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**Patient perceptions of the role of nutrition for pressure ulcer prevention in hospital: an interpretive study**

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The authors declare no conflict of interest.

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### **Authorship**

Shelley Roberts: Conception and design of the study; collection, analysis and interpretation of data; drafting and revision of manuscript; and approval of final version of manuscript.

Wendy Chaboyer and Ben Desbrow: Conception and design of the study; analysis and interpretation of data; drafting and revision of manuscript; and approval of the final version of the manuscript.

## ABSTRACT

**Purpose:** The aims of this study were to explore (a) patients' perceptions of the role of nutrition in pressure ulcer prevention; and (b) patients' experiences with dietitians in the hospital setting.

**Methods:** In this interpretive study, adult medical patients at risk of pressure ulcers due to restricted mobility participated in a 20 to 30 minute interview using a semi-structured interview guide. Interview questions were grouped into 2 domains; perceptions on the role of nutrition for pressure ulcer prevention; and experiences with dietitians. The recorded interviews were transcribed and analysed using content analysis.

**Results:** The sample comprised 13 females and 7 males. Their mean age was  $61.3 \pm 12.6$  years (mean  $\pm$  SD), and their average hospital length of stay was  $7.4 \pm 13.0$  days. Within the first domain, 'patient knowledge of nutrition in pressure ulcer prevention', there were varying patient understandings of the role of nutrition for prevention of pressure ulcers. This is reflected in 5 themes; (1) recognizing the role of diet in pressure ulcer prevention; (2) promoting skin health with good nutrition; (3) understanding the relationship between nutrition and health; (4) lacking insight into the role of nutrition in pressure ulcer prevention; and (5) acknowledging other risk factors for pressure ulcers. Within the second domain, patients described their experiences with and perceptions on dietitians. Two themes emerged, which expressed differing opinions around the role and reputation of dietitians. These included (1) receptive of dietitian input; and (2) displaying ambivalence towards dietitians' advice.

**Conclusions:** Hospital patients at risk for pressure ulcer development have variable knowledge of the preventive role of nutrition. Patients had differing perceptions of the importance and value of information provided by dieticians.

*Keywords:* Pressure ulcer, prevention, patient knowledge, nutrition.

## Introduction

Pressure ulcers (PU) are associated with significant costs to both patients and the health care system<sup>1,2</sup>. Issues such as pain, discomfort, decreased mobility and independence, wound exudates and odour, social isolation, and poor body image have been described by individuals who have experienced PU. In the hospital setting, PU are associated with an increased risk of complications and lengthy healing times, resulting in longer length of stay (LOS) and higher hospital costs<sup>(1-6)</sup>. In the Australian public hospital setting, PU increase LOS of acute admissions by a median of 4.3 days, and economic evaluation has estimated that AUD\$285 million per year of opportunity cost (measured in bed days alone) was lost due to PU in 2001-02<sup>(7)</sup>. In the UK, the estimated annual cost of treating PU to healing time in hospital and long-term care settings was £1.4 – 2.1 billion in 1999/2000<sup>(8)</sup>. Clearly, the patient burden and hospital costs associated with PU in the clinical setting are significant, and preferably avoided through effective pressure ulcer prevention (PUP).

Historically, risk factors such as pressure, moisture, shearing forces, and friction have been a primary focus for PUP<sup>(9-11)</sup>. In addition, research suggests that malnutrition is an important risk factor for PU development. It is associated with an odds ratio of 2.6 (95% confidence interval 1.8 – 3.5,  $p < 0.001$ ) of developing a PU in the public hospital setting in Australia<sup>(12)</sup>. Current evidence suggests that oral nutrition support for patients at risk of PU is effective in reducing the incidence of PU development by approximately 26%, resulting in substantial cost savings when modelled using Australian hospital data<sup>(13)</sup>. However there is no evidence to date that a dietician consultation is associated with a reduction in PU risk.

