Community Orientated Diabetes Education (CODE)

A structured education programme for people with diabetes

Evaluation Report 2007

Supported by

Acknowledgements

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1.0 Introduction

The Diabetes Federation of Ireland structured diabetes education programme is based on the North Western HSE diabetes education programme and incorporates international best practice guidelines. The primary aim of the programme is to allow people with diabetes attending GP only care access to diabetes education, however, no individual was excluded because of attendance at secondary care centres.

Diabetes and its complications are responsible for a tremendous personal and public health burden of suffering at the present time. The ISPHO has predicted that the numbers of persons with diabetes will increase by 37% from 141,000 (2005) to 194,000 (2015) due to the explosion of obesity in Ireland. Definitive evidence of the benefits of improved glyceamic control for reducing the burden exists[1].

The diabetes care of a person with diabetes includes "diabetes self-management education" because the person with diabetes needs education to manage their food intake, physical activity and medication as an ongoing process[2]. Diabetes self-management education has been considered an important part of the clinical management of persons with diabetes since the 1930's and is now considered the cornerstone of care for all persons with diabetes to achieve successful health related outcomes[3]. Optimally, diabetes education should be delivered regularly to all people with diabetes in the primary and/or secondary clinical care setting by a multidisciplinary diabetes team.

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[1] UKPDS (1998) Intensive blood glucose control with sulphonylureas or insulin compared with conventional treatment and risk of complications in people with type 2 diabetes (UKPDS 33). *Lancet* 353, 837-853
[2] Mensing C., Boucher J., Cypress M.et al. (2002) National Standards for Diabetes Self-Management Education. *Diabetes Care*. 23, 140S-147
[3] Mensing C., Boucher J., Cypress M., et al. (2005) National Standards for Diabetes Self-Management Education. *Diabetes Care* 28 Suppl 1. S72-S79.

1.1 Diabetes Education

A large body of literature has developed in diabetes education and its efficacy with many quantitative studies showing positive effects[4]. However, to date there is insufficient evidence to support specific types of education or provide guidance on the setting for or frequency of sessions but good practice would be the delivery of diabetes education in a location accessible by all using a variety of teaching strategies and adapted to meet the individual needs, personal choices and learning styles of people with diabetes[5]. Empirical evidence supports actively involving people with diabetes in learning and exploring their feelings about having diabetes[6]. Health beliefs and personal understanding of diabetes and its treatment are considered to be the key factors influencing self-management, emotional well-being and glycaemic control[7]. Recent advances stress the psycho-behavioural approach to self-management education[8].

The majority of diabetes education in Ireland is given informally. Prior to the introduction of the Dose Adjusted For Normal Eating (DAFNE), E**X**pert **P**atient **E**ducation versus **R**outine **T**reatment (X-PERT) and Diabetes Education for Self-Management Ongoing and Newly Diagnosed (DESMOND) structured education programmes into Ireland, the delivery of diabetes education was not structured, nor did it have trained educators who were quality assured. This resulted in ad hoc development of group diabetes educational interventions, most of which are based on a professional-orientated perspective which ignores the expectations and capabilities of people with diabetes and pays little attention to the communication skills of professionals[9].

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[4] Norris S.L., Lau J., Smith S. J., Schmid C. H.& Engelgau M. (2002) Self-Management Education for Adults With Type 2 Diabetes: A meta-analysis of the effect on glycemic control. *Diabetes Care*. 25,7. 1159-1171.
[5] NICE Guidelines (2006) National Institute of Clinical Excellence Guidelines on Patient Education Models for Diabetes, London
[6] Funnell M.M. & Anderson R. (2002) Working toward the next generation of diabetes self-management education. *American Journal of Preventive Medicine*, **22** (4), Suppl 1, 3-5
[7] Skinner T.C. & Hampson S.E (2001) Personal models of diabetes in relation to self-care, wellbeing and glycaemic control. A prospective study in adolescence. *Diabetes Care* 24, 5, 828-833
[8] Via P.S (1999) Psychological Self-efficacy and Personal Characteristics of Veterans Attending an Education Program. *Diabetes Educator* 25.5. 727-737.
[9] Johnson M., Newman P., Jiwa M. et al. (2005) Meeting the educational needs of people at risk of diabetes related amputation : a vigette study with patients and professionals. *Health Expectations* 8.4, 324-333.

