The Outcome of an Education Programme to Assist Pharmacists in Prescribing Over-the-counter (OTC) Products for Common Skin Diseases

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Aim. Dermatology within the Pharmacy: an Education Programme on Common Skin Conditions for Pharmacists was developed to assist pharmacists in Australia with both the diagnosis of common skin diseases and the prescribing of appropriate nonprescription medications for their treatment. The educational resources comprised a 107-page book with colour photographs and diagnostic flow charts and a video that complemented the book. The programme was evaluated to determine its effectiveness in improving pharmacists' skills and confidence in diagnosis and management, and participants' satisfaction with the resource.

Method. Two hundred and ten community pharmacists, recruited by telephone from a list of community pharmacies, participated in the evaluation. Pharmacists were randomly allocated into three groups. Group 1 received printed educational material; group 2 received printed material and a supporting video; group 3 served as the control.

A mail questionnaire to assess pharmacists' confidence and skills in diagnosing and managing common skin conditions was distributed prior to distribution of the educational materials, and at one-month and six-months after distribution.

Results. One hundred and eighty-three pharmacists completed all three evaluations. Analysis at four weeks showed that groups 1 and 2 improved significantly in their skill in diagnosis whilst group 3 were relatively unaffected. Group 2 also increased significantly in their confidence in both diagnosing and managing skin conditions. Improvements were maintained six-months after the education programme.

One hundred and eleven pharmacists (60.7%) completed evaluations of their satisfaction with the programme. They rated both the book and the video very highly in helping to improve their ability to diagnose and manage skin conditions.

Conclusion. These data suggest that practical educational programmes such as the DEP are worthwhile in ensuring that consumers with common skin diseases receive appropriate advice in the community pharmacy setting.

Keywords: Community pharmacists; Dermatology; Programme evaluation; Over-the-counter products

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INTRODUCTION

In 1980, Darby *et al.* found that, of the total number of people reporting one or more recent illness conditions, only 23% sought consultation with a doctor, 41% ignored the symptoms completely, 17% used simple home remedies, whilst 23% used non-prescription or over-the-counter (OTC) medicines (Darby *et al.*, 1981). The 1990 Australian National Health Survey estimated that around 12.7% of the population had a skin problem and around one-fifth of these had used OTC skin preparations in the previous two weeks (Australian Bureau of Statistics, 1990). Skin complaints were the most frequently reported ailment in a survey by the Proprietary Association of Great Britain (1987).

A 1988 survey of pharmacy customers in Melbourne, Sydney and Brisbane reported that 10.3% of OTC sales were for skin products and that 22% of these sales involved discussion of symptoms with pharmacy staff (Benrimoj *et al.*, 1988). This corroborated the earlier findings of Hardisty (1982) in England, where it was found that 15% of sales resulted from pharmacists' advice.

A 1995 survey conducted in the community of Maryborough, Central Victoria showed that over 70% of products purchased by consumers for skin problems were OTC products. Of these, 39% were recommended by pharmacy staff whilst only 19% were recommended by medical practitioners. Over one-third of consumers buying OTC products sought advice on their skin conditions from pharmacy staff (Yeatman *et al.*, 1996; Kilkenny *et al.*, 1997). Blenkinsopp and Bradley (1996) examined the use of OTC products for health services in Britain and elsewhere, and found that sales of OTC products were equivalent to one-third of the NHS drugs expenditure. They reported a trend towards increased self-medication in the community.

With increasingly effective dermatological products and increasing numbers of prescription medicines being made available OTC for the treatment of skin conditions (Morgan and Cohen, 1995; Bond and Bradley, 1996; Bradley and Blenkinsopp, 1996; Thomas and Noyce, 1996), there is potential for reducing overall health care costs in dermatology by appropriate and effective use of OTC products (Hammerastrom *et al.*, 1995; Morgan and Cohen, 1995; Marsh, 1997). However, although their pharmacological knowledge is well-acknowledged, pharmacists' ability to diagnose common skin conditions and to identify symptoms that require referral to a doctor for more thorough examination and treatment have been found consistently to require improvement (Goodburn *et al.*, 1991; Consumers' Association, 1986; Mobey *et al.*, 1986).