Hospitalized patients often fail to eat enough to meet their estimated energy and protein requirements<sup>(14-16)</sup>. It is crucial, therefore, to improve the nutritional intake of patients

at risk for PU, in order to reduce their risk of PU development. Patients may play a more active role in their nutritional care in hospital if they understand the link between nutrition and PUP. Evidence suggests that patient education around PUP is lacking. A study of patients in 89 institutions in the Netherlands reported that only 14.7% of high PU risk patients were educated about PU causes and prevention strategies<sup>(17)</sup>. To our knowledge, there is currently no data on patients' understandings around nutrition in PUP, or around patients' experiences with and opinions of dieticians, who are the health professionals likely to provide nutritional education in the hospital setting. Therefore, the aims of this study were to explore (a) patients' perceptions on the role of nutrition in PUP; and (b) patients' experiences with dieticians. Understanding patients' perceptions around nutrition for PUP and dietician input in the clinical setting may provide a foundation for targeted interventions to promote good nutrition and prevent PU.

## **Methods**

This interpretive qualitative interview study was a component of a larger, multisite, mixed methods study conducted across 4 medical wards in 2 metropolitan hospitals in Southeast Queensland, Australia. Both of these hospitals have established PUP programs, and PUP strategies have been implemented into regular clinical practice. Ethical approval for study procedures was obtained through Queensland Health (reference number HREC/11/QTHS/111) and Griffith University (reference number NRS/40/11/HREC). All participants signed a consent form prior to data collection.

The sample comprised adult medical patients cared for in four inpatient medical units who had reduced mobility (i.e. bed-bound, wheelchair-bound, or requiring a mobility aid or physical assistance) and were therefore deemed at risk for PU development. Reduced

mobility was chosen as a conservative inclusion criteria to identify patients at risk of PU, as it is a widely recognised risk factor and strong predictor of PU in the clinical setting<sup>(3, 5, 18)</sup>.

Participants were eligible for inclusion if they could provide consent (aged  $\geq 18$  years, cognitively intact), had a hospital length of stay (LOS) of  $\geq 3$  days, and met the criteria for reduced mobility. The study sample was selected using a maximum variation purposive sampling technique (i.e. a mix of men and women, younger and older patients, patients with and without experience with PU)<sup>(19)</sup>.

### **Data collection**

Individual patient interviews were conducted on the ward, in a quiet area and at a time convenient for the patient. The interviews lasted 15 to 30 minutes. Using a semi-structured interview guide, patients were asked about their perceptions of the role nutrition may play in PUP and their experiences with and opinions on the role of dietitians. A total of three nutrition related questions were asked. They were based on the literature review and current clinical practice guidelines, which suggest that nutritional intervention and education are important components of PUP. Prompts were used to gain additional information as required. Individual interviews were conducted by a research assistant with experience in qualitative data collection. Interviews were recorded with a handheld digital recording device, and transcribed for analysis.

### **Data analysis**

The interviews were analysed using inductive content analysis, which provides a systematic and objective means to make valid inferences from verbal data in order to describe and quantify phenomena<sup>(20-22)</sup>. This technique takes into account meanings, intentions, consequences, and the context in which data was collected<sup>(20)</sup>. Because the interview



questions encompassed 2 domains (knowledge of nutrition in PUP and experience with dieticians), data from each interview were analysed in relation to these domains. To become familiar with the data, transcripts were read and reread, and notes were taken by two of the authors. For each domain, codes were developed from the verbatim statements of participants, which were then grouped into sub-themes identified from the data. Sub-themes were then classified into themes within each domain. Frequent discussion among the research team ensured that the codes accurately reflected the data, and that the themes and sub-themes adequately encompassed the data.

Trustworthiness of findings in qualitative data analysis is often considered in relation to credibility, dependability and transferability<sup>22</sup>. We used purposive sampling ensured a broad representation of patients, and regular meetings with the research team ensured codes, sub-themes and themes accurately reflected the data for transferability and credibility. A code book and memos were written to document the analytic process including decisions about emerging sub-themes and themes, providing an audit trail of the analysis.

