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Peer advisers compared with specialist health professionals in delivering a training programme on self-management to people with diabetes: a randomized controlled trial

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Abstract

**Aims** To assess the effectiveness and acceptability of peer advisers in diabetes in delivering a programme of training on self-management for people with diabetes.

**Methods** Adults with diabetes were randomly allocated to an education programme delivered either by trained peer advisers or by specialist health professionals. The primary outcome measure was change in knowledge tested before and at the conclusion of the four courses, each consisting of six sessions. Glycated haemoglobin and Diabetes Care Profile were assessed at baseline and at 6 months. Sessional and end-of-course evaluation responses were analysed, as was the attendance record.

**Results** Eighty-three patients were randomized. Of these, 14 failed to attend and two were excluded. Knowledge scores improved significantly in both groups, but there was no difference between the groups for any of the knowledge domains. No difference was noted in the Diabetes Care Profiles or in glycated haemoglobin. The attendance record was similar in both groups. In the post-sessional evaluations, both groups scored highly, with the health professionals significantly more so. The post-course questionnaire exploring patients' understanding and confidence in self-management of specific aspects of diabetes care revealed no difference between the groups.

**Conclusions** Trained patients are as effective in imparting knowledge to their peers as specialist health professionals. Both are also acceptable to patients as trainers. However, lay tutors require to be given appropriate training, specific to the education programme they would be expected to deliver.

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**Keywords** diabetes, education, peer advisers, self-management

**Abbreviations** CDSMP, Chronic Disease Self-Management Program; EPP, Expert Patient Programme; HbA₁c, glycated haemoglobin; PADs, peer advisers in diabetes; SHPs, specialist health professionals
Numerous studies of the CDSMP have been reported from many Governments encourage the development of lay-led tutors [5]. The formal establishment of the Expert Patient Programme (EPP) by the Department of Health confirms that the UK Department of Health confirms that the UK Disease Self-Management Program (CDSMP) [4]. The construction of the programme of training on self-management was undertaken initially with a whole day seminar of SHPs and people with diabetes and their carers. A further meeting was held with the island patient group to discuss the curriculum. This ensured that the requirements were person centred rather than being dictated by SHPs and that it was based on the needs of people with diabetes. The outcome was an educational programme with the aim of helping patients to improve their self-management. The curriculum was considered to be suitable for both diabetes Types 1 and 2. Each course would consist of six sessions held at weekly intervals. In the sixth and final session of each course, participants were to be separated according to whether they were taking insulin or were primarily on diet and/or oral agents. A lesson plan was developed for each session. This described the purpose, content and educational objectives of each session. Together with the handouts, they also served as the instructors’ manual.

The style of the teaching sessions delivered by the PADs and SHPs was the same. Sessions were interactive throughout. The format encompassed general principles and facts, along with problem-solving and questions and answers. Participants were encouraged to raise issues from their own experience. Each session closed only after participants had been given the opportunity to ask questions.

At each session facilitated by PADs, a SHP was present and intervened in the event of inaccuracies. At the end of each session, participants completed an anonymized evaluation sheet; responses were on a scale of 1 to 10. They also completed an end-of-course assessment form to evaluate their confidence in specific areas of diabetes. The responses were on a scale of 1 to 5. The latter form included additional questions for patients in the PADs group to ascertain if they would have preferred to have been taught by SHP and if they felt confident with the responses given by the PADs.

Outcome measures

The primary outcome was a change in knowledge tested before and at the conclusion of each course assessed using American Association of Clinical Endocrinologists (AACE) Knowledge Evaluation Forms [19]. This test assessed patients’ understanding of five domains—what is diabetes (18 questions), nutrition (24 questions), exercise (7 questions), monitoring (10 questions) and medications (9 questions). An attendance record was maintained. Sessional and end-of-course evaluation scores were also compared.

