Evaluation of a structured educational programme for type 2 diabetes patients seen in private practice

C. Boegner\textsuperscript{a,}\textsuperscript{*}, A. Fontbonne\textsuperscript{b}, M.-F. Gras Vidal\textsuperscript{c}, P. Moul\textsuperscript{e}, L. Monnier\textsuperscript{a},

on behalf of the Diab Educ association

\textsuperscript{a} Department of Metabolic Diseases, Lapeyronie Hospital, 371, avenue Doyen G.-Giraud, 34295 Montpellier cedex 5, France
\textsuperscript{b} IRD-UR024, Epidemiology and Prevention, Montpellier, France
\textsuperscript{c} Maison des professions libérales, Montpellier, France

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Abstract

\textbf{Aim.} – Structured education is necessary in the management of a chronic disease such as diabetes and should be readily offered to patients in different settings. Our aim was to demonstrate the feasibility and advantages of a group education programme for type 2 diabetic patients in a private setting in France.

\textbf{Methods.} – A programme of group education for patients with type 2 diabetes was initiated by a multidisciplinary group of volunteer healthcare providers, including general practitioners, specialists in diabetology and non-medical members. All volunteers received one day of training, and physicians were instructed to organize several sessions of group education for the type 2 diabetic patients who regularly attended their practice. The first 427 patients entering the programme were included in the study, and asked to fill in a questionnaire to assess their knowledge, beliefs and behaviours with regard to diabetes. Their physician filled in a medical form. Six months later, the same questionnaire and form were sent for follow-up information.

\textbf{Results.} – At six months versus baseline, patients exhibited small, but consistent, improvements: (i) fasting glucose $142 \pm 42$ mg/dL ($P < 0.04$) vs $146 \pm 44$ mg/dL ($P < 0.04$); (ii) HbA\textsubscript{c} $7.41 \pm 1.26\%$ vs $7.57 \pm 1.33\%$ ($P < 0.01$); and (iii) all of the main parameters of diabetes self-management recorded in the study. The percentage of patients who inspected their feet at least once a week increased from 67 to 77% ($P < 0.001$). Patients improved their knowledge of the disease and developed a more positive attitude towards their diabetes.

\textbf{Conclusion.} – Our study demonstrates that it is possible to organize educational sessions for diabetic patients in a private-practice setting. At six months, patients receiving these sessions showed benefits in terms of blood glucose control and other important markers of self-management of their disease.

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Résumé

Évaluation d’un programme d’éducation thérapeutique pour les diabétiques de type 2 en médecine libérale.

\textbf{Objectif.} – La prise en charge d’une maladie chronique comme le diabète de type 2 nécessite une éducation thérapeutique structurée. Nous avons mis en place un système d’éducation de groupe pour ces patients en médecine libérale en France.

\textbf{Méthodes.} – Un programme d’éducation de groupe pour des patients diabétiques de type 2 a été mis au point par des médecins français. Des médecins généralistes et des spécialistes en diabétologie ont participé à ce programme en collaboration avec des paramédicaux. Tous les participants recevaient sur une journée une formation à l’éducation thérapeutique pour ultérieurement organiser des séances d’éducation thérapeutique à leur cabinet. Les 427 premiers patients à participer à une session d’éducation thérapeutique ont fait l’objet de cette étude. Ils devaient remplir un questionnaire sur leurs connaissances, leurs croyances et leur comportement concernant la prise en charge de leur diabète. Les médecins remplissaient un questionnaire médical. Six mois plus tard, ils remplissaient à nouveau les mêmes questionnaires.

\textsuperscript{*} Corresponding author.

\textit{E-mail address:} c-boegner@chu-montpellier.fr (C. Boegner).

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1. Introduction

The burden of type 2 diabetes is a major concern worldwide. In France, as in other parts of the world, the ever-increasing rate of patients developing type 2 diabetes is due to such known factors as growing obesity and ageing of the population as a whole. Epidemiologists are predicting an epidemic of type 2 diabetes in the near future [1,2]. Numerous studies have identified modifiable risk factors for preventing either the development or progression of the disease and its related complications. These trials included lifestyle interventions and have established that the clinical care of patients with diabetes requires, first, the progressive implementation of multidrug therapies, including antidiabetic, antihypertensive and lipid-lowering agents [3] and, second, more stringent follow-up that we call ‘educational programmes’ for diabetes [4]. Different strategies for the improvement of glycaemic control have been studied, and clinician education is also effective, as shown by a review by Norris et al. [5] and, more recently, by Shojania et al. [6]. In this context, the French medical authorities have decided that the management of chronic disease, and particularly of diabetes, should be handled on a nationwide basis. However, even though diabetes education is currently available in many inpatient hospital units, educational programmes are rarely offered to patients seen in private practices [7]. Based on these observations, the National Health Insurance System decided several years ago to fund an experimental programme of new networks to bring together healthcare professionals and patients, were volunteers. This report concerns the healthcare professionals and patients from the Languedoc-Roussillon, a region of France with approximately two million inhabitants.

