

# The impact of podiatric education for ward nurses: A pilot study

Tracey Clay

Research into the delivery of diabetes care, including training and education of healthcare professionals, is often complex and multifactorial. The environment of a hospital ward is subject to constant change and yet is one in which the primary objectives are to maintain and improve the health of the patients within it and to arm the staff with the educational tools to provide appropriate care. The results from this pilot study present information relating to the knowledge of basic podiatric care of ward nurses before and after educational intervention.

The nature of nursing and the role of the nurse has long been the subject of debate throughout the UK. This has been the case particularly with the discussion of extending the range of nursing responsibilities with resultant legal and professional implications. The rationale for this shift in direction are the changing demographics, changing patterns of disease, patient empowerment and trends in the way services are delivered.

Nurse education, both pre- and post-registration has meant that nurses are educated to a higher level and an increasing number are extending and expanding their roles into areas traditionally dominated by doctors (Mullally, 2004). Despite lower limb amputations being known to have profound effects on patients, the patients' family and the healthcare economy there is limited evidence-based literature addressing diabetic foot care on which nurses extending into this field can draw upon.

## Prevention of amputation

The St Vincent Declaration (WHO Europe and IDF Europe, 1989) called for a 50% reduction in diabetic foot amputations, reflecting the belief that much morbidity is preventable by better patient management. The financial and human cost of foot ulcers in people with diabetes is well documented (Apelqvist et al, 1995; van Houtum, 1995 Ramsey et al, 1999; Gordois, 2003) and more recent studies echo the benefits of diabetic foot ulcer prevention (Boulton and Armstrong, 2003; Boulton et al, 2005; Singh et al, 2005).

The *National Service Framework for Diabetes: Standards* (NSF; DoH, 2001) includes hospital care among its 12 standards: those who are admitted to hospital will receive effective care of their diabetes and, wherever possible, will continue to be involved in decisions concerning the management of their diabetes. For nurses, who have the responsibility for day-to-day management of people with diabetes in the hospital setting, this standard is both a welcome

## Article points

1. Ward nurses are the main carers for hospitalised patients with diabetes and foot ulcer prevention through this group could improve clinical outcomes.
2. There is limited research in the field of podiatric educational interventions for ward nurses.
3. This pilot study tested the design and use of a questionnaire to assess knowledge levels before and after education.

## Key words

- Diabetic foot
- Ward nurse
- Education

Tracey Clay is currently a Diabetes Clinical Support Nurse for Novo Nordisk working in Yorkshire and has recently completed an MSc in Diabetes Care. When carrying out the trial she was a DSN in Lincolnshire.

### Page points

1. Despite political intervention and systematic evidence reviews, diabetes care remains fragmented.
2. A lack of awareness in non-podiatry staff of the important contribution podiatrists could make in preventing the occurrence and exacerbation of ulcers is suggested as one of the causes of delayed referral of diabetic foot ulcers.
3. A pilot study was designed to assess podiatry knowledge in ward nurses before education, after education, and in those who were not given education.

spotlight and a challenge.

The thrust of diabetes and its complications into the political arena in recent years (DoH, 2001; DoH, 2002; DoH, 2003; NICE, 2004) and awareness campaigns driven by Diabetes UK, for example, have assisted in raising the profile of diabetes. Systematic reviews of the evidence have formed the basis of treatment decisions, prevention of complications and patient-focused education packages. Yet, in the author's opinion the current care for the person with diabetes is fragmented. There are continuing professional development opportunities for diabetes nurses; however, due to restructuring of strategic health authorities and PCTs, staff often find it difficult to be released from their clinical duties in order to study.

### Rationale for the study

There appeared to be a lack of awareness in non-podiatry staff at the author's hospital of the potentially important contribution that podiatrists could make to prevent the exacerbation of ulcers. Anecdotal evidence suggested that a delayed referral, possibly due to lack of nurse awareness of the need for urgent referral, could have resulted in ulceration and amputation. Given that nurses are the main carers for hospitalised people with diabetes, it therefore seemed to be a logical hypothesis that foot ulcers could be prevented by increasing nurse education.

This pilot study was carried out in order to assess any problems with layout, grammar, appropriateness and time taken to complete the questionnaire. Collins (1999) and Jankowicz (2000) suggest that such pilot studies can test a number of other points, including the ability of the study to analyse the data received as well as the appropriateness of methods, techniques used, sampling size, the target group and guidance for completion.