## **Results**

The sample comprised 13 females and 7 males. Participants mean age was  $61.3 \pm 12.6$  years (mean  $\pm$  SD, range 24 – 80 years), and their mean hospital LOS was  $7.4 \pm 13.0$  days (range 3 – 62 days). After 16 interviews, no new information was emerging, however four more interviews were undertaken to ensure data saturation. Within each domain a number of themes emerged. A summary of the domains, themes and sub-themes is provided in Table 1.

### **Domain 1: Patient knowledge of nutrition in PUP**

The domain ‘patient knowledge of nutrition in PUP’ had 5 themes, which express patients’ perceptions of the role of nutrition for preventing PU. Consistent with inductive approaches to qualitative analysis, we did not identify an overarching theme, nor was any theme prioritised over the others as each provided a unique perspective. Also, we did not count frequencies of emerging themes.

The first theme was “recognizing the role of diet for PUP.” Participants acknowledged that nutrition as important for prevention of PU. Nevertheless, while most patients thought that nutrition played a role in prevention, they were unsure exactly what that role was. As one stated, *“I’m not a dietician and I’m not a medical expert, but I would suggest that nutrition is very, very important.”* Some patients stated that consuming a poor diet will result in a higher likelihood of developing a PU. Other patients described a good diet as being a protective factor for PU, and weight loss (in the buttocks area) was described as a factor which may increase the risk of PU. *“The good food is building you up all the time, and you may even be putting on weight. And it’s usually when someone loses a lot of weight in their bottom area that these things happen quicker. The skin comes apart quicker. Whereas with well padded bottoms, it takes a while to happen.”*

Losing weight if overweight or obese was also described as a measure for PUP and healing. One patient thought that consuming ‘heavy foods’ in hospital would lead to patients feeling full and heavy, encouraging them to stay in bed rather than resuming mobility. Another patient, unsure of the role that nutrition played in PUP, supposed that nutrition affects your blood, and if your *“blood’s out”* (i.e. blood test results abnormal) you may be more likely to develop PU. On the whole, this theme reflects patients’ recognition that nutrition plays a role in PUP, but the description of that role was ambiguous.

The second theme, ‘promoting skin health with good nutrition’ portrays how patients made the link between skin health and nutrition, even if they did not fully understand the mechanisms behind it. Some participant made general statements that nutrition was related to skin health, while others said that poor nutrition would cause skin to break down more easily. Several participant mentioned dietary protein as an important factor for skin integrity. Protein was also mentioned as important for wound healing and prevention of infection. One patient thought that fluid intake would play a role in PUP; however they were unsure of its exact role. Although respondents did not articulate the exact relationship between nutrition and skin health, they appeared to have a broad understanding of this notion. One respondent noted, *“I should assume that if you weren’t eating properly, and aren’t getting the right nutrition, of course your skin’s going to break down twice as much.”* Another observed, *“You need vitamins and minerals and proteins in the right ratio so that your skin, your body tissue maintain its intactness, because if it doesn’t maintain intactness, then you’re prone to infection.”*

The third theme, “understanding the relationship between nutrition and health” describes the perception that nutrition was important for health in general, and would be expected to play a role in PUP. As one participant articulated, *“I know nutrition is important for all areas of health, and so it would have a part to play with pressure sore prevention.”*

The fourth theme ‘lacking insight into the role of nutrition and PUP’ depicts the lack of understanding or knowledge of a relationship between nutrition and PUP expressed by some participants. Some respondents stated they had “no idea” how nutrition and PUP may be related, and others reported they had not given this potential connection much thought before. One respondent related, *“I’ve got no idea, really. No, none whatsoever.”* Another

observed, *“I don’t think nutrition plays a role in bed sores... I don’t think it’s to do with nutrition. I wouldn’t have thought so anyway.”*