1.2 Diabetes Self-management

Diabetes self-management is complex with treatment recommendations on regulating carbohydrate and caloric intake and increasing physical activity difficult to incorporate into existing lifestyles[10]. It is these behaviours and lifestyle changes that are the keys to successful management of diabetes[11]. Because of the complexity of human behaviour, just giving information about the importance of changing lifestyle is often ineffective at motivating persons with diabetes to change[12]. Health behaviour models suggest effective methods for achieving behaviour change related to treatment regimes by stressing the remediation of skill deficits or using positive and negative reinforcement to modify performance[13]. Using behaviour change strategies, matching interventions with patient needs and abilities and having open communication and co-operation are critical to successful diabetes self-management[14].

[10] Whittemore R., D'Eramo Melkus G. & Grey M. (2005) Metabolic control, self-management and psychosocial adjustment in women with type 2 diabetes. *Journal of Clinical Nursing*. 14,2, 195-203.
[11] Rubin R. R., Peyrot M. & Saudek C. D. (1993) The Effect of a Diabetes Education Program Incorporating Coping Skills Training on Emotional Well-Being and Diabetes Self-Efficacy. *Diabetes Educator*. 19,3. 210-214.
[12] Clark D.D (1997) Physical Activity Efficacy And Effectiveness Among Older Adults And Minorities. Diabetes Care 20. 1176-1182.
[13] Elder J. P., Ayala G. X. & Harris S (1999) Theories and intervention approaches to health-behaviour change in primary care. *American Journal of Preventive Medicine*. 17, 4, 275-284
[14] Clement S. (1995) Diabetes Self-management Education. *Diabetes Care*. 11, 539-545.

2.0 CODE

Models such as the Health Belief Model[15], Theory of Planned Behaviour[16] and the Transtheoretical Model[17] are proposed to guide the understanding of human behaviour, behaviour change and motivation as well as to support the development of effective interventions. These models underpin the Community Orientated Diabetes Education (CODE) programme with the addition of the Adult Learning Model[18] in recognition that adults take instruction in a different manner depending on age, gender, educational status and socio-economic background.

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

> "CODE 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".

Empowerment positions the person with diabetes as the decision maker with the purpose of diabetes education being to ensure that the choices he/she makes each day living with diabetes are informed choices[19]. People are empowered when they solve problems or achieve goals by accessing and using their psychological, social, emotional and spiritual resources[8]. Empathy is the ability to understand the patient's experiences and feelings accurately; it also includes demonstrating that understanding to the patient[20]. Empathy acknowledges that the person with diabetes has a personal comprehension of diabetes that may be different from the

[15] Hochbaum G.M. (1958) *Public Participation in Medical Screening Programmes: A Sociopsychological Study*. PHS publication no. 572, Government Printing Office. Washington D.C.

[16] Fishbein M. & Ajzen J. (1975) *Beliefs, Attitudes, Intention and Behaviour. An Introduction to Theory and Research*. Addison-Wesley Publishing Company. Massachusetts, U.S.A.

[17] Prochaska J., DiClemente C. & Norcross J. (1993) In search of how people change: Application to addictive behaviour. *Diabetes Spectrum* **6**, 25-33.

[18] Kolb, D. A. Osland J. &. Rubin I. (1995) *Organizational Behaviour: An Experiential Approach to Human Behaviour in Organizations* 6e, Englewood Cliffs, NJ: Prentice Hall.

[19] Anderson R.M., Funnell M.M., Butler P.M et al. (1995) Patient empowerment. Results of a randomized controlled trial. *Diabetes Care*. 18, 943-949.

[19] Coulehan J.L. &. Block M.L (1999), *The Medical Interview Mastering Skills for Clinical Practice*, F.A. Davis, Philadelphia

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professional comprehension of diabetes and this must be considered as part of any diabetes educational programme. Empathy allows that the necessary degree of adaptation of diabetes self-management behaviours varies across the population and that adaptation may be influenced by individual health beliefs, support and barriers to change. The concept of self-efficacy proposes that a person's confidence of their ability to perform and carry out their goals is directly related to their success and as such predicts adherence to self-care behaviours in a medical regime[21].