It is important to assess the effectiveness of the questionnaire in gaining answers to the questions asked. This helps to reduce bias by avoiding the use of leading questions and helps with clarity of the questions (Parahoo, 1997). Reliability can be tested with repeat

administration of the questionnaire (LoBiondo-Wood and Haber, 1998).

Increasingly, health service research uses standard questionnaires designed for producing data that can be compared across studies. However, a search of databases (Medline, Cochrane Library, CINHAL, BNI and Google scholar) yielded no comparable framework for this area of research and hence the development of a unique questionnaire was warranted.

### Study design

A randomised controlled trial design was chosen as this has become the gold standard for establishing evidence of causal associations. The randomisation was performed by the author's Trust's research and development department to ensure internal validity.

There were two self-administered questionnaires measuring knowledge and attitudes of staff at two points in time. The target population was a convenience sample that would incur a high response rate at minimal expense.

### Inclusion criteria

- All registered general nurses of grades C, D, E, F and G.
- Permanent employment by the acute trust.
- Working in the location of the acute trust.

### Exclusion criteria

- Registered general nurses below grades C and above H.
- Non permanent staff.
- Nurses from specialist units.

### Sample size

Sample size calculations were determined to discover what constitutes an 'educationally important difference' between the immediate and delayed education treatment groups. A sample size of 32 participants (16 in each group) was required to give 80% power to detect a single standard deviation difference (Torgerson and Torgerson, 2005). Consent was granted through the voluntary return of the completed questionnaire. Financial support

was granted by the Trust's research and development department.

### Data collection

The data collected consisted of structured and unstructured answers to questions. Factual information required a tick box response and was precoded to yield some nominal data for simple analysis. The second part of the questionnaire took the shape of a Likert Scale relating to the participants' perceived knowledge of diabetes and podiatry referral. This was followed by an open space for comments. Bowling (2002) suggests that: 'open questions following closed questions are a useful way of probing for clarification of reasons and explanations.' Unfortunately these open questions did not yield suitable data for analysis.

Next was a visual assessment of five common foot conditions. The final questions were given with five-stem multiple-choice answers in order to assess knowledge of diabetes and the at-risk foot. The questionnaire was designed to be completed within 15 minutes.

Discussions took place with all relevant ward managers on site at least 2 months in advance of commencing the study and an overview of the research was provided. The time of year was also taken into account, avoiding the summer and winter holiday periods, as such factors are known to influence response rates (Edwards et al, 2003).

The questionnaire was internally delivered to the wards as this was the most financially viable option. The completed questionnaires were placed in a sealed box. This prevented tampering and helped to ensure anonymity. Arrangements were made for collection two weeks later.

Of the 220 questionnaires posted on the wards there were a low number of returns and to resolve this issue each of the wards were revisited, emails were sent to the ward managers, a flyer was posted on the trust intranet site and a general request was made for completion. The collection boxes were left on the wards for a further period of two weeks and then handed to the investigator for data input.

### Educational intervention

The facilitator-led education consisted of a 2-hour presentation and practical session to the group delivered by a podiatrist and a DSN (neither of whom was the investigator). The facilitator-led education group (n=8) were asked to individually complete the questionnaire again immediately after the education.

The second group (n=10) were sent the second questionnaire three months after initial participation without being given any further education. To ensure that no staff were left disadvantaged after the study, the second group were then mailed copies of the information that was presented to the facilitator-led education group.

### Results

Eighteen completed questionnaires were returned (8.2%). There was an uneven gender split between the randomised groups. In the facilitator-led group 87.5% were female, while in the group without intervention 100% were female. *Figure 1* shows the flow of participants through the study.

When looking at the length of time the participants had been qualified, within the immediate group there was a relatively even distribution. In the delayed group the majority of participants (40%) had been qualified for between 10 and 14 years.

Analysis of previous training concluded that there was not an even split of previous education between the groups: 75% of the immediate education group had no previous training versus 30% in the delayed group (*Figure 2*).

Before the education, the intervention group had a mean number of correct answers of 7.17 (Standard deviation [SD] 1.92) compared to the non-intervention group 9.00 (SD 2.19). Analysis of the means across the two groups showed improvement from between the first and second questionnaire scores of two points, which is a large improvement, however, the confidence intervals are wide (95% CI -2.49 to 1.96). *Table 1* shows a summary of the number of correct answers to the questionnaire and the improvement of scores.