Community pharmacists readily recognise their role as primary healthcare givers, and accept the need to extend beyond supplying and dispensing medicines to diagnosing and managing minor self-limiting conditions, evaluating the efficacy of pharmaceutical products in relieving a given patient's symptoms (Drawlins, 1991), and educating the public on disease management and prevention (Souvignier *et al.*, 1996; Erwin *et al.*, 1997). There is, therefore, clearly a need to further educate the pharmacists in dermatology to ensure that the quality of care within the pharmacy setting is up-to-date and appropriate to the needs of the community.

This study aimed to assess the ability of a purpose-designed pharmacy education programme about common skin diseases to improve pharmacists' diagnostic and management skills. It also aimed to assess the participants' satisfaction with the education programme.

MATERIALS AND METHODS

Development and Production of Educational Resources

The educational resources developed by Marks and Stewart comprised a 107-page book with

colour photographs and diagnostic flow charts, entitled *Dermatology within the Pharmacy: An Education Programme on Common Skin Conditions for Pharmacists*, and a video that complemented the book. The video concentrated on how patients in the pharmacy divulge symptoms and signs, and how pharmacists reach a clinical diagnosis. It did not cover treatment of skin conditions, but referred back to the book when treatment was required.

Information in the book included the diagnosis and management of common skin conditions, the use of products available OTC in Australia, guidelines on when to refer a person to a medical practitioner and what the medical practitioner would be likely to do in that circumstance.

Special features included:

1. a condition-specific section;
2. a presentation-specific approach that enabled pharmacists to arrive at a diagnosis based on history, symptoms and signs presented by consumers;
3. flow charts that prompted pharmacists to ask specific questions and look for signs to derive an appropriate diagnosis; and
4. a colour-coded navigational system incorporated into the video to aid quick and easy access to visual information.

Skin conditions discussed included eczema/dermatitis, seborrhoeic dermatitis, psoriasis, acne, superficial bacterial skin infections, warts, herpes simplex infections, tinea, pityriasis versicolor, candidiasis, papular urticaria, and skin cancer.

Development and Production of Evaluation Questionnaire

A questionnaire was designed to assess pharmacists' confidence, knowledge and skills in diagnosing and managing common skin conditions before and after the education programme. The questionnaire was piloted before use and the final version was distributed and returned by mail.

The questionnaire consisted of four sections:

Section A: Demographic details of the pharmacist.

Section B: Pharmacist's self-judged confidence in diagnosis, management, and referral for 18 selected common skin conditions.

Section C: Pharmacist's knowledge of and skills in diagnosis and management of common skin conditions. (Five case studies, each containing a clinical photograph, different from those in the book and video, and a short history. Each case study was accompanied by two multiple-choice questions, one on diagnosis of the skin condition and one on its management i.e. Section C comprised 10 questions in total.)

Section D: Pharmacist's knowledge of appropriate OTC treatments for 18 selected common skin conditions. (Pharmacists were asked to nominate their OTC treatment of choice for each of 18 listed skin conditions.)

Recruitment of Community Pharmacists

A sample size of 180 was calculated (Epi-Info, Version 5) to be required to detect at least 15% (95% CI 10–20) difference between the results of pre-intervention and post-intervention questionnaires with a power of 0.8. Allowing for dropouts and non-evaluable data, 210 pharmacists (one per pharmacy) were recruited by telephone from pharmacies selected from the current list of all the (1298) approved community pharmacies in Victoria. Selection was established by systematically selecting every sixth pharmacy on the list, starting at a random point in the list. Refusals were replaced by the next pharmacy on the list.

As an incentive to complete the education programme and take part in the evaluation process, pharmacists were offered 15 Continuing Pharmacy Education (CPE) contact credits by the Pharmaceutical Society of Australia (Victorian

Branch). They were also given the printed resource free of charge at the end of the study.

