that training would be required if the menu system was more extensively used. Significantly the electronic My Meal Menu system at a New Jersey Hospital (Anon., 2007) relied upon a "food service ambassador" going to patients to explain the procedure the first time they ordered a meal.

Other comments suggested that the new menu system was well received and that among other things it allayed anxiety about the provenance of the food and its suitability for vegetarians and for conditions such as lactose intolerance. Comments that the food service was patchy in terms of what arrived and when

(item 4) were only obtained from pre-tested patients, suggesting that the e-menu system did make a difference to the accuracy of ordering and service. There were 113 responses of 2 or less to item 12, as opposed to 17 scores of 4 or more, indicating that the service was generally regarded as poor. Despite this there was only one comment and this was positive. Perhaps patients' general lack of comment here made allowances for the nurses' working conditions that they saw around them.

There is a growing acceptance that food provided in hospitals has a significant impact upon patients' satisfaction and recovery. Scrutiny is high in England with the recent Hospital Food Plan showing that due to the multi-disciplinary nature of patient care collaborative innovative measures are required to ensure complete food and drink provision (Department of Health, 2014). Research in the retail industry has shown that consumers are reassured by product information, even if they do not actually use it, so that non-directive labels with high information content increase satisfaction with food products. However, consumers in retail situations have to process information quickly and therefore relatively superficially, whereas hospital patients have more time at their disposal and can engage in more systematic information processing (Hodgkins et al, 2012). There is significant debate amongst stakeholders as to the best labelling approach but very little information is available in out-of home situations such as hospitals.

Increasingly, technology has been used in several situations to improve the ordering of food. For instance patients were issued with palm-top ordering devices at Glens Falls Hospital (New York State) in the late 1990s (Anon. 1999b; Moorse, 2000). However, this technology was limited in scope and for instance could not provide attractive graphics or photographic images. Three years later it was reported that young patients in Cincinnati Children's Hospital were using View Master images to select food (Anon., 2003), but View Master is older and more cumbersome to use than computer technology. Beldona et al. (2014) note that menus provided on electronic tablets in a commercial restaurant situation transferred information more efficiently than printed menus, and because they permitted interactivity, the ordering experience was enhanced for customers.

From a communication perspective, complexity flows from the difficulty of representing multiple strands of information without cluttering the menu visually. Touch screen menu systems seem able to deliver richer information without visual overload, permitting greater transparency and accountability for the food service operator. This is advantageous for both foodservice managers and patients, and such a technological strategy is therefore in line with business goals, as well as patients' needs. Electronic menu technology has been slow to make an appearance in hospitals unlike in commercial settings, but the interactive platform that formed the basis of this study was met with enthusiasm by all stakeholders and its potential value is clear in a hospital setting.

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Table 1: Demographics of the survey samples

	N	M	F	Experienced	Non experienced	Mean age
Pre-TV screen initiative	87	57	30	68	19	70.76
%	100%	65.52%	34.48%	78.16%	21.84%	
Post- TV screen initiative	75	36	39	68	7	66.01
%	100%	48.00%	52.00%	90.67%	9.33%	
Both samples together	162	93	69	136	26	68.31
%	100%	57.41%	42.59%	83.95%	16.05%	

Table 2: Questionnaire results; comparison of different subsamples

Item no	Tested against	Pre/post TV initiative	Male/Female	Experienced/Not experienced	Ward	Age group
	N =	87/75	93/69			
	Test type	t	t	t	F	F
		Sig. (2-tailed)	Sig. (2-tailed)	Sig. (2-tailed)	Sig.	Sig.
1	I liked ordering my meal [on the TV]	.121	.864	.230	**.041**	**.011**
2	I found the food ordering system very easy to use	.088	.772	.826	**.014**	**.000**
3	I did not need any help ordering my food	.646	.785	.399	.142	**.000**
4	I received the food that I ordered	.538	.410	.969	**.003**	.730
5	The food was nicely presented on the plate	.496	.522	.456	.249	.316
6	The temperature of the food was appropriate	.831	.289	.742	.345	.230
7	The dish description was helpful to my choice	.877	.449	.453	**.024**	.752
8	I would like to know more about the food on the menu	.176	.136	.129	.666	.658
9	It is important to me where the ingredients have come from	**.001***	.408	**.005***	**.012**	.660
10	The meal experience did not meet my expectations	.893	**.044***	.052	.422	.333
11	There was plenty of choice available on the menu	.263	.298	.502	.116	.897
12	Food service was poor	.875	.370	.060	**.011**	.142
13	I like ordering my meal on the same day I receive it	.857	.219	**.030****	.106	.134
14	The food compares well with other hospitals I have stayed in	.509	.848	-	.215	.586
		* T > C	* M < F	*E < N		
				** E > N		