The educational programme and teaching materials were designed and supervised by a university-based expert (L.M.). He was also deeply involved in the training of the practitioners in this programme. Both the practitioners and non-medical healthcare providers attended an initial one-day training session of group diabetic education, which consisted of a two-hour session with a specialist in education and training for groups using the educational material. Participants were encouraged to adopt a patient-empowering approach. All practitioners received the same educational materials—mainly booklets and slides.

The programme was inspired by one previously implemented at the hospital several years ago. At that time, four to eight patients participated in each session and could be accompanied by their spouse. A paramedical member of the staff—either a dietitian, nurse or podiatrist selected by the physician—assisted the practitioner during each session.

During the session, different topics were discussed in an informal way. Participants were encouraged to express and exchange opinions among themselves. The paramedical member led the discussion, and the medical doctor gave medical advice when necessary.

The current programme involved two separate half-day sessions of diabetes education. The first session covered dietary recommendations, and the patients’ knowledge of food and dietary management of the disease. The patients were asked to classify food cards according to the main nutrient. The principles behind the dietary measures were further explained in general. Carbohydrate equivalences were discussed as well as meal planning. Comments were mainly focused on how to read food labels, how to evaluate the sizes of food servings and how to use household measures to do this. The second session dealt with the basic pathophysiology of the disease to explain the importance of the dietary prescriptions and physical activity instructions associated with pharmacological treatments. Complications were discussed and counselling for the prevention of diabetic foot lesions was given.
The physicians were instructed to organize their own office group educational sessions for the type 2 diabetic patients who regularly attended their practice. Patients were asked during regular visits if they would like to participate; this possibility was offered to all patients, with no selection involved. The physicians entering the programme agreed to organize at least three group meetings per year, and to enroll at least a total of 10 of their type 2 diabetic patients into the programme.

This experiment was financially supported by the union régionale des caisses d’assurance maladie (URCAM) under the umbrella of new professional networks. Its sponsorship covered both the medical and paramedical costs of the group sessions as well as the training seminars.

3. Data collection

Data were collected for all patients who had attended one or more of the first four sessions organized by participating physicians, or one or more of the sessions organized up to 12 April 2005 if their physician had organized fewer than four sessions by that date. All participating health professionals who had trained from the beginning of 2003 to the end of the first quarter of 2004, and had organized at least one diabetes educational session during the six-month period that followed their training, were included in the present evaluation.

Each patient signed a written consent form and was given a card granting access to his own medical data on the Diabeduc website. Approval from the local ethics committee was obtained. For each patient, the practitioner had to fill in a medical questionnaire covering the usual patient characteristics at baseline and after six months. The questionnaire also contained items on the last fasting glycaemic measures and glycated haemoglobin, parameters that were measured by the patient’s usual laboratory.

Patients answered a self-questionnaire at the time of participation in the first group session, and were asked to complete the same questionnaire mailed to their home six months later and to mail it back to the evaluator using an addressed prepaid envelope.

The questionnaire took around 20 minutes to complete. The items were slightly modified from the initial ASAVED questionnaire devised by Chwalow [8], and concerned many aspects of living with diabetes. Questions dealt with the patients’ general knowledge of diabetes and its complications, opinions on diabetes and its treatment, including the influence of body weight and exercise on blood glucose, foot care and blood glucose monitoring. Other items explored the quality of life, and quality of support provided by family members and health professionals, as well as beliefs about diabetes and how well patients lived with the disease. Data were collected and computerized by an external evaluator chosen by the funding institution.

4. Statistical analysis

Comparisons between respondents and non-respondents were performed using the chi-square test for qualitative variables and Wilcoxon’s two-sample test for quantitative ones. Changes seen between baseline and six months were assessed by mean differences for quantitative variables, and tested against the null hypothesis by Student’s paired t test. For qualitative variables, differences in proportions between baseline and six months were tested with the McNemar test. A P value of less than 0.05 was considered statistically significant. All statistical analyses were performed with the SAS statistical software, version 9.1 (SAS Institute, Cary, NC, USA).