Stage 1: Pre-intervention

Pharmacists were asked to complete all four sections of the evaluation questionnaire before the education programme to determine baseline confidence and knowledge of and skills in diagnosis and management of common skin diseases.

Stage 2: Intervention

Pharmacists were randomly allocated to three groups ($n = 70$ in each group). Group 1 received the printed resource; group 2 received the printed resource and the video; group 3 was the control group who did not receive any educational resources until after the completion of the six-month evaluation process. Pharmacists in groups 1 and 2 were given four weeks to study and use the resources allocated before the questionnaire materials for the next stage were sent.

Stage 3: One-month Post-intervention

After the four weeks, all pharmacists in groups 1, 2 and 3 were asked to complete the same questionnaire to determine any change in their knowledge and skills with the common skin diseases.

Stage 4: Six-month Post-intervention

Six-months after the education programme, pharmacists were again asked to complete the questionnaire to assess change in confidence level as well as whether changes in their knowledge and skills with common skin diseases had been maintained. At this time, they also completed a questionnaire designed to assess their perceptions of how the education programme helped them deal with minor skin conditions.

The same questionnaire was used at each stage of the evaluation to allow direct comparison of results. Potential learning effects of reusing the same questionnaire were negated by use of a control group and by not providing participants with the expected answers during the study.

Data Analysis and Report

An expert panel consisting of a clinical dermatologist and two pharmacists (one an academic pharmacist with community pharmacy experience and the other with hospital clinical experience) assessed all pharmacists' questionnaires.

Data were analysed using SPSS (1997) and Minitab (1998). One-way ANOVA was used to test among groups for differences in confidence in diagnosis and management. The Mann–Whitney U test for independent samples was used to test between groups for differences in both the diagnostic and management skills as measured by the questionnaire pre- and post-intervention. The Kruskal–Wallis test was used to examine differences in the overall performance of the pharmacists in the three groups.

RESULTS

One hundred and ninety-two pharmacists (91.4%) completed the pre-intervention questionnaire, 189 (90%) completed one-month post-intervention questionnaire, and 183 (87.1%) completed the six-month post-intervention questionnaire. Data collected from the 183 pharmacists (57 group 1; 60 group 2; 66 group 3) who completed all stages were analysed and evaluated.

Demographics

The sample comprised 122 male (66.7%) and 61 female (33.3%) pharmacists aged from 22 to 65

years (mean 42.2, SD 12.1). Most pharmacists (53.7%) reported being asked by consumers for advice on skin conditions one or more times a day. The question posed to the pharmacists was "In the past month, how frequently have you been approached for advice about skin conditions?"; 8.9% reported being asked less than once a week.

Confidence in Diagnosis and Management

Pharmacists rated their confidence in diagnosing and managing the eighteen selected common skin diseases on a scale of 1–5 (1: "not confident" and 5: "very confident") prior to and six-months after the educational intervention. One-way ANOVA for the means of these two variables (Table I) indicated no difference among the groups at baseline (all scoring between 3.5 and 3.8), but significant differences in confidence in diagnosis ($p = 0.023$) and management ($p = 0.020$) six-months after the intervention. Pharmacists from group 2 increased in confidence significantly more than pharmacists from either of the other two groups.

Clinical Knowledge and Skills

Diagnosis

Each pharmacist was used as their own control and given a score of "1" if they improved after the programme, "−1" if they did worse, or "0" if not affected. The Mann–Whitney U test for independent samples on the diagnostic performance of the pharmacists (Table II) showed groups 1 and 2 performed significantly better than group 3 both at one-month and at six-months following the intervention. Although group 2 performed better than group 1, only at the six-month post-intervention were the results significantly different. At six-months, groups 1 and 2 continued to perform significantly better than group 3. The difference between six-month post-intervention and one-month post-intervention results of each of the three groups was not statistically significant.