### Page points

1. The data collected consisted of structured and unstructured answers to questions as well as a visual assessment of five common foot conditions.
2. Ward managers were involved in discussions regarding the research and played a role in promoting completion of the questionnaires.
3. The education consisted of a two-hour presentation and practical session.

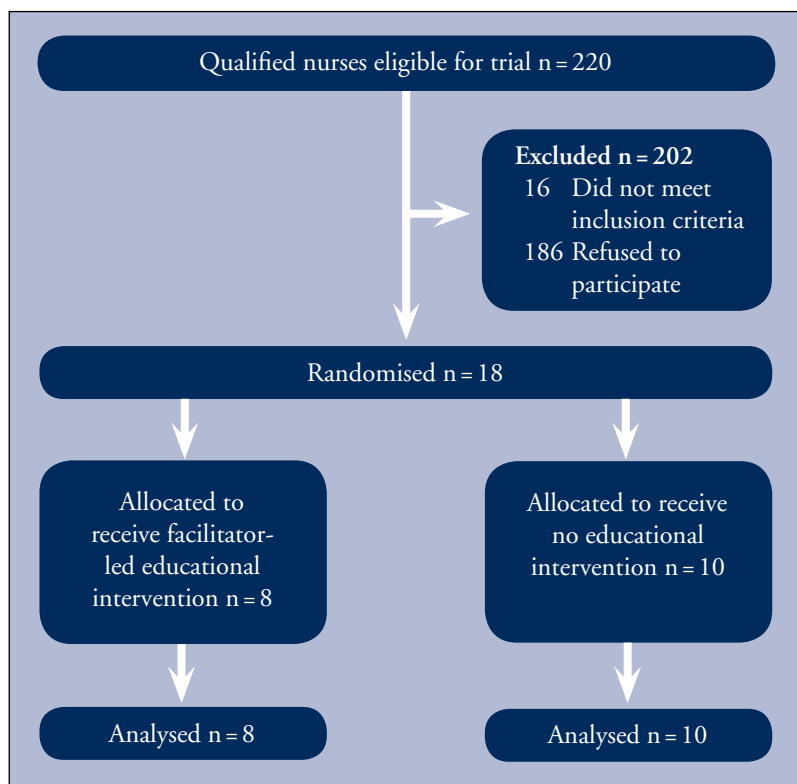


Figure 1. Enrollment and outcomes.

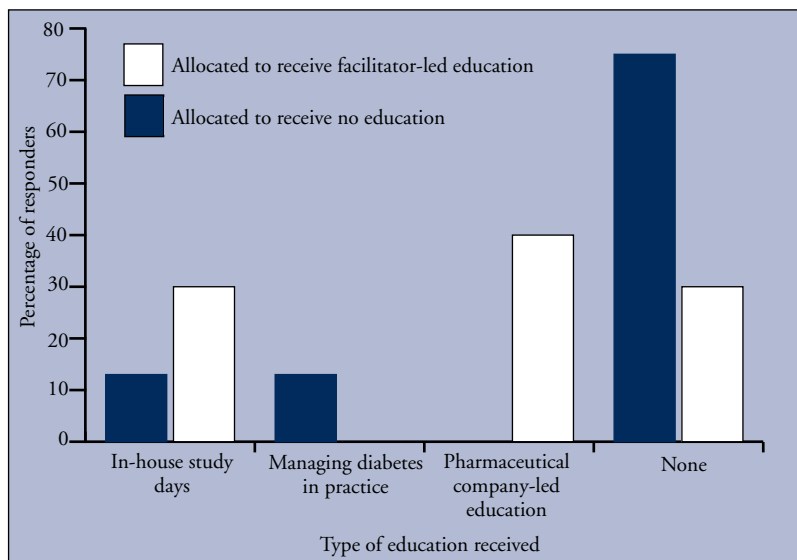


Figure 2: Previous training by participant.

### Discussion

The ultimate aim of this pilot was to test whether a questionnaire could be used to evaluate the knowledge of qualified nurses with regard to the inpatient with diabetes. This

would then enable a full-scale investigation into whether education of ward nurses had any impact on the rate of referral of people with diabetes to podiatrists and the number of amputations. However, the results of this small pilot study found that while education had a small impact on the nurses' questionnaire scores (7% improvement) there was also a similar increase in the group who did not receive the facilitator-led education (11% improvement; see Table 1). In this case, the author attributes this finding to the small sample size.

