

Delivering diabetes education in the community to meet local needs

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Article points

1. Diabetes education is critical for effective self-management.
2. Due to lack of access to diabetes education for people with type 2 diabetes, a structured education programme was developed, delivered and evaluated.
3. Group education programmes provide peer support and are an effective way to deliver education.
4. The Community Orientated Diabetes Education programme is delivered at local centres over 3 successive weeks with follow-up appraisal and support sessions at 7 weeks and 6 months.

Key words

- Structured education
- Community

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Many people living in the Republic of Ireland have poor access to community diabetes services (Diabetes Service Development Group, 2002). This is mainly due to the way health services are organised, which differs substantially from those in the UK (Corrigan et al, 2006). Following a literature review, the main components for a structured education programme were decided upon, and the Community Orientated Diabetes Education (CODE) programme was developed. This article reports on the development, rollout and evaluation of the CODE programme for people with type 2 diabetes (CODET2).

Diabetes education is a critical component of diabetes treatment and the cornerstone of good diabetes management. However, there is no conclusive evidence of the effectiveness of diabetes education on clinical outcomes or quality of life. Nevertheless, educational programmes have been shown to improve clinical outcomes (Norris et al, 2001; Norris et al, 2002; Mensing et al, 2005; American Association of Clinical Endocrinologists, 2007). In addition, diabetes education is necessary to empower people with diabetes to make informed choices about the management of their condition (Funnell and Anderson, 2003). Evidence suggests that education also has an overall beneficial impact on health and psychosocial outcomes (Rickheim et al, 2002).

The evidence supporting the short-term clinical benefits of diabetes education was used to secure funding to develop and deliver the Community Orientated Diabetes Education (CODE) programme (Diabetes Federation of Ireland, 2007). The umbrella CODE programme includes a general awareness campaign, supportive interventions for people with type 1 diabetes (CODET1) and their families (CODET1P), and a structured education programme for people with type 2 diabetes (CODET2). CODE was developed as a structured education programme with a stated philosophy, trained facilitators, interventions based on needs assessment, and evaluation and audit of the various components of the programme used to justify expansion of CODE (Diabetes Federation of Ireland,

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1. The CODE programme supports and supplements care from the individual's own diabetes team so that his or her knowledge and skills are reinforced, and the taking of responsibility for personal self-management of diabetes is gradually strengthened.
2. It is up to the individuals themselves to evaluate the benefits and drawbacks of any action or inaction, so that they are making an informed choice.

2007). The CODE programme is based on the following conceptual models: adult learning, health belief and the transtheoretical model. The aim of the programme is to achieve behavioural change through a mutually agreed course of action.

Philosophy of the CODE programme

The philosophy of the CODE programme is based on empowerment, empathy and self-efficacy:

“The CODE programme supports people with diabetes through group learning and participation. It encourages participants to become confident in their diabetes self care management and aims to improve quality of life through informed decision making.” (Diabetes Federation of Ireland, 2007)

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The CODE programme incorporates a dynamic process with sufficient flexibility to enable people with diabetes to talk in a supportive atmosphere about their condition for the benefit of all in the group. It is up to the individuals themselves to evaluate the benefits and drawbacks of any action or inaction, so that they are making an informed choice. It is through this personal evaluation that inner motivation is reinforced by the individual perceiving themselves to have a choice.

Training

Four diabetes specialists from nursing and dietetic backgrounds were trained in motivational interviewing, facilitating

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2. The curriculum was reviewed and updated based on these findings.

skills, problem solving, and goal setting to a nationally recognised FETAC (Further Education and Training Awards Council) level. Motivational interviewing allows people with diabetes to think about and verbally express their own views while overcoming their barriers to change (Burke et al, 2001). The facilitating skills of educators shift the balance of group management more toward the participants, and assist individual needs assessment and goal setting (Rizzotto, 2005). Setting realistic and achievable goals is the first step in improving motivation and building confidence (Weiss, 2006).