Management

There was no significant change in management ability amongst the three groups at one-month or six-months after the DEP programme.

Overall Improvement

The Kruskal–Wallis test on the overall performance of the pharmacists in the three groups (Table III) showed that a highly significant difference between pre-intervention and one-month post-intervention was evident in the results of the three groups (u test $p < 0.001$, Kruskal–Wallis $p = 0.001$). Performance of both groups 1 and 2 significantly improved one-month following intervention whilst group 3 pharmacists' scores were relatively unaffected. In fact, they performed a little worse than before (u test $p = 0.008$, Kruskal–Wallis $p = 0.006$).

TABLE I   Pharmacists' mean confidence in diagnosing and managing common skin diseases before and six-months after intervention

Groups	Mean confidence in diagnosis		Mean confidence in management	
	Pre-	6 Months post-	Pre-	6 Months post-
1	3.53±0.53	3.88±0.42	3.59±0.66	3.82±0.55
2	3.60±0.48	4.04±0.40	3.72±0.55	4.06±0.52
3	3.64±0.47	3.84±0.41	3.58±0.62	3.81±0.59
	($p = 0.467$)	($p = 0.023$)	($p = 0.364$)	($p = 0.020$)

TABLE II Average number of correct diagnosis responses by pharmacists for the five case studies (significant results in italics)

Group	Pre-intervention (S1)	1 Month post-intervention (S3)	Difference (S3−S1)	6 Months post-intervention (S4)	Difference (S4−S3)
1	1.37	2.22	*0.85*	2.29	0.07
2	1.55	2.63	*1.08*	2.75	0.12
	$p = 0.357$	$p = 0.065$	$p = 0.168$	$p = 0.016$	$p = 0.805$
1	1.37	*2.22*	*0.85*	*2.29*	0.07
3	1.69	*1.78*	*0.09*	*1.76*	−0.02
	$p = 0.105$	$p = 0.036$	$p = 0.001$	$p = 0.037$	$p = 0.960$
2	1.55	*2.63*	*1.08*	*2.75*	0.12
3	1.69	*1.78*	*0.09*	*1.76*	−0.02
	$p = 0.462$	$p<0.001$	$p<0.001$	$p<0.001$	$p = 0.723$

There was no significant difference between groups 1 and 2.

Whilst age had a small effect on performance (an increase of 0.026 per year, $p = 0.032$), factors such as gender ($p = 0.832$), years of registration ($p = 0.089$) and average number of hours worked per week ($p = 0.610$) showed no significant effect on the total increase in correct scores. After six-months, groups 1 and 2 continued to perform significantly better than group 3 (u test $p = 0.002$, Kruskal–Wallis $p = 0.002$). The differences in response levels between six-month post-intervention and one-month post-intervention for each of the three groups was not statistically significant (u test $p = 0.659$, Kruskal–Wallis $p = 0.887$).

Pharmacist Satisfaction Survey

At the completion of the programme, pharmacists were asked to rate how they perceived the education programme to have helped them in dealing with common skin conditions. One hundred and eleven pharmacists (60.7%) returned the completed evaluation forms. Pharmacists rated both the book and the video very highly in helping to improve their ability to diagnose and manage skin conditions (Table IV). Almost half of the pharmacists who responded stated that they continued to use the book once a week in their practices, and another almost 40% of pharmacists stated that they used it once a month.

DISCUSSION

The demographic distribution of the 183 community pharmacists involved was generally in line with the latest available National Pharmacy Labour Force (NPLF) statistics (Australian Institute of Health and Welfare, 1994). One exception was the ratio of male to female pharmacists. In the 1994 NPLF data the ratio was 3:2, whilst in our sample it was 2:1. This

TABLE III Average number of correct responses by the pharmacists for the five case studies (significant results in italics)