2.1 Development of CODE

CODE developed as a direct result of enquires to the Diabetes Federation of Ireland lo-call helpline. People with diabetes rang the helpline seeking support to access community diabetes/dietitic services which they had no access to because they were attending a GP who was not part of a community pilot study or scheme. Investigation by the Federation showed widespread inequality of access to community services depending on the area of the country people resided in and the GP they attended. Discussion with HSE staff in the relevant areas indicated that expansion of the current schemes were unlikely. In order to address discrimination of people with diabetes because of their attendance at primary care centres not selected for inclusion in the "schemes", the Diabetes Federation set about organising diabetes education at primary care level.

The Diabetes Working Group recommended that delivery of diabetes care at primary care level could only develop with appropriate specialist services based at community level[22]. In 2006, the Diabetes Federation proposed organising diabetes educational courses at primary care level which HSE diabetes specialist staff could deliver based on the North Western Type 2 diabetes education programme which are delivered by local specialist nurses with administrative support from the Western Regional Office of the Diabetes Federation of Ireland. Due to the already stretched workload of HSE employed diabetes professionals, the

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[21] Bandura A. (1997) Self-efficacy: The Concept of Control. W.H. Freeman and company, New York.
[22] National Diabetes Working Group Report wwwdohc.ie/publications/2006 accessed 17th July 2007.

Federation agreed to employ four specialist diabetes professionals to develop and deliver a community based structured diabetes education programme.

In keeping with the recommendations for enhanced diabetes education, the educators were trained in motivational interviewing, facilitating groups, behaviour change and goal setting. Motivational interviewing is defined as

"a client-centred, directive method for enhancing intrinsic motivation to change by exploring and resolving ambivalence"

Burke et al. 2001 [23].

Motivational interviewing allows the person with diabetes to think about and verbally express their own views while overcoming their barriers to change. The tone set by the facilitator is non-judgmental, empathetic and encouraging within a non-confrontational and supportive environment. The person is assisted in understanding their own diabetes by comments from other people with diabetes who from their own personal experience may make suggestions for overcoming obstacles to change. This approach reduces the person's defensiveness, encourages participation in deciding what behaviour to focus on and assists in motivating the person to have a greater self-commitment to behaviour change[24].

Facilitating skills equip the teacher to work as a facilitator leading to more group participation and involvement with diabetes issues, ideas, and skills and shifts the balance of group management more toward the participants, and trusting them to be able to teach each other and learn from each other. An important element in group facilitation is to suppress the natural instinct to respond with direct questions or recommendations until the group have explored and gained understanding of the situation and made some suggestions for overcoming obstacles to change.

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23 Burke B.L., Arkoiwitz H & Dunn C (2001) The Efficacy of Motivational Interviewing and its Adaptions: What we know so far. In Miller W.R & Rollnick S (eds) Motivational Interviewing: Preparing People for Change. 2 nd Edition Guilford Press New York. 217-250
[24] Fisher K.L. (2006) Assessing Psychosocial Variables: A Tool for Diabetes Educators. Diabetes Educator 32.1. 51-57.

Behaviour change is rarely a discrete, single event; the person moves gradually from being uninterested (precontemplation stage) to considering a change (contemplation stage) to deciding and preparing to make a change. Using the framework of the Stages of Change model[17] the goal for a single encounter is a shift from the general (Get person with diabetes to change unhealthy behaviour) to the realistic (Identify the stage of change and engage person in a process to move to the next stage). Understanding a person's readiness to make change, appreciating barriers to change and helping persons anticipate relapse can improve patient satisfaction and lower frustration during the change process.

Goal setting is based on the assumption that goals are regulators of human action. Implicit in the goal is the achievement of a desired result. The first action in goal setting is the identification of the problem at hand. Problem solving is necessary when a person does not know how to proceed from a given state to a desired goal state. For many people with diabetes, the goal is diabetes control which can be considered a large scale goal. In order to achieve diabetes control, it is necessary to break diabetes control into smaller goals e.g. reduce food intake. Problem solving techniques allow the person to identify the necessary actions to achieve the goal and barriers that might disrupt positive action. Setting realistic achievable goals is the first step in improving motivation and building confidence.

