

A cost consequence study of the impact of a dermatology-trained practice nurse on the quality of life of primary care patients with eczema and psoriasis

DAVID KERNICK

ANNIE COX

ROY POWELL

DEBORAH REINHOLD

JUDITH SAWKINS

ANDREW WARIN

SUMMARY

Background. *The practice nurse is central to the development of a primary care-led National Health Service. Skin diseases can have a major impact on patients' lives but general practitioners (GPs) lack many of the skills of practical dermatology care and support.*

Aim. *To determine whether a primary care dermatology liaison nurse should be introduced by our health authority. We identified the resources consumed and the benefits that accrued from a practice nurse who had received training in practical dermatology care.*

Method. *A cost consequence study in parallel with a randomised controlled trial was undertaken in a group of nine GPs and 109 patients between the ages of 18 and 65 years who had a diagnosis of psoriasis or eczema.*

Results. *Although there was a significant improvement in our primary outcome measure within group, when compared with the control group significance was not achieved. There was no significant change in the Euroqol measure but the clinical instrument showed a significant change when compared with control. On entry, our qualitative data identified three main themes — the embarrassment caused by these skin conditions, the wish for a cure rather than treatment, and concern over the long-term effects of steroids. On completion, 20% of patients expressed that they had received a positive benefit from the clinic.*

Conclusion. *This study demonstrates the difficulties of obtaining relevant information to facilitate decisions on how resources should be allocated in primary care. Not all questions can be answered by large multi-centred trials and studies themselves have an opportunity cost consuming resources that could otherwise be spent on direct health care. Often, local resource decisions will be based on partial evidence-yielding solutions that are satisfactory rather*

than optimum but which are, nevertheless, better than decisions taken with no evidence at all.

Keywords: *dermatology; specialist nurse; cost consequence study.*

Introduction

THE practice nurse is central to the development of a primary care-led National Health Service (NHS) based on teamwork and an approach that seeks to match clinical presentation with an intervention based on an appropriate level of skill and training.¹ The role of specialist practice nurses has expanded ahead of evidence of effectiveness and cost-effectiveness.²

Skin disease can have a major impact on patients' lives.³ However, general practitioners (GPs) lack many of the skills of practical dermatology care and support; disability is often underestimated and many needs remain unmet.⁴ Dermatology nurses can manage skin problems effectively in hospital outpatients.⁵ We sought to identify and present in a disaggregated form the benefits that accrued from a nurse-led dermatology clinic and the resources that were consumed from a limited NHS perspective. Our study highlights some of the problems of obtaining relevant evidence to facilitate the allocation of resources between competing interventions.

Method

Setting

The study took place in St Thomas' Health Centre, a practice of 18 000 patients of whom 86% are designated as urban and 14% rural. We undertook a randomised controlled trial with delayed intervention as control. These were patients who agreed to take part in the study but who received routine GP care for a period of four months before seeing the nurse. The dermatology nurse was unaware of allocation but the allocator who managed the study was not blinded.

Entry and randomisation

Patients aged between 18 and 65 years who had a diagnosis of psoriasis or eczema were identified from the practice database. The inclusion criterion was defined as a minimum of three repeat prescriptions for a topical medication in the past year. There were no exclusion criteria. On accepting the invitation to enter the study, subjects were randomised using computer-generated random numbers.

Intervention

One of our practice nurses received a structured training programme from our local hospital dermatology department over a period of 87 hours. This included ward and outpatient attendance, direct tuition, and background reading encompassing the treatment, education, and psychological support of patients,

D Kernick, MD, MRCP, general practitioner; D Reinhold, research manager; and J Sawkins RCN, practice nurse, St Thomas' Health Centre, Cowick Street, Exeter. A Cox, RCN, dermatology nurse; and A Warin, FRCP, consultant dermatologist, Royal Devon and Exeter Hospital Trust, Exeter. R Powell, PhD, senior lecturer, Research and Development Support Unit, University of Exeter.

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carers, and their families. Patients were invited to attend a clinic where the nurse was able to offer as many consultations over a period of four months as she felt were indicated. She followed guidelines outlined in the dermatology manual supplied to primary care by the Department of Dermatology at the Royal Devon and Exeter Hospital. GPs signed prescriptions for her recommendations without seeing the patients. Control patients received routine GP care.