Original article

Patients and methods

The aims of this study were to assess the effectiveness and acceptability of PADs in delivering a programme of training on self-management for people with diabetes compared with the same programme delivered by the SHPs. This was a randomized controlled trial, carried out at the Isle of Wight NHS Primary Care Trust.

A random sample of adults with diabetes aged 18 to 75 years registered at the secondary care Diabetes Centre was invited to participate in the study. Patients who agreed to participate were then randomly assigned to either the group to be taught by PADs or by the SHPs using the online QuickCalcs calculator [18]. As patients could identify instructors, blinding was not possible. Those patients who were unable to participate in a group setting (e.g. with impaired vision or hearing) and those who had already received extensive coaching (e.g. patients on insulin pump or PADs) were excluded.

Educational sessions in groups of 10 to 15 were held in the evenings, each lasting for 90 min. Four courses were conducted during the study.

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Secondary outcome measures were changes in glycated haemoglobin and the Diabetes Care Profile [20–22]; these were assessed at baseline and after 6 months.

Training of PADs
PADs are people with diabetes who had voluntarily undertaken an extensive programme of training described elsewhere [16]. PADs had to complete the training and were then formally assessed by a written test followed by a 40-min oral examination conducted by independent examiners [16]. Nine PADs volunteered for further training in order to participate as lay educators in the current study. Further training of these individuals was undertaken by the SHPs, all of whom had prior training on teaching methods. The SHPs delivering the training were three specialist diabetes nurses (DH, EW and PW) and a consultant diabetologist (AKB). The nine PADs were divided into two groups, with each group being trained by pairs of SHPs. Each training session therefore had two parallel working teams. Some PADs required more training than others.

A lesson plan was developed for each session. This described the purpose and content of the sessions. It also served as the instructors’ manual. Each session in the agreed curriculum was first delivered by a SHP and this was followed by rehearsals by the PADs. Each training session ended with all participants critiquing the performance of the presenter, with suggestions on how to improve the delivery. The presentations, handouts and lesson plans underwent several revisions during this training period. When all PADs had been assessed and felt confident with their ability to present, they underwent a dress rehearsal of an entire course before a group of invited patients. This training extended over 33 sessions.

Statistical analysis
Calculation of the sample size required for the comparison between treatment groups was based on the only identified randomized trial of professional-led vs. lay-led education intervention in the arthritis self-management programme (ASMP) [14]. The study provided differential knowledge outcomes for lay-led and professional-led groups of arthritis patients on the scale from 0 to 10. Using 80% power and significance level α = 0.05, the minimum required sample size was determined as n = 31 for each arm (Stata 9.1; StataCorp., College Station, TX, USA). Allowance for attrition rate of 30% was made. The numbers randomized were nPAD = 40 and nSHP = 43, with 15% (randomized to PAD) and 18% (randomized to SHP) of the patients not initiating training. All patients who started the training completed the study, 34 and 33, respectively, which was more than the minimum required sample size. To also power the study for improvement in knowledge relative to baseline value regardless of the intervention, three studies identified in a recent Cochrane review of training interventions for groups of diabetic patients [23] were used. Based on these studies, using validated questionnaires and reporting knowledge scores at baseline and after 4–6 months, the minimum required sample size varied between 5 and 16 for each arm. Therefore, our study was deemed sufficiently powered for detecting within-group improvements and for comparison between interventions.

Demographic and biometric data and knowledge scores at baseline were not normally distributed and the non-parametric Mann–Whitney U-test was used to compare the two groups. For differences in baseline proportions, Student’s t-test for independent samples was applied. Additionally, significance was tested for with confidence intervals around median differences using script for permutation tests (SAS 9.0; SAS Institute, Cary, NC, USA). Based on exclusion of zero, the median differences were considered significant. Non-parametric tests were used for within-group (before–after) comparisons (Wilcoxon Signed Rank test) and for between-group comparison of before–after differences (Mann–Whitney U-test). Multiple linear regression was used to adjust knowledge outcomes for baseline patient characteristics; diagnostics of residuals was conducted to verify assumptions. Both forward and backward selection methods were used for robustness, with the backward selection results reported.