2.2 Rollout of CODE

The CODE programme for people with Type 2 diabetes (CODET2) targeted people with diabetes and their carers who receive diabetes care at primary care level and have limited access to diabetes specialist professionals. General practitioners' (GPs) were identified by local branches of the Diabetes Federation of Ireland. The GP was contacted and offered the programme. Interested GPs were asked to identify suitable people with diabetes from their practice who would benefit from group diabetes education. To maintain confidentiality, printed letters provided by the Federation were addressed and posted by the practice. Interested participants telephoned the Federation, gave their personal details for

future contact and the first sixteen suitable callers were enrolled in the course. The first CODET2 commenced in January 2007 with a target to commence 26 programmes during 2007 which was achieved. This evaluation is based on the first four sessions of 26 courses and the complete programme of 18 courses.

The programme is delivered at local level either in the primary care practice, community centre, local hall or hotel depending on the facilities available. The venue is selected based on suitability, access, and availability of car parking and tea/coffee facilities. In 2007, a programme was delivered in counties Cork, Waterford, Galway, Cavan, Laois, Mayo, Louth, Kildare, Wicklow, Longford, Meath, Roscommon, Dublin North, Wexford, Kilkenny, Clare, Limerick, Kerry, and programmes commenced in Carlow, Donegal (2), Dublin South, Tipperary North, Westmeath, Tipperary South and Offaly.

2.3 Curriculum Development

During January and February 2007, the expectations of 97 participants attending the first 7 CODE programmes was used as a basic needs assessment which sought to explore the participants' experiences of living with diabetes, to understand their attitude to diabetes and current level of knowledge on diabetes self-management and to identify key informational needs.

The needs assessment was conducted at the initial session of each CODE programme and comprised of group discussion on current areas of concern self-managing diabetes and expectations in attending the programme. Each group was facilitated by a RDO, who made notes on a flip chart and asked the group to verify agreement with the concerns identified. In the group discussion, participants identified a number of issues they considered barriers to achieving glycaemic control e.g. complacency, poor personal choices, lack of knowledge.

Feedback form the needs assessment was used to adapt a comprehensive curriculum for CODET2 based on international recommendations. The

curriculum addresses all of the fundamental issues within the physiology of diabetes and the information required by a person with diabetes (See appendix 1).

Three factors figured prominently in the assessment: desire to talk frankly about life with diabetes and the difficulties encountered, need for more information particularly regarding diet and a desire to be able to make better decisions for their own diabetes self-management. In addition the baseline data provided an indication of areas that require special attention – explanation of medical results, why self management behaviours are important and the interaction of self-management behaviours on diabetes outcomes.

The participants' expectations from attending the CODE programme were predominately to learn more about diabetes but also to talk about life with diabetes with other people who share the same experiences. The majority attended because their doctor recommended them to attend and therefore, they perceived that attendance would benefit them medically.

The CODET2 programme curriculum is complemented by the diabetes education modules educational resource pack available to download on www.idf.org. In acknowledgement that medical information changes rapidly, the contents of the diabetes education modules will be regularly reviewed and out of date information altered by agreement of the Professional Services Committee (Diabetes Federation of Ireland).

The CODET2 programme is supported by literature which participants are asked to read. The North West Area HSE booklet, *Your Guide to Type 2 Diabetes* was selected as the most appropriate literature for participants and with approval from the HSE is used to supplement the oral components of the programme. In order to avoid confusion, the target levels identified in that booklet are used throughout the programme.

The manner in which the information is delivered is participant led and does not follow a chronological order. However, it is mandatory that all areas are covered

during the programme with documentation of the elements covered on the quality assurance checklist (See appendix 2).

Recognition is given to barriers of delivering group education and appropriate methods used to overcome them. Barriers include

- Literacy skills of the participants
- Language barriers
- Hearing impairments
- Mental health issues not declared/identified prior to acceptance on the programme
- Cultural barriers
- Individual choice.