Group	Pre-intervention (S1)	1 Month post-intervention (S3)	Difference (S3−S1)	6 Months post-intervention (S4)	Difference (S4−S3)
1	4.2	*5.2*	*1.0*	5.2	0.1
2	4.7	*5.7*	*1.1*	5.9	0.1
3	4.9	*4.8*	*−0.2*	4.6	−0.1
	K–W $p = 0.358$	K–W $p = 0.006$	K–W $p = 0.001$	K–W $p = 0.002$	K–W $p = 0.887$

TABLE IV Pharmacists' evaluation of the effectiveness of the DEP programme

Survey question	Average response
How would you rate (from 1 to 7) the book in helping you to diagnose skin conditions? (1 = no value, 7 = great value)	5.84±1.07
How would you rate (from 1 to 7) the book in helping you to manage skin conditions? (1 = no value, 7 = great value)	5.57±1.05
Since receiving the book, I have used it in my practice: never, once a month, once a week, once a day, more than once a day	Never 7.2%, once a month 37.8%, once a week 45.9%, once a day 9.0%, more than once a day 0.0%
How would you rate (from 1 to 7) the video in helping you to diagnose skin conditions? (1 = no value, 7 = great value)	5.39±1.30 (note 44 pharmacists did not receive the video)
How would you rate (from 1 to 7) the video in helping you to manage skin conditions? (1 = no value, 7 = great value)	4.90±1.30 (note 44 pharmacists did not receive the video)

could be explained by the fact that the randomised selection process used pharmacies as the sampling frame, resulting in 60% of the pharmacists recruited for the programme being either sole or partner proprietors. Most proprietors tend to be males (Australian Institute of Health and Welfare, 1994).

The education programme more notably improved the pharmacists' diagnostic ability than their disease management skills. Improvement in management was more difficult to detect, since pharmacists were already nominating correct management options 60% of the time even at the pre-intervention phase.

This study was able to demonstrate that the improvement in clinical skills was maintained in both groups 1 and 2 (see Tables II and III) at six-month post-intervention. This is important as it demonstrates the long-term benefits of the DEP and suggests that the use of an educational and practical tool would be applicable for other continuing education and professional training.

We were unable to demonstrate with this sample that the addition of the video to the education programme led to significant improvement in diagnosis over and above that achieved with the printed resource. Although group 2 performed 8% better than group 1, statistical significance was not seen because the sample size was calculated to detect at least a 15% difference between the groups. It would be interesting to

observe if this trend could be confirmed with a larger sample size.

Another possible explanation, if the trend was not real, could be that the pharmacists in our sample were trained to use books rather than electronic media, like videos, as a source of learning and information. Also, the design of our study allowed pharmacists to retain only their books for the duration of the programme as the videos were returned at one-month. Therefore, they could not have consulted the video in the latter part of the six-month period.

No intervention occurred between the pre-intervention and post-intervention stages for the pharmacists in the control group, group 3, and their performance deteriorated between the base-line and the subsequent performance evaluations.

Although pharmacists rated the video very highly in helping to improve their ability to diagnose and manage skin conditions, they did not think that the video was better than the book in improving their diagnostic skills. It is interesting to note that pharmacists rated the video relatively highly (5 on a scale of 1–7) in helping them with managing skin conditions, although it concentrated only on diagnostic approaches and did not contain any details on management of skin diseases. Perhaps when pharmacists felt more confident in diagnosing a skin condition correctly, they may also have felt they were able to treat it more appropriately.

CONCLUSIONS

Use of the book entitled *Dermatology within the Pharmacy: An Education Programme on Common Skin Conditions for Pharmacists* was shown to be effective in improving pharmacists' clinical diagnostic ability. The addition of the video increased pharmacists' confidence in their ability to diagnose and manage, and may have enhanced diagnostic ability. Increase in knowledge and skills were maintained six-months after the education programme. This further confirms the value of the educational and practical programme, both in the short- and long-term. The education programme *Dermatology within the Pharmacy: An Education Programme on Common Skin Conditions for Pharmacists* is a valuable reference to have in the community pharmacy setting. The results of this study suggest that resources that are designed not only to be educational but also to be useable in the practice setting may provide sustained advantages.

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