Community Orientated Diabetes Education for people with Type 2 diabetes (CODET2): Pilot

The first seven CODET2 programmes, delivered as a pilot, with the content based on a suggested national curriculum (International Diabetes Federation, 2002) were used to explore participants' experiences of living with diabetes, understand their attitude to the condition and identify key

informational needs. Three factors figured prominently in the assessment: a desire to talk frankly about living with diabetes; a need for more information, particularly regarding diet; and a desire to be able to make better decisions to facilitate good diabetes control. In addition, the baseline data provided an indication of areas that require special attention – explanation of results, why self-management behaviours are important and the interaction of self-management behaviours with diabetes outcomes. The curriculum was reviewed and updated based on these findings (see *Box 1*). Chapman-Novakofski et al (2004) recommended the importance of using evaluation to focus programme content. Evaluation results from the pilots were reviewed by the educators, and it was decided that it may be more appropriate to focus on more basic knowledge; for example focusing on what fats, carbohydrates and proteins are, rather than more complex food choices and reading nutritional labels. Ethical approval and informed consent procedures were adhered to.

Delivery of the CODET2 programme

Following the pilots described above, the CODET2 programme was advertised to professionals through various journals, such as *Forum*, *World of Irish Nursing*, and *Community Nursing*. The programme is delivered over 3 successive weeks with follow up appraisal and support sessions at 7 weeks and 6 months. During 2007, 26 programmes were delivered throughout the Republic of Ireland. Recruitment of participants was initially only through primary care practices that had limited access to community services, but is now extended to all primary care practices expressing an interest.

Assessing the CODET2 programme

The purpose of the current study into the CODET2 programme was to audit the delivery of the service and to evaluate the effectiveness of the programme in order to further develop it to meet the needs of people with diabetes. Evaluation of each

Box 1. The CODET2 curriculum.

Each session begins with a review of the previous session and a discussion of any ensuing questions. Participants' experiences and questions are used to inform content and discuss psychosocial, coping and other issues identified by the group.

Session 1

Introduction of the group and discussion of participants' experience of living with diabetes and their perceived needs. Discussion ends when participants decide on their desired outcome from attendance at this programme and set goals.

Session 2

Discussion on the self-management behaviours necessary to achieve good diabetes control and how each behaviour contributes to achieving this.

Session 3

Discussion of the consequences of not maintaining optimum control and how to ensure early detection of medical problems.

Session 4

Areas discussed at previous sessions are noted by the facilitator so that by session 4 any topics not already covered to meet the standards of diabetes self-management education can be discussed.

Session 5

Discussion of participants' progress, identification of facilitating factors that other participants could adapt for themselves or barriers that impede progression to the desired goal, and discussion on how to overcome obstacles by planning ahead and foreseeing problem areas.

programme occurs before the first session, after the fourth session and at 6 months (see *Box 2* for evaluation criteria). Professionals' views on the effects of the programme on their patients were collected by interview and reported verbatim. All participants attending the programme were invited to participate in the evaluation and were provided with information and a consent form in A4 booklet form.

Data analysis

After double checking for accuracy and errors, data were analysed. Chi-square and *t*-tests were used to determine whether changes had occurred in the criteria evaluated.

Results

Results for the 26 CODET2 programmes delivered during 2007 indicate that, on average, 13 people enrolled for each programme with only one individual lost to follow up – resulting in a total of 179 men and 158 women. The length of time participants had been diagnosed with diabetes varied from newly diagnosed to 35 years (mean 6.2 years, standard deviation 6.4 years) with baseline characteristics as shown in *Table 1*.

Quantitative results

Analysis of the results from the evaluation of the CODET2 programme found significant improvement in participants' understanding of their condition – over half had made behaviour changes that positively impacted on their overall health: for example, increased weight loss, reduction in cholesterol and waist circumference (*Table 2*). More importantly, there was a significant increase in participants' knowledge scores, coping ability, motivation to change and ability to make informed decisions about their diabetes.

Qualitative results

Participants were asked to review their experiences of attending the programme.

Box 2. Evaluation criteria for CODET2.