5. Results

During the study period, 47 practitioners were trained (16 general practitioners and 31 diabetologists). Of these, 37 (12 general practitioners and 25 diabetologists) started group diabetes education sessions, and organized a total of 111 sessions over the study period, an average of 3.0 sessions per practice. These sessions involved 427 patients, an average of 11.5 patients per practice and 3.9 patients per session; 52% of these patients attended both the session on dietary measures and on diabetes treatment. The baseline characteristics of the patients are presented in Table 1. The patients were 64.6 ± 10.0 years of age and had been diabetic for 11.5 ± 12.2 years. Mean body mass index (BMI) was 28.9 kg/m². The percentage of patients having one or more diabetes complication(s) was high (39%), with 62.4% treated for hypertension; 50% were dyslipidaemic. Most

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Baseline demographic data and patient characteristics (427 patients)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>64.6 ± 10.0</td>
</tr>
<tr>
<td>% &gt; 65 years</td>
<td>51.9</td>
</tr>
<tr>
<td>Men (%)</td>
<td>55.3</td>
</tr>
<tr>
<td>Age at onset of diabetes (years; mean ± S.D.)</td>
<td>53.0 ± 12.2</td>
</tr>
<tr>
<td>Body mass index (kg/m²) (mean ± S.D.)</td>
<td>28.9 ± 4.8</td>
</tr>
<tr>
<td>% overweight (BMI 25 – 30 kg/m²)</td>
<td>44.5</td>
</tr>
<tr>
<td>% obese (BMI ≥ 30 kg/m²)</td>
<td>35.4</td>
</tr>
<tr>
<td>% with diabetes complications</td>
<td>39.0</td>
</tr>
<tr>
<td>Cardiovascular risk factors</td>
<td></td>
</tr>
<tr>
<td>% hypertension</td>
<td>63.7</td>
</tr>
<tr>
<td>% dyslipidaemia</td>
<td>54.7</td>
</tr>
<tr>
<td>% smokers (current)</td>
<td>6.1</td>
</tr>
<tr>
<td>% sedentary</td>
<td>47.7</td>
</tr>
<tr>
<td>Schooling</td>
<td></td>
</tr>
<tr>
<td>% primary</td>
<td>28</td>
</tr>
<tr>
<td>% high school</td>
<td>27.5</td>
</tr>
<tr>
<td>% college</td>
<td>25.5</td>
</tr>
<tr>
<td>% university</td>
<td>19</td>
</tr>
<tr>
<td>Professionally active (%)</td>
<td>17.1</td>
</tr>
<tr>
<td>Social category</td>
<td></td>
</tr>
<tr>
<td>% farmers</td>
<td>17.8</td>
</tr>
<tr>
<td>% executives and senior executives</td>
<td>24.5</td>
</tr>
<tr>
<td>% professional intermediate</td>
<td>14.5</td>
</tr>
<tr>
<td>% technicians, employees</td>
<td>31.3</td>
</tr>
<tr>
<td>% factory workers</td>
<td>11.9</td>
</tr>
<tr>
<td>Those who already received diabetes education (%)</td>
<td>14.3</td>
</tr>
</tbody>
</table>

Data are given either as means ± S.D. or percentages.
patients were treated with one or more oral antidiabetic agent(s),
while 5.4% were using diet alone and 21.6% were using insulin.