Outcomes

The primary outcome measure was the Dermatology Life Quality Index (DLQI).⁶ This instrument generates a score between zero (worst state) and 30 (best state). To detect changes in overall quality of life we used the visual analogue scale from the Euroqol instrument,⁷ which generates a score of zero (worst state) to 100 (best state). To obtain disease-specific clinical data, we asked patients to specify up to three aspects of their skin condition from a list of eight (scaling, redness, itchiness, pustules, swelling, dryness, extent of rash, thickness of rash) and score each of these elements from one (mild) to five (very severe). The sum of these scores gave a clinical score of three (best state) to 15 (worst state). Finally, we attempted to capture simple qualitative data by inviting all subjects to describe on their follow-up questionnaire their response to the care received at the clinic. Outcomes were measured by post at zero and four months. Non-responders were sent a second questionnaire and, finally, received a telephone reminder.

Resource utilisation

We took a limited economic perspective that included the cost implications of nurse and GP time only. For the purpose of a costing exercise we assumed that a nurse would run one clinic per week, at which nine patients would be seen on average twice, and that GP consultations for psoriasis and eczema were reduced by a similar amount to that which we observed in our study. We ignored costs incurred by patients. Our study was not of sufficient duration to identify prescribing implications, although our impression was that the use of topical steroids was reduced and simple emollients increased following the intervention. We took the unit costs of nurse and GP time from Netten.⁸

Analysis

Based on a previous hospital study,⁶ we estimated that for 80% power at a 5% level of significance we would need 32 patients in each group to detect a reduction of 50% in the DLQI score. Entry comparisons were made using Student's *t*-test and chi-squared tests. We compared the change in each variable within and between groups using a two-tailed Student's *t*-test. Data were analysed on an intention-to-treat basis but patients who did not attend for an initial clinic appointment were not included. We analysed our data using SPSS for Windows.

Results

On entry (quantitative)

The trial profile is shown in Figure 1. One hundred and ninety-nine patients satisfied the inclusion criteria, of whom 109 (55%) agreed to take part in the study. There were no differences in age and sex but there were significantly more patients with psoriasis who took part than those who did not (36 [33%] versus 16 [18%], $P < 0.004$). Entry characteristics of intervention and control groups are shown in Table 1. There were no differences in age, diagnosis, previous consultant referral or outcome measures.

Nine (16%) patients from the intervention group did not attend for an initial clinic appointment and were excluded from the trial.

Eleven (24%) patients in the intervention group and eight (15%) in the control group were lost to follow-up. (There were no differences in the DLQI between these groups.) These were patients who, despite the reminders detailed above, did not return their questionnaires or who had left the practice. The median number of clinic attendances was two (inter-quartile range = 2). During the study two patients saw their GP for eczema or psoriasis in the intervention group compared with 14 in the control group ($P < 0.005$).

On entry (qualitative)

We received 49 written comments (45% of questionnaires received) from both groups on entry. Of these, 35 (72%) described an effect on the patient's life and the remainder concerned matters of process. Three main themes emerged:

1. Nine patients commented on the embarrassment caused by their skin condition: 'It is very embarrassing people asking what is wrong with your skin even worse people asking what is that smell which is my treatment.' 'I can't take the children swimming as I always cover up my arms and legs.' 'I have to wear clothes that cover up my eczema.' 'I would like to go swimming or take off my shirt when the weather is good but I cannot as I am embarrassed.' 'I feel very embarrassed staying away from home leaving scaly skin everywhere.'
2. Six patients expressed the wish for a cure: 'I wish there was a magic lamp!' 'I hope a cure can be found in the future — I don't want this problem for the rest of my life.'
3. Four patients were worried about the long-term effects of steroids: 'Is it true steroids can harm my skin?' 'I am concerned about using Dermovate over a prolonged period of time.' 'I dream of finding a way of controlling my eczema which does not lead to long-term damage.'

At completion (quantitative)

Table 2 shows trial results. Although there was a significant improvement in the DLQI of 25% of patients ($P < 0.01$), this change was not significant when compared with the 9% improvement in the control group. There was a significant change in the clinical score when compared with the control group ($P < 0.05$) but no change in the Euroqol generic health measure.

At completion (qualitative)

We received 15 (43%) comments from the intervention group. One case had become worse: 'Currently I am going through a relationship break-up and this is making my asthma and skin condition worse.' Five cases were general commentaries of no relevance to the intervention. Nine (20%) cases expressed a positive benefit from the clinic. For example: 'I have found my problems concerned with dermatology too trivial to bother my GP with but it was eye-opening to discuss these issues with the nurse and satisfying to find help and advice relating to everyday problems.' 'I have always felt until now that I had no right to ask for help but this has been made OK. The advice I was given is invaluable to me and my family.' 'My visit to the dermatology nurse was well worthwhile. I think after all these years I have at last got the right medication.' 'My appointment was of value to me indicating my dry skin type and preventative measures.'