- HbA_{1c}. Measured at baseline and 6 months.
- Cholesterol. Measured at baseline and 6 months.
- Weight loss. Based on weight at week 1, week 7 and 6 months.
- Blood pressure. Based on values at week 1, week 7 and 6 months.
- Dietary intake. Measured by a modified version of the Short Fat Questionnaire (Dobson et al, 1993) at week 1 and 6 months.
- Physical activity. Measured by the Leisure-time Exercise Questionnaire (Godin et al, 1986) at week 1 and 6 months.
- General diabetes knowledge. Measured by the Diabetes Knowledge Questionnaire (Diabetes Federation of Ireland, 2003) at week 1 and week 7.
- Qualitative review through semi-structured interviewing to examine the satisfaction of attending this type of programme. One person analysed this review by asking four predetermined questions, which were: How did you find attending the programme? Was the information given to you at an appropriate level? What do you think we should change before running this course again? What do you think about the venue?
- Diabetes-related psychosocial self-efficacy. Including the need for change, developing a plan, overcoming barriers, supporting oneself, coping with emotion, asking for support, motivating oneself, and making diabetes care choices appropriate for one's priorities and circumstances as measured by the Diabetes Empowerment Scale Short Form (Anderson et al, 2003).

Table 1. Baseline data for study participants.

Diabetes care provider	Percentage of participants
Primary care	6%
Secondary care	47%
No ongoing care	41%
Not answered	6%
Age (years)	
30–39	2%
40–49	6%
50–59	19%
60–69	35%
70 years and over	30%
Not answered	8%
BMI (kg/m²)	
18–24.9	6%
25–29.9	38%
30–34.9	32%
35–39.9	16%
40–44.9	7%
≥45	1%
Diabetes management	
Diet and exercise only	17%
Diet, exercise and medication	66%
Not answered	17%

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1. It is of concern that 41% of participants perceived that they had no ongoing diabetes care.
2. The CODE programme was developed on an action research basis (an iterative inquiry process, which is composed of a circle of planning, action, and fact-finding about the result of the action).
3. The qualitative results show that attendance on the programme was a positive experience for most participants.
4. The overall results demonstrate the effectiveness of delivering diabetes education at a community level in this manner.

Responses included:

“We never got anything like this before; I look forward to our meeting.”

“Now I am much better able to limit how much I eat... I feel more motivated.”

GPs also gave their views:

“Feedback from my patients has been superb. They are delighted to have such a well structured education course happening right on their doorstep. They are learning from each other and even at this early stage, I can see the difference in their attitude to their diabetes self-management.”

However, it is of concern that 41% of participants perceived that they had no ongoing diabetes care, which may have influenced the results (Table 1). Full results are downloadable from: http://www.diabetes.ie/website/content/20008_code_report.aspx (accessed 07.10.08).

Discussion

The CODE programme was developed on an action research basis (an iterative inquiry process, which is composed of a circle of planning, action, and fact-finding about the result of the action [McNiff and Whithead, 2002]) to facilitate alteration to the education programme in response to the initial evaluation. Evaluation incorporated four different levels; reaction, learning, behaviours and results (Kirkpatrick, 1994). The qualitative results show that attendance on the programme was a positive experience for most participants. Learning was assessed using a standardised knowledge quiz, which indicated positive trends in general diabetes knowledge. As knowledge assessment should be based on the learning objectives, knowledge assessment for sessions in 2008 was altered and is now based on the revised curriculum. Behavioural change was documented by self-report, but confirmed by changes in biomedical parameters. The overall results demonstrate the effectiveness of delivering diabetes education at a community level in this manner.

Current results suggest that the CODET2

Table 2. Improvements in physiological, psychological and biomedical markers over the course of the CODET2 programme.

Marker	Week 1 (mean)	Week 26 (mean)	P-value
Cholesterol (mmol/L)	3.9 (SD 0.87)	3.83 (SD 0.89)	0.177
HbA _{1c} (%)	7.30 (SD 1.47)	6.99 (SD 1.15)	0.091
Weight (kg)	84.54 (SD 15.9)	83.86 (SD 15.5)	0.027*
Waist circumference (cm)	101.1 (SD 12.36)	100.6 (SD 12.25)	0.313
Knowledge (QS)	6.42 (SD 3.9)	8.40 (SD 4.6)	0.000*
Coping self-efficacy (QS)	3.73 (SD 0.96)	4.15 (SD 0.64)	0.008*
Motivation (QS)	3.76 (SD 1.05)	4.17 (SD 0.62)	0.049*
Informed decision making (QS)	4.11 (SD 0.81)	4.31 (SD 0.56)	0.035*
Empowerment (QS)	30.60 (SD 5.0)	33.9 (SD 3.3)	0.004*
Mild exercise (walking; QS)	4.00 (SD 4.56)	5.29 (SD 6.31)	0.019
Moderate exercise (fast walking; QS)	2.52 (SD 2.78)	3.57 (SD 2.75)	0.027*
Strenuous exercise (jogging; QS)	0.487 (SD 1.29)	1.79 (SD 3.0)	0.012*
Fat intake (QS)	16.72 (SD 6.1)	15.15 (SD 6.2)	0.012*