At six months, 322 of the initial 427 patients (75%) returned a
follow-up questionnaire. Compared with non-responders, they
were slightly older (56% > 65 years vs 39%; \( P < 0.001 \)), had participated more often in a diabetes education programme (16% vs 8%; \( P < 0.03 \)), were more often members of a diabetic associ-
ation (10% vs 2%; \( P < 0.02 \)) and were less often smokers
(4% vs 13%; \( P < 0.001 \)) or sedentary (44% vs 58%; \( P < 0.01 \)).
Follow-up medical questionnaires were received for 348 patients
(81.5%), with no differences compared with patients whose
physicians failed to return the questionnaire. The outcome analy-
sis included in the medical questionnaire at the end of the
six-month period of follow-up is shown in Table 2. Compliance
with dietary measures was reported to be better at six months,
although the patients’ body weight remained stable. Patients’
levels of physical activity did not change during the study period.
The mean glycated haemoglobin levels decreased significantly,
from 7.57 ± 1.33% to 7.41 ± 1.26% (\( P < 0.01 \)), as well as the
fasting blood glucose, from 146 ± 44 mg/dL to 142 ± 42 mg/dL
(\( P < 0.04 \)). Treatments were intensified during the six-month
study period. In particular, the number of patients on insulin
therapy increased significantly, from 21.3 to 26.2% (\( P < 0.0001 \)).
Glycated haemoglobin decreased more in patients who were
transferred to insulin (−0.44%; \( P < 0.07 \)) than in patients who
remained on oral antidiabetic treatment (−0.09%; \( P < 0.16 \)),
in patients who were already on insulin at baseline (−0.31%; \( P < 0.02 \)) than in patients who were on oral antidiabetic drugs
(−0.12%; \( P < 0.07 \)) or diet alone (−0.06%; \( P < 0.67 \)), and in
patients with shorter diabetes duration (−0.20% if < 5 years
(\( P < 0.03 \)); −0.13 if 5–10 years (\( P < 0.07 \)); −0.06 if > 10 years
\( P < 0.42 \)). The number of patients treated for dyslipidaemia
also increased significantly, from 50.1 to 59.4% (\( P < 0.0001 \)).
Both systolic and diastolic blood pressure values remained sta-
ble, and approached the French recommendations by the haute
autorité de santé (HAS). Smokers were rarely encountered at
baseline (6.2%) and decreased slightly at six months to 4.0%.

Data from the self-questionnaires are shown in Table 3. One
set of items explored knowledge of diabetes and understanding
of diabetes management. The patient’s self-assessment rating
of their understanding of the disease increased from 55.8% at
baseline to 71.6% (\( P < 0.0001 \)) after six months. Patients signif-
ically less often expressed the need to see a dietitian (from 69.9
to 57.3%; \( P < 0.001 \)). Another set of questions concerned their
day-to-day diabetes management, mainly dietary compliance,
246
blood glucose monitoring and foot inspection. The number of
patients who regularly monitored their blood glucose increased
from 77.7 to 81.6% (\( P < 0.02 \)). Foot self-inspection increased
from 67 to 77% (\( P < 0.001 \)) among those who inspected their
feet at least once a week, and from 28.5 to 36.6% (\( P < 0.001 \))
among those who regularly used a podiatrist. Other items
explored patients’ beliefs as well as opinions and, to a certain
degree, what they felt about having diabetes. Scores were con-
structed by grouping ‘appropriate opinions’ (agreement with the
following statements: ‘if I lose weight, my diabetes will be
better controlled’, ‘physical activity can help me control
my diabetes’, ‘being compliant with my treatment can help me
control my diabetes’, ‘I’ll have diabetes all my life’, ‘diabetes
is a serious disease’) and ‘inappropriate opinions’ (agreement
with the following statements: ‘if complications must arrive,
they’ll arrive immediately’, ‘I can control my diabetes just by
avoiding sweet foods’, ‘whether or not I use drugs, I can’t con-

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Table 2
Six-month progression of data from baseline medical charts (for 348 patients)

<table>
<thead>
<tr>
<th></th>
<th>T0</th>
<th>T6</th>
<th>Difference (T6 − T0) (95% CI)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight (kg)</td>
<td>80.2 ± 14.6</td>
<td>80.2 ± 14.4</td>
<td>0.04 (−0.9 to +0.6)</td>
<td>0.87</td>
</tr>
<tr>
<td>Systolic blood pressure (mmHg)</td>
<td>136.6 ± 12.9</td>
<td>135.8 ± 13.5</td>
<td>−0.84 (−2.29 to +0.61)</td>
<td>0.26</td>
</tr>
<tr>
<td>Diastolic blood pressure (mmHg)</td>
<td>76.9 ± 7.4</td>
<td>76.2 ± 8.0</td>
<td>−0.66 (−1.56 to +0.24)</td>
<td>0.15</td>
</tr>
<tr>
<td>HbA1c (%)</td>
<td>7.57 ± 1.33</td>
<td>7.41 ± 1.26</td>
<td>−0.16 (−0.27 to −0.05)</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Fasting glycaemia (mg/dL)</td>
<td>146 ± 44</td>
<td>142 ± 42</td>
<td>−0.05 (−0.10 to −0.01)</td>
<td>&lt;0.04</td>
</tr>
<tr>
<td>Sedentary (%)</td>
<td>50.8</td>
<td>47.4</td>
<td></td>
<td>0.22</td>
</tr>
</tbody>
</table>

For each variable, the number of patients for whom data are given at baseline and at six months is indicated in parentheses.

