



## Developing a valid meal assessment tool for hospital patients



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### ABSTRACT

Patients' perspectives of meal items are critical in supporting effective decisions about meal provision in hospitals. The objective of this research was to develop a valid meal assessment tool (MAT), to quickly and accurately assess patient's views on meal items, for ultimate use in a large multi-centre trial.

Nine iterations of the meal assessment tool were tested for content and construct validity in a large acute care hospital to determine wording, number scale and physical orientation for responses. Patients were interviewed to assess content validity, ease of completion, timing and assistance requirement. Following expert feedback, the resulting tool consisted of a 7 point scale measuring three meal components (meat, starch and vegetable), with ratings for flavour and taste combined, appearance and quality. Measures of overall satisfaction, meal expectation, age and gender were included for direct comparability with the valid published Acute Care Hospital Foodservice Patient Satisfaction Questionnaire (ACHFPSQ).

Three hundred and four surveys were completed in the development process (77% response), 53% male, mean age 56 years. Best completion rates were by interview with completion times of 2–5 min. The tool was then made available in a large multi-centre meal assessment project (n = 14,500) and was able to detect differences between variations of the same meal and between the same ingredient prepared in alternative ways.

The MAT proved successful in discriminating meal components in terms of quality, taste and appearance and is useful for those planning and assessing meals in a variety of healthcare settings.

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## 1. Introduction

The most recent prevalence survey suggests that malnutrition affects about 32% of the acute care population in Australasia and that the group who is, or who develop malnutrition during hospitalisation, eat poorly (Agarwal et al., 2012). Meals are often described as the highlight of the day for many patients (Hartwell & Edwards, 2008), representing quality of life issues. Recent studies have linked failure to eat meals with increased in-hospital mortality (Agarwal et al., 2013). Quality and safety standards now require processes to be in place whereby consumers are partners in

the planning and evaluation of health services and systems (Australian Commission on Safety and Quality in Health Care, 2012). Measuring patient satisfaction with the total foodservices they experience and with individual meals they receive is an important component of this partnership as it can provide the basis for decision making around menu inclusions, improve consumer acceptance and ultimately improve intake and therefore contribute to the amelioration of malnutrition. The measurement of patient satisfaction with hospital foodservices has often been global in nature (Press Ganey Associates Incorporated, 2016; Wright, Connelly, & Capra, 2006). While global satisfaction is important, it is also important to identify specific aspects of meals which contribute to overall satisfaction and increased consumption. There is only a small number of published validated tools that measure patient satisfaction with meals (Dall'Oglio et al., 2015). A local tool, validated and used widely (Capra, Wright, Sardie, Bauer, & Askew, 2005) provides evidence around four constructs; food quality, meal service quality, staff/service issues and physical environment as well as overall satisfaction with the service. It does not address

*Abbreviations:* ACHFPSQ, Acute Care Hospital Foodservice Patient Satisfaction Questionnaire; MAT, Meal Assessment Tool.

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specific meals or meal components, but does address issues such as temperature of meals and beverages, level of choice and variety as contributors to food quality and meal service quality. While individual statements address general aspects of food quality such as meat toughness and the way the vegetables are cooked, none are related to any specific meal consumed. It is important to be able to gather richer data around components of specific meals, to assist menu planners in design, and to guide food preparers in improvements in taste and appearance. Importantly, data collection must be quick and easy, to provide as little disruption as possible and to gain the maximum completion rate possible, as well as be understood by diverse patient populations. Previous studies have identified that meat being tough and dry is a major issue at a general level (Fallon, Gurr, Hannan-Jones, & Bauer, 2008), but not in relation to specific meals. There is a need for a tool which can determine which meals in particular are an issue.

The aim of this research was to develop a valid Meal Assessment Tool (MAT) that could quickly and accurately assess patient's views on meal items to support quality decisions in the menu planning and evaluation process.

## 2. Materials and methods

A literature review was conducted to identify existing tools able to assess hospital patient's views on specific meals. The 'consumer opinion card' by Hartwell, Edwards and Beavis (2007) was the most recent relevant tool found, which was based on earlier work by Cardello published in 1982 with the addition of an ability to comment. It was unclear whether the 'consumer opinion card' as presented by these authors would fit easily into a range of contexts, namely diverse facilities, patients, menu styles and patient literacy levels.