* denotes statistical significance (P<0.05); SD: standard deviation; QS: Questionnaire score

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1. Engaging people in their own care, as is done through the CODET2 programme, is considered to be key to influencing self-management behaviours and optimising glycaemic control.
2. The CODE programme was developed to meet the needs of Irish people with diabetes who had difficulty accessing diabetes education and community services.
3. The majority of diabetes education is currently delivered through hospital settings with very limited primary care diabetes services, except in the midlands.
4. Evaluation has established that the CODE programme is responsive to local needs, can be delivered in local settings, is well accepted by patients and primary care professionals, assists people with diabetes to cope with their condition and empowers them to make informed choices about their diabetes.

programme is very well received by people with diabetes and their healthcare professionals. The extremely positive results may be accounted for by the perceived lack of access to professional care previously. The amount and quality of professional interaction correlates with medical outcomes (Von Korff et al, 1997). However, engaging people in their own care, as is done through the CODET2 programme, is considered to be key to influencing self-management behaviours and optimising glycaemic control (Skinner and Hampson, 2001) and diabetes education is a critical component of diabetes treatment (Padgett et al, 1988). The CODET2 programme provides diabetes education to people not currently receiving that service, and as such fits the recommendations of the Irish Health Service Executive (HSE) Transformation Agenda (HSE, 2007).

The CODE programme was developed to meet the needs of Irish people with diabetes who had difficulty accessing diabetes education and community services. Other structured education programmes such as DESMOND (Diabetes Education and Self Management for Ongoing and Newly Diagnosed) and X-PERT (eXpert Patient Education versus Routine Treatment) are also available in Ireland. DESMOND is delivered through Galway University Hospital and X-PERT through community dietitians in the South and North East of the country. However, the majority of diabetes education is currently delivered through hospital settings with very limited primary care diabetes services, except in the midlands (Diabetes Service Development Group, 2002).

Advantages

Delivering the CODET2 programme at community level has some special advantages:

- It allows the facilitator to have a direct experience of the community, and allows him or her to tailor the education to the reality of the participant's environment.
- Education in the community conveys a strong message to the participant – diabetes is part of everyday living and not part of a health service issue, only to be considered

when the date for a medical appointment is approaching.

Delivering diabetes education in a group setting also has advantages:

- It stimulates interaction, which facilitates vicarious learning.
- Shared experiences aid the coping mechanism.
- It addresses the currently uncoordinated patient education issues.

Disadvantages

A drawback of the programme is that the results need to be interpreted with due acknowledgement of local issues, such as timing of the programme, venue facilities and number of people with diabetes in the primary care practices from which participants were recruited. The chosen methodology offered the strongest research base to reflect the challenges and problems experienced in developing and delivering the CODE programme. Recruitment was through primary care practices by invitation from the participant's GP, with an unknown response rate bias. Positive findings for behaviour change were supported by other measures indicating that the reliance on self-report of behaviours was appropriate. Other issues are that:

- People can choose not to attend.
- Local venue facilities may not be suitable for group education.
- Primary practices may decline to participate.
- The educator is not known to the participants.