Data are presented as % or means ± S.D.

P value: by McNemar test for qualitative variables; Student’s paired t test for quantitative variables.

Table 3
Six-month progression of data from patients’ questionnaire (N=322).

<table>
<thead>
<tr>
<th>Questions exploring the dimension of knowledge</th>
<th>T0</th>
<th>T6</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>% who already had formal diabetes education sessions</td>
<td>16.4</td>
<td>41.7</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>% often or very often sought information on diabetes</td>
<td>37.6</td>
<td>36.3</td>
<td>0.66</td>
</tr>
<tr>
<td>% who judged their understanding of diabetes as good or very good</td>
<td>55.8</td>
<td>71.6</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>% who would like the help of a dietitian</td>
<td>69.9</td>
<td>57.3</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>‘True’ or ‘False’ answers</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>‘When one is diabetic, the body cannot assimilate carbohydrates’</td>
<td>54.9</td>
<td>62.5</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>% exact answers</td>
<td>21.2</td>
<td>15.3</td>
<td></td>
</tr>
<tr>
<td>‘Diabetes can cause complications in the eyes and kidneys in the long term’</td>
<td>98.4</td>
<td>99.7</td>
<td>&lt;0.10</td>
</tr>
<tr>
<td>% exact answers</td>
<td>1.6</td>
<td>0.3</td>
<td></td>
</tr>
<tr>
<td>‘Diabetes increases the risk of suffering from cardiovascular diseases’</td>
<td>91.6</td>
<td>95.8</td>
<td>&lt;0.06</td>
</tr>
<tr>
<td>% exact answers</td>
<td>7.1</td>
<td>3.5</td>
<td></td>
</tr>
<tr>
<td>% don’t know</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Questions exploring the dimension of behaviour</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Of patients considering themselves on a diet</td>
<td>46</td>
<td>42</td>
<td>&lt;0.23</td>
</tr>
<tr>
<td>% who say they comply well with the diet</td>
<td>47</td>
<td>52</td>
<td></td>
</tr>
<tr>
<td>% who say they comply more or less</td>
<td>7</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>% who say they do not comply well</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequency of foot self-examination</td>
<td>67</td>
<td>77</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>% at least once a week</td>
<td>7</td>
<td>18</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>% about once a month</td>
<td>15</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>% less frequently</td>
<td>28.5</td>
<td>36.6</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Patients performing blood glucose self-monitoring (%)</td>
<td>77.7</td>
<td>81.6</td>
<td>&lt;0.02</td>
</tr>
</tbody>
</table>

For each parameter, the number of patients for whom data are presented is given in parentheses. P value by McNemar test.
their reasons for not doing so, they claimed a lack of time, an office space that was not big enough for a group session or having patients who were not motivated and difficult to convince to participate.

At six months, a number of patients lacked follow-up data. This was due in part to the fact that many patients with diabetes were mostly followed-up by their general practitioner and did not necessarily visit a diabetologist during the six-month period. Despite these limitations, we believe that our results accurately reveal the patients’ participation in the diabetes education sessions. However, we cannot exclude several biases. For instance, the patients were all volunteers and, as such, are different from the type 2 diabetic population in general. Interestingly, on comparing our sample of patients with that of the ENTRED study [11] or the MEDIAB observational study [12], our population was similar in terms of the percentage of patients greater than 65 years of age (54% in ENTRED vs 52% in our study), percentage who were male (54% vs 55%) and median age at onset of diabetes (54 years vs 53 years).

Another limitation was the duration of the training programme—only eight hours—for healthcare providers, both physicians and non-physicians. This was a compromise between a short baseline training period and a more complete one lasting several days. We were reluctant to offer more lengthy training because we believed that it would deter practitioners from participating in the programme. However, many participants, especially the diabetologists, had already benefited from other training sessions on educational topics.

We did not compare the results of the general practitioner education and specialist education, as the diabetic population seen by general practitioners and by specialists is not the same, as demonstrated by the ECODIA study [13]. The unique aspect of our programme was that both medical doctors and paramedical staff were trained and participated together in the group sessions, whereas most programmes are only supervised by specialists [14] or held by specialized diabetes educators [15].