The final theme in the knowledge of nutrition and PUP domain was ‘acknowledging other risk factors for PU’. Within this theme, patients described other risk factors they considered to be of importance for PUP. These were skin health, age, pressure, shear and friction, and co-morbid conditions. Skin health and integrity was mentioned most frequently, but no link was made between skin health and nutrition. Keeping skin healthy was described as an important way to prevent PU, and patients mentioned delicate or thin skin as a associated with vulnerability to pressure ulcer development. Age was identified as a factor affecting skin health and integrity. Participants noted that aging is linked to more fragile skin that is prone to skin tears. The combination of older age and medications such as warfarin were linked to fine skin that bruises, tears, and bleeds easily. Participants also acknowledged that older patients should be monitored for PU because they are at high risk. Pressure on the body associated with lying/sleeping positions and prolonged time spent in bed were described as factors involved in the development of PU. Several participants stated that... *“heels rubbing on the bed”* acted as a risk factor for PU development. Finally, participants attributed various illnesses were identified as an important factor in PU development. As one participant noted, *“I think it’s to do with the patient, what’s wrong with them, and the way they lie.”* Another stated, *“Well the main reason [for developing a PU] is pressure on the body from the bed and the angles you sleep.”* A third respondent observed, *“I tend to think it’s more if the skin’s thin-ish and delicate.”*

## **Domain 2: Patient feedback on dieticians**

The second domain ‘patient feedback on dieticians’ comprised two themes, describing patients’ experiences with and perceptions of dieticians. These included (1) receptive of dietician input; and (2) displaying ambivalence towards dieticians’ advice.

The theme “receptive of dietician input” describes positive experiences during interactions with dieticians. These participants expressed willingness to participate in nutritional education and gratitude towards dietetic input. They tended to describe dieticians as happy and bright, and felt appreciative of the information and services they provided. As one respondent noted, *“I’m lucky enough to have been referred, to a dietician.”* Similarly, another stated, *“It had just so much information; leaflets and talking to the nutritionist, it was lovely.”*

In contrast to theme one, the theme “displaying ambivalence towards dieticians’ advice” reflects conflicting views of the value of dietetic advice. Some participants expressed the opinion that they did not need to see a dietician, primarily because they already knew how and what to eat to keep healthy. Some stated that the need to consult with a dietician never crossed their minds, while others stated that meeting with a dietician was necessary only if diagnosed with a disease that required a special diet. One respondent described the need for a dietician, *“...only if I needed it. Well, if I had any sort of diseases or sicknesses that needed, um, to be on certain diets, I’d be interested then. But for, like, everyday life I’ve got a fair idea what’s good for me and what isn’t, you know. So not really, no.”* Another patient reported that an appointment with a dietician did not meet her expectations; she further stated that she left this appointment feeling disempowered. This participant also discussed receiving conflicting advice between the dietician and her diabetes specialist. *“She (dietician) was telling me things that were in opposition to what my specialists were telling me. (Specialist): ‘You need to lose weight’. (Dietician): ‘No, you won’t be losing weight. When you’re diabetic*

*you put weight on*'. Other participants thought that they did not learn anything new from their dietician as compared to nutritional information gained from everyday life. As one participant opined, "*Well, she [dietician] didn't provide me with anything I didn't already know. I was quite bored.*" Some stated they did not like the diet they were prescribed, or disliked restrictions on certain foods, resulting in discontinuation of their prescribed diet.

## **Discussion**

This study is the first to our knowledge to explore knowledge of the role of nutrition for PUP among patients at risk for PU development. Participants were patients at two Australian hospitals where both PUP and patient education were important parts of clinical practice, and it was initially postulated that their knowledge of the importance of nutrition in PUP would be adequate. Instead we found variable levels of understanding of the role of nutrition in PUP. As some patients had a history of PU, or had experience of PU through family members, this may have influenced their perceptions around nutrition for PUP and the importance of dieticians. In fact, they may have particular insights because of their experiences. Based on findings from this study, we concluded that patients had inadequate knowledge of nutrition and PUP, despite well developed programs that include consultation with a dietician and appropriate counselling. We therefore recommend additional education focusing on PUP that includes the role of nutrition for all patients deemed at risk for PU development.