Results
Of the 83 patients randomized, 40 were assigned to the PADs group and 43 to the SHPs group. Six patients in the former group and eight in the latter group failed to attend. Two patients, both in the SHP group, were excluded, one being blind and the other being on an insulin pump. Thus, 67 patients (34 in the PADs group and 33 in the SHPs group) completed the study.

There were no significant differences in baseline characteristics between patients who initiated the programme and those who failed to attend or were excluded (P ≥ 0.095). Baseline demographic characteristics, type and duration of diabetes as well as the treatment regimen did not differ between the two groups; patients in the PADs group had higher body mass index (BMI) and diastolic blood pressure with a trend for higher systolic blood pressure (Table 1). In the PADs group, seven patients had retinopathy and one had neuropathy. In the SHPs group, six patients had retinopathy and three had neuropathy, rendering the difference in complication rates non-significant (P = 0.784). Neither was significant difference found in diabetes treatment modalities (diet, oral agents or insulin therapy) between the two groups PADs and SHPs (P = 0.46). Baseline knowledge of diabetes was identical in the two groups (Table 2). Course attendance was 93% in the PADs group and 95% in the SHPs group (P = 0.065). In the former group, 20 patients attended all six sessions, 13 attended five sessions and four patients attended four sessions, while in the latter group, 27 patients attended all six sessions, five attended four sessions, one attended four sessions and one attended three sessions.

Knowledge results
Knowledge scores improved in all five domains in the PADs group. In the SHPs group there was improvement in three out of five domains; namely, nutrition, exercise and medicine (Table 2). Multiple linear regression showed that knowledge
improvement was not significantly different in the two groups.

No significant difference was found between the PAD and SHP groups in the change of glycated haemoglobin (HbA1c) as a result of the interventions. The difference in HbA1c change was 0.17 percentage points (P = 0.609). The before–after changes for each group were also non-significant with values of 0.19 (P = 0.429) for PADs and 0.02 (P = 0.915) for SHPs. Results of the Diabetes Care Profile showed no between-group difference for any of the items (Table 3).

Table 1 Baseline characteristics of patients in the two groups

| Characteristic                        | PADs       | SHPs       | P-value |
|--------------------------------------|------------|------------|---------|
| Age (years)                          | 60.5 ± 11  | 59.3 ± 13  | 0.865   |
| % women                              | 52.9       | 42.4       | 0.397   |
| BMI (kg/m²)                          | 32.5 ± 5.3 | 28.7 ± 5.5 | 0.004   |
| Systolic BP (mmHg)                   | 141 ± 18   | 132 ± 17   | 0.068   |
| Diastolic BP (mmHg)                  | 79 ± 12    | 74 ± 10    | 0.043   |
| HbA1c (%)                            | 7.6 ± 1.6  | 7.4 ± 1.3  | 0.719   |

Mean ± SD or *median (25–75th centile).
BMI, body mass index; BP, blood pressure; HbA1c, glycated haemoglobin; n/N, actual number/total number; PADs, peer advisers in diabetes group; SD, standard deviation; SHPs, specialist health professionals group.