Table 3 shows the disaggregated resources used in training and running the clinic and a summary of our outcomes.

Conclusion

We related the disaggregated resources utilised in the training of a practice nurse and the operation of a dermatology clinic to the

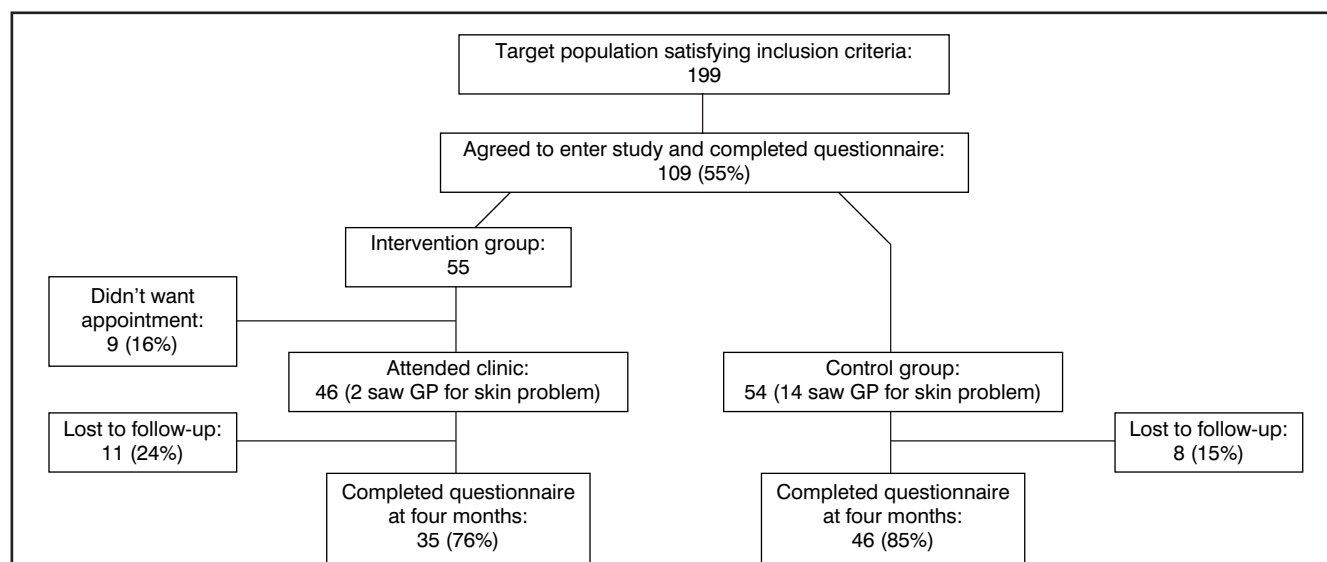


Figure 1. Trial profile.

Table 1. Characteristics of intervention and control groups at trial entry.

	Intervention (n = 46)	Control (n = 54)
Sex	Female: 28 (61%) Male: 18 (39%)	Female: 28 (52%) Male: 26 (48%)
Age in years ^a	47.4 (SD = ±18.4)	51.7 (SD = ±15.8)
Skin condition	Eczema: 26 (57%) Psoriasis: 16 (35%) Mixed: 4 (9%)	Eczema: 33 (61%) Psoriasis: 20 (37%) Mixed: 1 (2%)
Previous consultant referral for condition	22 (48%)	27 (50%)
DLQI (0–30) ^a	6.1 (SD = ±4.9)	6.8 (SD = ±5.0)
Clinical score (3–15) ^a	9.3 (SD = ±2.9)	8.4 (SD = ±3.1)
Euroqol generic quality of life (0–100) ^a	69.2 (SD = ±20.8)	62.5 (SD = ±23.1)

^aMean.**Table 2.** Characteristics of intervention and control groups at entry and at four months.

