



Easy to open? Exploring the ‘openability’ of hospital food and beverage packaging by older adults



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ABSTRACT

Food is increasingly a packaged commodity, both in the community and in institutionalised settings such as hospitals, where many older people are malnourished. Previous research with patients aged over 65 years in NSW public hospitals identified difficulties opening milk, water, juices, cereal and tetra packs. The aim of this paper was to assess the ability of well older people living in the community to open food and beverage items routinely used in NSW hospitals in order to gain further insights into the older person/pack interaction and the role of hand and finger strength in pack opening. A sample of 40 older people in good health aged over 65 years from 3 community settings participated in the study. The attempts at pack opening were observed, the time taken to open the pack was measured and the correlation between grip and pinch strengths with opening times was determined. Tetra packs, water bottles, cereal, fruit cups, desserts, biscuits and cheese portions appeared to be the most difficult food products to open. Ten percent of the sample could not open the water bottles and 39% could not open cheese portions. The results were consistent with the previous research involving hospitalised older adults, adding emphasis to the conclusion that food and beverage packaging can be a potential barrier to adequate nutrition when particular types of packaged products are used in hospitals or the community. The ageing population is rapidly becoming a larger and more important group to consider in the provision of goods and services. Designers, manufacturers and providers of food and beverage products need to consider the needs and abilities of these older consumers to ensure good ‘openability’ and promote adequate nutritional intakes.

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1. Introduction

The prevalence of malnutrition in the hospitalised older population is estimated between 6 and 53% in Australia depending upon diagnosis, assessment tool and timing (Walton, 2012) and between 20 and 65% in European and US hospitals (Gout, Barker, & Crowe, 2009; Kyle, Genton, & Pichard, 2005; Naber et al., 1997; Roubenoff, Preto, & Balke, 1987; Schenker, 2003; Visvanathan et al., 2003). In NSW public hospitals, the Special Commission of Inquiry into Acute Care Services (Garling, 2008) reported that at any point in time there were around 7480 people 65 years and older in hospital, representing 44% of all inpatients. With the projected growth in numbers of people aged 65 (older adults) and the corresponding growth in people aged above 85 (older old adults) and their complex and chronic health conditions, most hospital patients

in the future will be ‘elderly’. The report also discussed the provision of food and food services in NSW hospitals and the move towards centralisation of production with the ‘cook-chill’ system. Here food is mostly prepared in advance, kept chilled in a refrigeration system at the hospital and then heated in customised trolleys in the kitchen or on the ward. This form of food provision signals the regular use of packaged foods as these are considered cost effective and provide standardised portion sizes.

While the reasons for malnutrition are complex and multifactorial (Barker, Gout, & Crowe, 2011; Pereira, Bulik, Weaver, Holland, & Platts-Mills, 2015; Pirlich et al., 2005), hospital food service systems have a key role to play in enabling patients to consume food, beverages and supplements to assure adequate nutrition for recovery (Allison, 2003; Hartwell, Edwards, & Symonds, 2006; Jonkers, Prins, Van Kempen, Tepaske, & Sauerwein, 2001; Stratton, King, Stroud, Jackson, & Elia, 2006). The system can play a role in the ‘food as medicine’ paradigm of the holistic care model. However, a number of previous studies and reports have identified that food and beverage packaging is a contributing factor to

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malnutrition for the older and disabled in hospital settings (Lazarus & Hamlyn, 2005; Schenker, 2003; Tsang, 2008; Vivanti et al., 2008; Walton, Williams, & Tapsell, 2006). A 2007 NSW Health Service malnutrition prevalence audit identified that a number of patients did not eat their food because they could not open the packaging (Matthews, Bartlett, & Hall, 2007). NSW Health has acknowledged that food and beverage packaging can pose an accessibility problem for the patient and they have implemented a tender checklist for products purchased by the hospital system in an attempt to order the best performing packs (NSW HealthShare, 2013). Many products, however, such as water, biscuits and supplements (served in tetra packs) are considered by patients to be difficult to open (Bell et al., 2013).

Malnutrition is not restricted to the hospitalised older population. Research has identified that many older people enter hospital in a malnourished state, indicating that their nutritional status was compromised prior to admission. For example, one study in Sweden found 14.5% of older people living in their own homes were at risk of malnutrition (Johansson, Machrach-Lindström, Carstensen, & Ek, 2009). In a similar Australian setting of independently community living older people receiving home nursing services 34.5% were found to be at risk (Rist, Miles, & Karimi, 2012); while in a Belgium based study 57% of older home-living participants were at risk of malnutrition (Arvanitakis, Vandewoude, Perikis, & Van Gossum, 2013). More general reports indicate malnutrition amongst the community living older population is likely to be 8–10% (British Association of Parenteral and Enteral Nutrition (BAPEN), 2006; McCormack, 1997; Rist et al., 2012). The implications for this malnourished group on entering hospital includes longer recovery time, greater susceptibility to infection and medical complications as well as significantly longer length of hospital stay leading to greater cost of care (Hickson, 2006; Isabel, Correia, & Waitzberg, 2003; Middleton, Nazarenko, Nivison-Smith, & Smerdely, 2001). In the community, it can lead to decreased mobility, depression as well as an increased likelihood of other illness and falls (Hickson, 2006; Johansson et al., 2009; Visvanathan et al., 2003; Visanathan et al., 2004).