The Hartwell tool addresses four aspects of the meal being tested; temperature, flavour, portion size and texture. It uses a seven point Likert scale, presented vertically, where one construct used seven as the most positive score, one used seven as the least positive score and two used four as the most positive score. The overall opinion of the item was presented in a horizontal line from seven (most positive) to one (least positive) from left to right. We commenced with this format, but as we were most interested in the various components of a meal (protein, vegetables, starchy component), a modification (the MAT), was developed. The constructs were altered to focus on these meal components, as the tool was to be complementary to the components of satisfaction measured using other foodservice satisfaction tools. The literature search did not identify meal texture as a useful menu planning construct as it includes personal preference and aversions within it. A section to capture comments was retained, so that other issues of concern to the specific patient, such as temperature and texture could be included. The MAT was tested for content and construct validity to confirm wording, number scale and physical orientation in a 929 bed acute care hospital in Queensland Australia.

A convenience sampling method was used to include patients from a variety of wards where testing was considered not too disruptive to patient care, including shorter and longer stay patients, gender mix and age ranging from 19 to 96 years. An iterative process was adopted to assess the best method of administration to maximise participation. The first method of administration was service staff placing the MAT on the meal tray with return of completed forms on the trays. This yielded poor returns, so a second form of administration was trialled where the MAT was delivered to patients, left for about 30 min and then collected. This also yielded poor return rates and so a third method of interview was undertaken. All administration methods sought to determine patients' opinions of the last meal consumed (either midday or

evening meal). Patients were then, regardless of administration method, individually interviewed to assess ease of completion, timing, assistance requirement and content validity, with for example questions of understanding of terms such as 'other vegetables' asked to identify that vegetables included as the 'meat component' (such as vegetables combined in mince or stews) were not the target. In addition, expert feedback was sought from tertiary qualified staff from the facility with extensive experience in managing and evaluating hospital foodservice systems. Nine iterations of the tool were assessed. Table 1 outlines the variations made to the tool during the development phase. During these iterations the following aspects remained the same: size of card (A4), font type and size, sequence of the three meal components (1) meat/alternative (2), starch (3) other vegetables, and questions on overall expectation and satisfaction with an additional area to note any comments made.

The final MAT consisted of a 7 point scale measuring three meal components (meat/alternative, starch and other vegetables), with ratings for flavour and taste combined, appearance and perceived quality. Measures of overall satisfaction and meal expectation on a five point scale, together with age and gender were included so that direct comparability with any data collected by the Acute Care Hospital Foodservice Patient Satisfaction Questionnaire (ACHFSPQ) (Capra et al., 2005) could be made if required. The final tool is shown in Fig. 1.

Once the MAT was finalised, a validation study of this tool was completed. Inpatients (n = 393) across 18 wards in the same acute care facility were approached to determine patient views on individual meals so that these could be compared within, and between, types of meals offered on a new menu implemented two months previously. The results of the overall satisfaction scores from the MAT was compared to a concomitant survey using the ACHFSPQ to determine if consistent overall satisfaction results were obtained.

### 2.1. Application of the tool in practice

The MAT was incorporated into a large multi-centre study in another jurisdiction within Australia. Facilities in the multi-centre study were selected to represent a full range of inpatients in the acute and chronic public health sector and included large (>620 beds) and small (<40 beds) facilities and, rural and urban hospitals. These hospitals were selected to be representative of the range of facilities and patient types in the jurisdiction. All patients on unrestricted diets were selected for inclusion in the trial. Those available during the 90 min directly after midday or evening meals were included. The MAT was administered by the interview method, as this had been determined to yield highest response rates in the development trials. Laminated cards printed in large font (landscape A4) showing the number scale 1–7 and the word descriptors (as per Fig. 1) were used to assist the interview process. All interviewers underwent appropriate training prior to implementation. Details of patient meal selections were linked through an electronic meal ordering system and confirmed at interview. The actual meal received was verified and recorded on the MAT.

### 2.2. Statistical analysis

All statistical analyses were performed with software package SPSS 22 (IBM Corp, 2012). Categorical variables (gender, meal type) were described by frequency and percentage. Normality of data for continuous variables was established. While the data on satisfaction were collected using a Likert scale, and it is recognised that intervals are not equal in such data, it was deemed that, as the sample was sufficiently large and the data were normally distributed, that parametric analysis methods were suitable and

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