	Intervention		Control	
	Entry ^a	Completion ^b	Entry ^a	Completion ^b
DLQI ^c	6.1 (SD = ±4.9)	4.6 (SD = ±4.7)	6.8 (SD = ±5.0)	6.2 (SD = ±5.2)
Clinical score (0–15) ^c	9.3 (SD = ±2.9)	7.6 (SD = ±3.3) ^d	8.4 (SD = ±3.1)	8.1 (SD = ±3.3)
Euroqol generic quality of life (0–100) ^c	62.9 (SD = ±20.8)	68.4 (SD = ±20.8)	62.5 (SD = ±23.1)	65.1 (SD = ±23.8)

^at = 0; ^bt = four months; ^cmean; ^dbetween changes in control and intervention groups P < 0.05.

benefits gained in order to provide evidence for our local health authority in support of the employment of a dermatology liaison nurse.

When health budgets are limited, the way in which the benefits of an intervention relate to the resources used can facilitate decisions on resource allocation. However, such studies in primary care are often difficult. Outcomes may be multi-dimensional; there may be difficulties in attributing outcomes to their inputs; outcomes cannot be integrated into one overall measure of benefit; assessment may be affected by timing. A cost consequence analysis⁹ attempts to overcome some of these problems by pre-

senting information on both costs and outcomes in a disaggregated form, assuming that the decision-makers can make any necessary value judgements and trade-offs that are relevant from their particular perspective.

The perspective of an exercise defines which costs to count. Health economists advocate a societal perspective that includes all costs irrespective of who bears them. Owing to resource constraints and the short time horizon of our study, we took a limited viewpoint and considered the implications for nurse and doctor time only. A broader NHS perspective would include more long-term implications for drug expense and hospital referral.

Table 3. Disaggregated outcomes and resource utilisation of training and intervention.

Resource utilisation		Outcomes
Item	Cost (£)	
Practice nurse training (87 hours)	1392	No change in dermatology-related quality of life instrument
Training implications for hospital dermatology nurse (24 hours)	384	Improvement in clinical symptom score
Annual cost of dermatology clinic (138 hours per year)	2208	No change in generic quality of life instrument
Annual potential savings in GP consultations (36 appointments)	504	Qualitative data infers benefit in 20% of patients

What did our outcomes indicate?

Although there was a significant improvement in our primary measure within our group, when compared with the control group significance was not achieved. We had powered our study on the basis of a 50% reduction by the intervention of the nurse on the DLQI. A subsequent uncontrolled prospective study showed that the DLQI improved by 32% following the intervention of a consultant dermatologist,¹⁰ so our study was underpowered to detect a reduction we could have anticipated. In fact, our nurse caused a 25% reduction in DLQI compared with 32% by the consultant dermatologist in the uncontrolled study.

We found a significant improvement in a patient-generated clinical measure. Although this instrument has not been formally validated it does reflect a reduction in dermatology-related burden on patients. We could not identify an impact on a broader quality of life instrument using the Euroqol linear analogue scale.

The problems of randomised controlled trials are well recognised¹¹ and it has been argued that such trials give information on treatment effects in groups of patients but are generally uninformative at the level of the individual. Black¹² has argued that these difficulties may be overcome by the relevant application of observational data. To this end, we obtained simple qualitative information by inviting patients to comment in writing on their condition and the impact of the clinic. A simple content analysis revealed a number of patients whose life was affected by their skin condition, whose care was less than optimal, and who received considerable benefit from the dermatology nurse.

Statistical power, generalisability of results, and research resource allocation

Not every question in medicine can be answered by a randomised controlled trial and an economic evaluation. Studies themselves have an opportunity cost and consume resources that could otherwise be directly allocated to healthcare. Our results also reflect the impact of one nurse on a specific population and may not be generalisable to other settings. Nevertheless, study costs increase exponentially with multi-centred trials and in many cases there will have to be a pragmatic compromise between study rigour, generalisability, and available research resources.

This paper highlights some problems of obtaining relevant evidence to facilitate resource allocation in the complex environment of primary care. When undertaking innovative changes in skill mix, care must be taken not to assume that new interventions are beneficial. We have suggested an approach using disaggregated quantitative data combined with qualitative information to facilitate the judgement of decision-makers. However, this approach assumes that the decision-maker is able to undertake

the trade-offs necessary to integrate the disparate outcomes of competing alternatives and relate them to their respective costs.

Edwards¹³ has argued that imprecise results are better than no results and small trials are better than no trials. We have derived evidence to facilitate the allocation of primary care resources, which, although they may be lacking in scientific rigour, may result in a 'better' decision.

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Address for correspondence

David Kernick, St Thomas' Health Centre, Cowick Street, Exeter EX4 1HJ. E-mail: sul838@eclipse.co.uk