Conclusions

Evaluation has established that the CODE programme is responsive to local needs, can be delivered in local settings, is well accepted by patients and primary care professionals, assists people with diabetes to cope with their condition and empowers them to make informed choices about their diabetes. Results from this evaluation have resulted in some changes in the 2008 CODET2 programme. There is a reduced focus on quantitative data collection, which was found to be time consuming and intrusive. The literacy level of

materials used was reduced to better meet the needs of participants. The fourth session was altered to a telephone consultation to reduce costs and facilitates one-to-one private support. Ongoing evaluation will determine whether these changes are beneficial. In keeping with the development of a structured education programme, there is a focus on peer review and the quality assurance process for future CODET2 programmes. ■

American Association of Clinical Endocrinologists (2007) American Association of Clinical Endocrinologists medical guidelines for clinical practice for the management of diabetes mellitus. *Endocrine Practice* **13**(Suppl 1): 1–61

Anderson RM, Fitzgerald JT, Gruppen LD et al (2003) The Diabetes Empowerment Scale-Short Form (DES-SF). *Diabetes Care* **26**: 1641–42

Burke B, Arkowitz H, Dunn C (2001) The efficacy of motivational interviewing and its adaptations: What we know so far. In Miller WR, Rollnick S (eds) *Motivational Interviewing: Preparing People for Change*. 2nd Ed. Guilford Press, New York

Chapman-Novakofski K, DeBruine V, Derrick B (2004) Using evaluation to guide program content: Diabetes education. *Journal of Extension* **42**: 3

Corrigan M, Cupples M, Smith S et al (2006) The contribution of qualitative research in designing a complex intervention for secondary prevention of coronary heart disease in two different healthcare systems. *BMC Health Services Research* **6**: 90

Diabetes Federation of Ireland (2003) *Diabetes Knowledge Quiz, Professional Services Committee*. Diabetes Federation of Ireland, Dublin

Diabetes Federation of Ireland (2007) *Community Oriented Diabetes Education (CODE): A structured education programme for people with diabetes. Evaluation Report*. Diabetes Federation of Ireland, Dublin

Diabetes Service Development Group (2002) *Diabetes care: Securing the future*. Diabetes Federation of Ireland, Dublin

Dobson AJ, Blijlevens R, Alexander HM et al (1993) Short fat questionnaire: a self-administered measure of fat-intake behaviour. *Australian Journal of Advanced Nursing* **17**: 144–49.

Funnell MM, Anderson RM (2003) Patient empowerment: a look back, a look ahead. *Diabetes Educator* **29**: 454–64

Godin G, Jobin J, Bouillion J (1986) Assessment of leisure time exercise behavior by self-report: a concurrent validity study. *Canadian Journal of Public Health* **77**: 359–62

Health Service Executive (2007) *Transformation Programme 2007–2010*. Health Service Executive, Naas

International Diabetes Federation (2002) *Diabetes Education Modules*. IDF, Brussels

Kirkpatrick D (1994) *Evaluating Training Programs: The Four Levels*. Berrett-Koehler, San Francisco

McNiff J, Whithead J (2002) *Action Research: Principles and Practices*. 2nd Ed. Routledge, London

Mensing C, Boucher J, Cypress M et al (2005) National standards for diabetes self-management education. *Diabetes Care* **28**: S72–9

NICE (2006) *Guidelines on Patient Education Models for Diabetes*. NICE, London

Norris SL, Engelgau MM, Narayan KM (2001) Effectiveness of self-management training in type 2 diabetes: a systematic review of randomized controlled trials. *Diabetes Care* **24**: 561–87

Norris SL, Lau J, Smith SJ et al (2002) Self-management education for adults with type 2 diabetes: a meta-analysis of the effect on glycemic control. *Diabetes Care* **25**: 1159–1171

Padgett D, Mumford E, Hynes M, Carter R (1988) Meta-analysis of the effects of educational and psychosocial interventions on management of diabetes mellitus. *Journal of Clinical Epidemiology* **41**: 1007–30

Rickheim PL, Weaver TW, Flader JL, Kendall DM (2002) Assessment of group versus individual diabetes education: a randomized study. *Diabetes Care* **25**: 269–74

Rizzotto J (2005) Meal planning in groups. *Diabetes Spectrum* **18**: 132–4

Skinner T, Hampson S (2001) Personal models of diabetes in relation to self-care, well-being, and glycemic control. A prospective study in adolescence. *Diabetes Care* **24**: 824–33

Von Korff M, Gruman J, Schaefer J et al (1997) Collaborative management of chronic illness. *Annals of Internal Medicine* **127**: 1097–1102

Weiss M (2006) Empowerment: A patient perspective. *Diabetes Spectrum* **19**: 116–18

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