Based on the variable levels of knowledge expressed by study respondents, we also recommend individual patients assessment to determine their knowledge, and motivation to learn and be involved in their care. Research suggests that basic literacy levels in adults may not be sufficient to understand oral or written information regarding their medical condition

and health care<sup>(23)</sup>. This highlights the importance of considering health literacy when planning patient education. Health literacy is defined as an individual's capacity to obtain, process and understand information and services needed to make appropriate health decisions<sup>(24)</sup>. Health literacy in the hospital setting is especially important since education must be delivered in a setting of an acute illness. A study based in the United States found that 81% of English speaking patients over 60 years of age lacked adequate health literacy to make informed decisions about their health care<sup>(25)</sup>. Researchers have also reported that patient education materials and consent forms in hospital are often above patients' reading levels, rendering their comprehension even more challenging<sup>(26-29)</sup>. We recommend consideration of patients' education, literacy levels, and prior knowledge of nutrition when planning education for acutely ill persons at risk for PU development.

Participants in this study expressed differing perceptions of the importance and value of information provided by dietitians. Some patients expressed their gratitude towards dietetic input in the hospital setting, but others deemed it unnecessary. This suggests that the role and importance of dietitians is somewhat unclear to patients in the hospital setting, and may affect patients' responsiveness to PUP programs using nutrition education as an intervention strategy. That is, in order for their successful uptake, new innovations must be compatible with individuals' values, beliefs and current needs; and be perceived as feasible and beneficial<sup>(30)</sup>. This finding is consistent with previous studies exploring staff perceptions on the role of clinical dietitians<sup>(31, 32)</sup>. A study conducted at a public hospital in Queensland, Australia used thematic analysis to explore staff perceptions around nutrition care<sup>(31)</sup>. Among nursing and allied health staff such as pharmacists, speech pathologists, physiotherapists and occupational therapists, the role of hospital dietitians was unclear and there were mixed views on whose responsibility it was to identify and provide nutritional care to malnourished

patients<sup>(31)</sup>. Similarly, a cross-sectional survey of 237 internal medicine physicians and clinical dieticians in Michigan found that most responses to questions around the role and responsibilities of dieticians differed between professions<sup>(32)</sup>. If the role of dieticians is unclear among clinicians involved in PUP and wound care, it is not surprising that patients lack an adequate understanding of how consultation with a dietician may provide benefit for prevention of PU development. Whilst there is no evidence around the effectiveness of dietary counselling in PUP or management of malnutrition in hospitals,<sup>(33)</sup> nutrition education may be an important component of PUP programs. This is reflected in international PUP guidelines, which suggest that patient education is an important aspect of PUP<sup>(34, 35)</sup>. Clearly there is a need for further research around the effectiveness of patient education for PUP.

Some patients displayed a lack of confidence in dieticians, suggesting they hadn't learned anything new from the dietician, disliked the diet plan, or thought the information was in contrast with information given by their medical specialist. Whilst dieticians are experts in nutritional care, recent research suggests that general practitioners are the most recognised health professional providing nutritional care to patients with chronic disease in Australia, followed by dieticians<sup>32</sup>. Although this study was based in the primary care setting, it highlights the importance of having concordance between the information provided by all health professionals, including those within the hospital setting such as doctors, nurses, dieticians and other allied health care providers.

## **Recommendations**

Three main recommendations arise from this study. We found that patients at risk of PU development expressed varying levels of knowledge of the role of nutrition in PUP, and require tailored education in this area, taking into account their health literacy. We



hypothesize that tailored education may raise patients' knowledge of nutrition and PU development and increase their participation in their nutritional care. We also recommend clarification of the role of dieticians in the clinical setting, as patients appear to lack an understanding of the potential health gains to be made from dietetic input and nutritional care in hospital. A better understanding of this role and its importance in PUP may increase patients' responsiveness to dietetic input and participation in their nutritional care.

