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Title: Community Nurses' judgment and decision making for managing venous leg ulceration: A Judgement Analysis.

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We explored how community nurses manage the uncertainty associated with diagnosing and treating venous leg ulceration. Despite being an important part of community nurses' workload (Posnett and Franks, 2008), quality of diagnosis and treatment is variable and often below that which should be expected (Royal College of Nursing, 2008, Srinivasaiah et al., 2007, Vowden and Vowden, 2009).

We took a Brunswikian approach because clinical judgement occurs in uncertain environments which bear little resemblance to controlled experimental settings. We sought to understand the relationship between the nurses, the cues in the clinical environment, and their judgement accuracy (Goldstein, 2007). Leg ulcer management involves tasks such judging whether to carry out certain tests, interpreting the results, how to present information to the patient, and when to commence therapy. Accuracy was likely to depend on a nurse's ability to prioritise relevant information and disregard the irrelevant (Cooksey, 1996).

We used Judgement Analysis to explore the performance of 36 community nurses. In order to achieve a representative sample of judges (Cooksey, 1996) we recruited 18 tissue viability specialist nurses and 18 generalist community nurses who made these sorts of judgements in real life and thus had a high level of familiarity with the task. Task congruence was assured by creating a representative sample of the clinical environment. This was using 110 clinical scenarios generated from real patient cases. The proportions of different types of leg ulcer mirrored the UK leg ulcer population and each written scenario was accompanied by a photograph of the wound to add visual information.

The nurses viewed the scenarios online and made a diagnosis and a treatment judgement for each scenario. These judgements provided the data for the subject side of a double system lens model (Cooksey, 1996). A nominal group (Black, 2006) consensus panel was formed which consisted of four community tissue viability nurses with advanced relevant clinical and research experience. These nurses were asked to independently complete the judgement task before they met for the consensus panel. At the consensus panel meeting they were presented with each scenario, informed of their range of individual answers and asked to agree a group answer. Any disagreements were resolved by discussion. These consensus judgements were used to provide the 'ecology' data for the left side of the lens model.

Logistic regression models were constructed to examine nurses' use of the information in the scenarios (Cooksey, 1996, Stewart, 2004). Differences between generalist and specialist tissue

viability nurses and between nurses with different levels of education were explored using paired t-testing and ANOVA (Field, 2005).

R_e for diagnosis was 0.63, indicating that the nurses could be reasonably expected to have an R_a of up to 0.63. The nurses achieved an overall accuracy of 0.48. For the treatment judgement, the predictability was 0.88 so there was less uncertainty, but the nurses achieved an accuracy of only 0.49. For both judgements, the specialist nurses were more accurate than the generalist nurses. Level of education was not a predictor of better accuracy.

The nurses gave the appropriate weight to the most important diagnostic cue but under-weighted other important cues and over-weighted less important cues. For the treatment judgement, the nurses gave insufficient weight to the most important cues but over-weighted less important cues.

In this study the judgements of both generalist and specialist community nurses were not as accurate as they could be. It was particularly surprising that treatment judgements were no more accurate than diagnosis judgements, despite there being less uncertainty in the treatment clinical environment. This might be related to the cue weights but this does not explain why specialist nurses were more accurate than generalist nurses.

Our study is innovative in being the first judgement analysis study to focus on tissue viability, community nurses and the impact of expertise on the management of leg ulceration. Our study is also the first judgement analysis study in nursing to use photography to enhance representativeness. The use of computerised simulation enabled the presentation of a larger number of scenarios than standard methods would have permitted, thus we were able to generate more stable logistic regression estimates. We don't know whether digital presentation impacted on participants' performance. Future Judgement Analysis studies might like to consider the trade off between presenting sufficient scenarios to achieve stable logistic regression estimates and the demands on the participants associated with the manner in which the scenarios are presented. We also used a much larger number of cues than the 7 (+) cues recommended for Judgement Analysis research (Cooksey, 1996, Miller, 1956). It has been suggested that even when many cues are available, participants typically use fewer than 10 cues (Roose and Doherty, 1976). The results of this thesis support these findings.

This study exposed the complexity of the clinical environment surrounding the management of leg ulceration and to set out models for diagnostic judgment and treatment choices for venous leg ulceration. These models provide a starting point for developing robust strategies for supporting community nurses' judgement and decision making. Such strategies will require investigation to assess their potential usefulness but they offer the possibility of more clinically and cost effective care for patients with venous leg ulcers.

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