Only 18 nurses were willing to participate, this has implications for the power of the study as a minimum of 32 participants are required for the investigation to have the power to detect a single standard deviation (Torgerson and Torgerson, 2005). It also highlights that for any subsequent larger trial there would need to be either an increased percentage of responders or a larger number of invitations to participate in order to gain valid statistical significance. This could be undertaken by involving a larger number of hospitals to increase sample size, offering an incentive to encourage participation, revision of the questionnaire format or a combination of all three.

For a full study it would be necessary to avoid cross-contamination between the two groups (nurses educating each other) and so different wards or even hospitals would have to be used, potentially adding confounding factors. Inviting other hospitals to take part in the study would have its own difficulties. One of the interesting points raised by this study is the degree to which nurses disseminate information between each other, as this could explain the similar increases in scores shown by both groups. In a larger study it would be interesting to monitor what the effects on referral rates and the number of amputations, if any, are of nurses educating on podiatric topics.

The reasons for poor response rate were not identified. Edwards et al (2003) performed a systematic review of methods to influence the completeness of the response to self-administered questionnaires. They found the odds of response were at least doubled by using a monetary incentive (odds ratio 1.99,

95% confidence interval 1.81–2.18). This type of incentive was suggested and rejected as coercion by the investigator's trust research and development department. In the interests of patient care and outcomes, and with the benefit of hindsight it could be argued that a monetary incentive should have been used.

There were several ways in which the questionnaire could have been improved; for example the instructions in relation to referral pathway to specialist services were perhaps not explicit and if re-written would be shorter and easier to understand.

### Conclusion

Every 30 seconds a limb is lost to diabetes somewhere in the world (International Diabetes Federation, 2007) and it is evident that research is occurring in the prevention and organisation of foot health. Despite the redefinition of roles in nursing, there is a lack of education on diabetes-related lower limb complications.

While the results of this pilot study showed no significant effectiveness of educational intervention due to the small sample size it cannot be concluded that education has no effect.

Despite being unable to prove the initial hypothesis, the study served its purpose as a pilot by highlighting a number of key areas for consideration in the design of an adequately powered study looking at nurse education with regard to diabetic foot care. Recruitment proved to be the greatest challenge and ways to improve this need to be considered, including adjustments to the questionnaire design.

The methods and interventions used in this study need to be further refined for use in a larger scale trial from which more solid conclusions can be reached. Key learning for the

investigator of this research study are wide and include the development of more efficient and effective research strategies, consideration of the ethical issues involved in research, formatting and questionnaire design, recruitment and incentives, a basic understanding of inferential and descriptive statistics and the ability to identify threats to validity and analyse the strength of the evidence derived from a randomised controlled trial. ■

Apelqvist J, Ragnarson-Tennvall G, Larsson J, Persson U (1995) Long term costs for foot ulcers in diabetic patients in multi-disciplinary setting. *Foot and Ankle International* **16**: 388–94

Boulton A, Armstrong D (2003) Trials in neuropathic diabetic foot ulceration. *Diabetes Care* **26**: 2689–90

Boulton A, Vinik A, Bil V et al (2005) Diabetic neuropathies: a statement by the American Diabetes Association. *Diabetes Care* **28**: 956–962

Bowling A (2002) *Questionnaire Design Research Methods in Health 2nd Edition*. Open University Press, Maidenhead

Collins K (1999) Developing patient satisfaction questionnaires. *Nursing Standard* **14**: 37

DoH (2001) *National Service Framework for Diabetes: Standards*. DoH, London

DoH (2002) *National Service Framework for Diabetes: A review for the Department of Health and the Medical Research Council*. Department of Health, London

DoH (2003) *National Service Framework for Diabetes: Delivery Strategy*. DoH, London

Edwards P, Roberts I, Clarke M et al (2003) *Methods to influence response to postal questionnaires (Cochrane Methodology Review)*. The Cochrane Library, Oxford

Gordois A, Schuffman P, Shearer A, Oglesby A (2003) The Healthcare Costs of Diabetic Peripheral Neuropathy in the UK. *Diabetic Foot* **6**: 62–73

IDF (2007) *Did You Know?* <http://www.idf.org/home/index.cfm?unode=3B96906B-C026-2FD3-87B73F80BC22682A> (accessed 19.02.2007)

Jankowicz A (2000) *Business Research Projects 3rd Edition*. Business Press; London

### Page points

1. The lack of a difference between podiatry knowledge improvement between groups who did and did not receive education was attributed to the small sample size of the study.
2. In anticipation of a larger study, the questionnaire could be improved by making instructions shorter and easier to understand.
3. Adequate study power is essential in order to prove hypotheses. Thus, recruitment of participants should be a primary focus of any subsequent studies.
4. Investigators should be prepared to increase their knowledge of research strategies and statistics in order to carry out their own trials.