Table 2 Knowledge scores

| Knowledge domain         | PADs Before | Mean change | Median change | P-value (change) | SHPs Before | Mean change | Median change | P-value (change) | Group difference |
|--------------------------|-------------|-------------|---------------|------------------|-------------|-------------|---------------|------------------|------------------|
| What is diabetes         | 82.6        | 89.0        | 6.4 (12.1)    | 6.0              | 0.003       | 81.2        | 85.7          | 4.5 (16.5)       | 0.0              | 0.130       | 0.391 | 0.999 |
| Nutrition                | 70.7        | 76.3        | 5.8 (10.5)    | 4.0              | 0.001       | 73.4        | 78.3          | 4.9 (12.8)       | 0.0              | 0.017       | 0.644 | 0.814 |
| Exercise                 | 74.4        | 82.2        | 13.8 (20.7)   | 14.0             | 0.001       | 76.2        | 86.6          | 10.4 (18.2)      | 14.0             | 0.003       | 0.998   | 0.924 |
| Monitoring               | 60.7        | 75.2        | 14.5 (17.8)   | 10.0             | <0.001      | 67.6        | 73.1          | 5.5 (18.7)       | 0.0              | 0.148       | 0.045   | 0.117 |
| Medicines                | 58.0        | 66.6        | 8.6 (22.9)    | 11.0             | 0.011       | 57.8        | 65.3          | 7.5 (15.5)       | 0.0              | 0.016       | 0.273   | 0.469 |
| Total                    | 71.2        | 78.9        | 7.7 (8.7)     | 9.0              | <0.001      | 72.9        | 78.7          | 5.8 (11.1)       | 6.0              | 0.002       | 0.777   | 0.797 |

Units are expressed as per cent.
Adjusted P-value: significance of group effect after adjustment for blood pressure, body mass index, age, gender, duration of diabetes and glycated haemoglobin in multiple linear regression.
SD, standard deviation.

Course evaluation

In the post-sessional evaluations both groups scored highly, with health professionals significantly more so (Table 4).

The end-of-course evaluations did not show any significant differences in the perceived abilities of patients to describe aspects of diabetes and nutrition. Patients in the PADs group were asked additional questions. These included if they were happy to have been taught by peer advisers and also if they would have preferred to have been taught by SHPs. The average
score for the first question was 4.5 out of 5.0, with the average score for the second question being 2.2. In addition, participants felt that the PADs had a good grasp of the subject (4.2) and they felt confident with responses given by the PADs to questions asked (4.2).

Observations by health professionals
Health professionals had commented that the PADs did not encourage audience participation in the first course but this improved in subsequent courses. Corrections were made in the first session of course 1, when a PAD had omitted to mention insulin resistance as a cause of Type 2 diabetes. In the same course, one PAD had implied that sulphonylureas did not give rise to hypoglycaemia. Mistakes noted were not repeated by the PADs in subsequent courses.

Discussion
The aims of the present study were to assess the effectiveness and acceptability of PADs in delivering a training programme on self-management of diabetes to fellow patients. Effectiveness was judged by direct comparison with experienced SHPs delivering the same programme to randomly assigned patients. The change in knowledge from baseline was significantly increased in both groups. However, when multiple regression analysis was used to adjust the change in knowledge for baseline variables, no difference between groups was observed. Differences in outcomes for Diabetes Care Profile and for HbA1c were also not significant. The responses at the end-of-course assessments were similar in both groups, further attesting to the effectiveness of PADs in delivering training to fellow patients. In the post-sessional evaluations completed by patients, the SHPs' group responses were significantly stronger, although the actual scores in the PADs group were comparable. All the SHPs were known to the patients, whereas those in the PADs group were not at all acquainted with the presenters. It is not possible to judge how these factors might have affected the scoring in the evaluation questionnaires.

All patients in both groups completed the course; there was no significant difference in the attendance record. Patients in the PADs group stated that they were happy to be taught by
Lay-led trainers should receive regular updates and appraisals, for clearer definitions of functions and training required duties and training was noted [25]. This emphasizes the need community health workers in the USA, a wide variability in the advisers would be expected to participate. In a recent review of have to be tailored to the specific programme in which peer further training should they be interested in teaching. How-

and advice. Graduates of this programme could undertake
general programme in diabetes, with the object of enabling
alternative shorter training programme would be to offer a for this was 18 weeks. This was found to be too intense. An
campaigners and committee members; the training programme
tasks, such as one-to-one consultations, and to be effective people with diabetes to be able to perform a number of different
The literature on the subject of training lay tutors in diabetes judged to be fit to undertake lay-led education for their peers.

for clarification of issues pertaining to organizational and clinical governance.

Competing interests
Nothing to declare.

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