With the ageing Australian population, many older people in the community live alone. In 2011, 50% of people 65–84 years and 34% of those aged 85 years and over lived alone (Australian Institute of Health and Welfare, 2012, p. 11). These percentages are projected to remain constant over the next 20 years while the number of those aged 65 and over living alone in Australia will almost double to 1.45 million people. The packaging industry recognise this shift to single 'grey' households (Packaging Council of Australia, 2013) with the development and increasing availability of 'easy-opening' packaging, single portion products and individual microwaveable meals. 'Easy-opening', however, is often a marketing term rather than a reality for many consumers. Traditional design criteria consider the user capabilities of the majority (95%) of the total population, rather than universal design (Berns, 1981; Yoxall et al., 2006). Universal design is considered inclusive in that this design approach allows the product to be used by the most possible users in a variety of environments (Wegge & Zimmerman, 2007).

Researchers have investigated accessibility issues with food packaging, mostly concentrating on opening jars with vacuum lug closures (VLC) and determining how much force the user required to open the lid (Yoxall et al., 2006, 2008), as well as biomechanical analysis with motion capture (Fair, Bix, & Bush, 2008). The size, shape and texture of the package has been found to determine the grip to be adopted – lateral pinch grip for small lids such as water bottles, tip or chuck (3 point) pinch for thin film and flexible packaging such as individual serves of yoghurt, cheese and biscuits. (Rowson & Yoxall, 2011).

While much of this research has focussed on biomechanical

aspects of opening packaging, a few researchers have also reviewed user satisfaction. Pousette, Löfgren, Nilsson, and Gustafsson (2014) surveyed users from different age groups and found the key factor informing satisfaction with packaging was the ease of opening. A Japanese consumer survey found that users preferred packs that required low levels of strength to open, could be opened without a tool and the method needed to open the pack was easily understood (Kozak, Terauchi, Kubo, & Aoki, 2003). Mixed methods packaging studies include a previous study of hospitalised older adults (Bell et al., 2013) and a recent study by Hensler, Herren, and Marks (2015) investigating the issues of peelable supermarket meat packaging and patients with hand disorders to determine a more efficient seal design.

The previous research conducted in NSW hospitals highlighted problems for older patients opening packaged products used in food service delivery through a combination of observation, self-report and grip and pinch strength measurement (Bell et al., 2013). The study reviewed a limited range of hospital food and beverage items with 24 subjects in the hospital environment, finding relationships between grip and pinch strength and efficient opening of tetra packs, cereal packs and biscuit portions. While water bottles in the hospital study were described as impossible to open by 40% of survey respondents, no significant correlation with grip strength was found, despite the reasons for difficulty being attributed to strength (Bell et al., 2013). Further research into the relationship between hand and finger strength of older people and efficient opening of food and beverage packs used in NSW hospital food service would be useful to examine this issue more fully and explore pack openability with older users generally.

The purpose of this study, therefore, is to comprehensively assess the full range of hospital food and beverage packs with well older people (aged 65 years and above). Well older people (aged 65 years and above) were selected as subjects as the results of the previous study with hospitalised older adults may have been affected by subject's health status and competing demands of the hospital environment. The aim of this community study was to determine if well older people living independently at home have difficulty opening packaged foods commonly used in NSW hospitals and to gain further insights into the older person/pack interaction and the role of hand strength in pack opening. This research will inform better product selection and design that would enhance nutritional intakes.

2. Methods

This study used an ergonomics research methodology, integrating qualitative and quantitative methods in order to triangulate data to more fully understand pack 'openability' (Hignett & Wilson, 2004; Wilson, 2000). Integrated qualitative and quantitative approaches to research have been found to be '...the most comprehensive and productive approach to health and human service research.' (DePoy & Gitlin, 1998; p. xii).

2.1. Participants

This study included a non-probability convenience sample of 40 well older men and women living in three community locations in regional NSW, Australia. Criteria for joining the study were that participants were over 65 years of age, had no cognitive impairment or upper limb weakness, were living independently in the community and preparing their own meals. This judgemental sampling included snowballing recruitment methods through involvement of community groups and consequently, the subjects were a self-selected group and may not be representative of the wider population. An over-representation of women (68% of the

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