Table 1. Summary of correct answers to questionnaire and improvement of scores.

	Facilitator-led education group n = 8		No education group n = 10	
	Questionnaire 1	Questionnaire 2	Questionnaire 1	Questionnaire 2
<b>Total correct answers</b>	59 (67%)	65 (74%)	70 (64%)	82 (75%)
<b>Improvement</b>		7%		11%



- LoBiondo-Wood G, Haber J (1998) *Methods, Critical Appraisal and Utilization Nursing Research*. Mosby, St Louis, Missouri
- Mullally S (2004) *Extending the Nursing Role. Themed Health Technology Assessment Update*. Available at: <http://www.ncchta.org/sundry/updates/htaupdatenursing.pdf> (accessed 06.01.07)
- National Institute for Health and Clinical Excellence (2004) *Type 2 diabetes - footcare. Type 2 diabetes: Prevention and management of foot problems*. Available at: <http://www.nice.org.uk/page.aspx?o=cg010> (accessed 06.02.07)
- Parahoo A (1997) *Nursing Research: Principles, Process and Issues*. Macmillan Press Ltd, London
- Ramsey S, Newton K, Blough D et al (1999) Incidence, outcomes and cost of foot ulcers in patients with diabetes. *Diabetes Care* **22**: 382–7
- Singh N, Armstrong D, Lipsky B (2005) Preventing foot ulcers in patients with diabetes. *Journal of the American Medical Association* **293**: 217–28
- Torgerson D, Torgerson C (2005) Personal communication
- van Houtum W, Lavery L, Harkless L (1995) The cost of diabetes related lower extremity amputations in the Netherlands. *Diabetic Medicine* **12**: 777–81
- WHO Europe and the IDF Europe (1989) *Diabetes Care and Research in Europe: The St Vincent Declaration 1989*. Available at: <http://www.idf.org/home/index.cfm?node=839> (accessed 19.02.2007)



If you are a member of a local or national group that has a special interest in the care of people with diabetes and wish to notify our readers of your activities then please email submissions to [editorial@sbcommunicationsgroup.com](mailto:editorial@sbcommunicationsgroup.com)  
T: 020 7627 1510  
F: 020 7627 1570  
(Please include your name, title, position in the group and full contact details)

## RCN PAEDIATRIC AND ADOLESCENT DIABETES SPECIAL INTEREST GROUP

Work continues for the 2007 RCN PADG conference and AGM. Provisionally, Liverpool has been chosen as the location and the dates set for 23–24 November.

At the RCN congress to be held on 16–18 April newly elected Chair of RCN PADG Rebecca Thompson and committee member Emma Day will be running a student seminar entitled 'Childhood Diabetes for the Terrified'. The aim of the session is to increase knowledge of the incidence, epidemiology and management of diabetes in childhood.

In other news, the report *Commissioning for Children and Young People with Diabetes* is in the closing stages of being produced. It will hopefully be launched in the near future. We would also like to highlight Diabetes UK's call for paediatric DSNs to share their examples of good practice with them, Stella Valerkou is the person to contact regarding this; she can be contacted at: [stella.valerkou@diabetes.org.uk](mailto:stella.valerkou@diabetes.org.uk).

The final point goes to the BBC coverage of the report undertaken by Diabetes UK. Their findings suggest four out of five children are not achieving

the recommended blood glucose control and hence the poorer health outcomes for these children need to be addressed. Resource implications have been identified as the major contributing factor to this issue. The RCN recognises this and also draws upon anecdotal evidence of falling numbers of paediatric DSNs, with others being asked to work on hospital wards. This, in conjunction with the lack of school nurses, further diminishes the services and expertise that can be offered to children and their families.

*Marie Marshall, Publicity Officer,  
RCN Paediatric and Adolescent Diabetes Group*