Half of the education time was dedicated to nutritional education, as dietary compliance is a major problem in the general population of type 2 diabetic patients. A study carried out in Northern France showed that poor patient knowledge of diabetes resulted in poor dietary control [16]. Our patient questionnaire confirmed this: at the beginning of the study, 69.9% wanted counselling on issues related to diet. At six months, the number of patients who wanted an interview with a dietitian had significantly dropped. Physical activity was promoted in general, although a specific exercise programme was not implemented, which very likely explains why there was no measurable impact (improvements) in levels of physical activity. Improving comprehension of the relationship between losing weight and improving metabolic parameters, and understanding the basis of medical decisions, probably contributed to better compliance with treatment and recommendations. Emphasis was put on foot care and on preventing the onset of trophic disorders, an important aspect of the burden of type 2 diabetes [17]. The group setting made patients interact in a different way from their usual visits, and group education promotes peer education [18]. In some cases, group education has also been shown to produce better results than individual education [5,19].

Evaluation of the impact of the programme was done through a questionnaire that had been modified to deal with the specific aspects of diabetes management covered during the group sessions as well as with quality of life. The questionnaire was designed to explore any interim action that could be taken.

Patient education is a complex intervention and difficult to evaluate. Comparing our intervention with other programmes should be done with caution, as all studies have different designs and are concerned with different populations, as emphasized by many authors [20].

Nevertheless, is it possible to compare our programme with others? In German programmes, there was no decrease in HbA1c, although a 2.7-kg weight loss was observed after one year. However, these studies were performed in the late 1980s [21]. In the Sarkadi and Rosenqvist study conducted by pharmacists [10], the maximum decrease in HbA1c was observed at six months. This decrease remained stable (~0.4% at two years), but the education programme had no effect on BMI. The studies conducted by Trento et al. [19,22] showed that education prevented deterioration of HbA1c over time, and the BMI decreased by 1.4 kg/m² in patients who received a group education follow-up compared with individual education. More recently, a meta-regression analysis compared different types of interventions aimed at improving diabetes care. The results of 38 trials of clinical education were analyzed, and the authors reported a 0.15% mean decrease in HbA1c [6]. They also noted that improvements were greater in the trials of a small number of patients compared with those involving large populations. Even though their education programmes were more intensively conducted than those offered to our patients, the clinical outcomes were similar.

Clinical education is not the only strategy tested for improving glycaemic control. In the meta-regression analysis of Shojania et al. [6], the decrease in HbA1c was particularly marked when team changes and case-management strategies were undertaken. As stated by Mühlhauser, diabetes education cannot be separated from diabetes care in general [20]. Over the past few years, many single- or multitargeted trials [3] have demonstrated that management of type 2 diabetes across all patient age groups requires a structured and intensified approach. For instance, the treatment of diabetes should not be limited solely to the management of glycaemic disorders, but should also cover cardiovascular risk factors such as hypertension, dyslipidaemia, sedentary behaviour, smoking and dietary control. These are all well-known factors for insulin resistance and the proinflammatory process encountered in diabetes. Such an integrated therapeutic approach applied for nearly eight years to high-risk type 2 diabetic patients reduced, by around 50%, the relative risks of macro- and microangiopathy [3]. Despite limitations, our programme was consistent with such a multitargeted approach [23]. Indeed, a more prolonged analysis would help to evaluate the impact of our programme on the long-term complications of type 2 diabetes.
7. Conclusion

The present study provided data concerning the feasibility of implementing a group diabetes education programme in primary care and in a specialist subset of French patients with type 2 diabetes. At six months, patients exhibited small improvements from baseline in fasting glucose and in all the main parameters of diabetes self-management assessed in the study. Patients improved their knowledge of the disease and developed a more positive attitude towards their diabetes.

The results demonstrate that such a group programme, although limited in duration, favours better glycaemic control and overall management of the disease. It is to be hoped that we will be able to attract to diabetes education those patients who are younger and who have a higher baseline HbA1C. In the management of a chronic disease such as diabetes, structured diabetic education is necessary. As medical care is becoming increasingly more technical, it is important that physicians and other healthcare providers collaborate in educational programmes. Such programmes require an expertise and knowledge of the disease, and emphasize patient-empowerment techniques. The present data support the position of many experts, who claim that multitargeted aggressive management is necessary to reduce diabetes complications, and these goals require the intervention of multidisciplinary patient education.

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