### **Limitations**

Interview questions were asked after each patient had participated in an observational study targeting the patients' role in PUP. As patients knew their oral intake was being monitored, their awareness of a potential role of nutrition in PUP may have been increased, influencing results of this study. Participant's clinical conditions may have influenced their responses. We sought to minimize this potentially confounding influence by ensuring interviews were conducted when patients felt well enough to participate, ensuring patients remained comfortable during the interview, and informing participants that the interview may be ceased at any time if they felt tired or distressed. Another potential limitation is that analysis occurred several months after data collection, therefore member checking was not possible as patients had been discharged from hospital. Selection bias is a consideration in any research. In qualitative research, purposive sampling is used to achieve variation in the experiences being explored and in this study, recruitment occurred until data saturation was reached<sup>(19)</sup>. It is always possible some views were not represented in our sample.

### **CONCLUSION**

Findings from this study suggest that patients at risk of PU have conflicting views on the role of nutrition in PUP. Owing to the compromised nutrition seen in many persons at

risk for PU development we believe that selected patients will benefit from nutritional education aimed at PUP that is tailored to suit their literacy levels. A better understanding of the role of dieticians within the clinical setting, may improve patient participation in their nutritional care, and associated outcomes.

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Table 1: Description of domains, themes and sub-themes

Domain	Theme	Sub-theme
Patient knowledge of nutrition in PUP	Recognising the role of diet in PUP	<ul style="list-style-type: none"> <li>• Nutrition probably plays a role in PUP</li> <li>• Poor diet / weight loss (in bottom area) is a risk factor for PU</li> <li>• Good diet / weight gain (when underweight) is a protective factor for PU</li> <li>• “Heavy food” may reduce mobility</li> <li>• If overweight, losing weight is important for PUP and healing</li> </ul>
	Promoting skin health with good nutrition	<ul style="list-style-type: none"> <li>• Nutrition plays a role as it is related to skin health</li> <li>• Poor nutrition would cause skin to breakdown more easily</li> <li>• Protein, vitamins, minerals maintain skin/tissue integrity and prevent infection</li> <li>• High protein diet for skin integrity and healing</li> <li>• Fluid intake may play a role (unsure what)</li> </ul>
	Understanding the relationship between nutrition and health	<ul style="list-style-type: none"> <li>• Nutrition is important for all areas of health, so it would have a role in PUP</li> <li>• Nutrition would play a role as it is the wellbeing of the body</li> <li>• Better nutrition results in better health and circulation</li> <li>• If you have a healthy body you won’t get PU as bad</li> </ul>
	Lacking insight into the role of nutrition in PUP	<ul style="list-style-type: none"> <li>• Unsure how nutrition and PUP may be related</li> <li>• Has not thought about nutrition as a factor in PUP</li> <li>• Doesn’t think nutrition has a role</li> </ul>
	Acknowledging other risk factors for PU	<ul style="list-style-type: none"> <li>• Main issue is skin integrity</li> <li>• Pressure, positioning, medical conditions are important risk factors for PU</li> <li>• Friction / shear as a risk factor</li> <li>• Skin health is important</li> <li>• Age and medications affect skin health</li> <li>• Older patients are at risk</li> </ul>
Patient feedback on	Receptive of dietician input	<ul style="list-style-type: none"> <li>• Feels lucky to be seen by dietician</li> <li>• Appreciates nutritional information provided</li> <li>• Dieticians are happy and bright</li> </ul>

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dieticians	Displaying ambivalence towards dieticians' advice	<ul style="list-style-type: none"><li>• Patient doesn't think they need to see a dietician</li><li>• Already knows how to eat</li><li>• Dietician appointment did not meet expectations</li><li>• Patient felt disempowered</li><li>• Conflicting advice from dietician and specialist</li><li>• Did not gain any new knowledge from dietician</li><li>• Did not like prescribed diet</li></ul>
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