2.4 Course Outline

The programme is delivered over three successive weeks with a follow up appraisal/support session at seven weeks (to support/motivate participants) and at 26 weeks. In total, there are five sessions per programme over a 26 week period, three to deliver the programme and two to facilitate personal and professional evaluation. Participants are aided in defining specific, measurable, appropriate, realistic goals for themselves and learning problem solving techniques to facility achieving them. The curriculum of each session is outlined in appendix 1.

Session 1 - provides participants with an opportunity to share their experience of diabetes, discuss their expectations of the course and identify their own role and responsibility in managing their diabetes. The session provides general back ground information on diabetes and diabetes care. By the end of the session, participants will be able to identify the type of diabetes they have, discuss how it is managed and identify their role in the self-management of the condition.

Session 2 - provides participants with the opportunity to discuss the self-management behaviours necessary to achieve diabetes control and how assessment of their own lifestyle and the changes possible, may contribute to

achieving improvement in one's own diabetes. Lifestyle issues regarding diet in diabetes, managing weight and general day to day management of food with diabetes are common areas for discussion. The session aims to provide general healthy eating advice and recommendations for managing Type 2 diabetes. At the end of the session, participants are able to identify their role in self management around food and how it affects glycaemic control.

Session 3 - highlights the need for early detection of problems and how to address them. It also focuses on the importance of regular screening and clarifies any issues. In addition, it highlights physical activity as an important lifestyle intervention. By the end of the session, participants will have engaged in discussion of the consequences of not maintaining optimum control and how to ensure early detection of medical problems.

The discussion establishes that diabetes is a serious, self-managed condition that requires an equal partnership between the person with diabetes and the diabetes team. It acknowledges that the participant's own diabetes team know what is best for their diabetes management but it is the participant that knows what is best for them on the basis of their priorities, own goals, values and feelings about their health. After a discussion in Session 1 on how to set goals, the session ends by asking each participant to set a six month goal. Participants are individually assisted in breaking down the goal into a short-term goal which is a realistic and achievable target. As a behavioural experiment for the following session, they are asked to record a food diary for a typical day and bring it to the second session. Education is provided through the response to questions, for example, statements about symptoms at diagnosis leads to a discussion on the symptoms of high blood sugar levels and the risk factors for type 2 diabetes. A question about blood results leads to review of information the importance of regular testing (by individual or professional), when, how to test and react to results.

Each session, begins with a review of the previous session and any ensuing questions, followed by the participants efforts towards achieving their personal goal set at the previous session. The participants' experiences and questions are

used to present diabetes content and discuss psychosocial, coping and other issues identified by the group.

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 (Appendix 2) can be discussed. The session provides participants with an opportunity to share their progress in achieving their target goals and discuss any challenges and successes they have had with making long term health behaviour changes. It is also an opportunity to revise the key messages and to re-check biochemical and lifestyle measurements.

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 how to overcome obstacles by planning ahead and foreseeing problem areas.

A programme delivered in this way has distinct advantages. Some of which are:
- The local venue acts as a reminder for the participant of their diabetes management on a daily basis.
- The venue is readily accessible to the target audience.
- Facilitates the integration of participants experience into the curriculum.
- Participants set up a local group or network because of the shared experience.
- Education is service user focused rather than provider user focused.
- Programme is user specific, tailored/adapted to specific user needs.
- Information is given in response to questions, therefore is viewed as desired information and focused to meet personal needs.
- Goals are self selected and therefore eliminates compliance and adherence concepts.
- Intrinsic motivation is evoked rather than relying on extrinsic motivation such as advice.
- Education is viewed as helpful in dealing with the reality of living with diabetes.

Educational programmes have greatest health impact when they have a flexible approach to both delivery (place) and content (tailored to meet users' needs)[25].

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[25] Foster M, Kendall E., Dickson P., Chaboyer W., Hunter B. & Gee, T. (2003) Participation and chronic disease self-management; are we risking inequitable resource allocation? *Australian Journal Primary Health.* **9,** 132-140.

3.0 Evaluation

This evaluation is based on the initial enrolment in the course and the 26 week follow up. The evaluation was not a "true experiment" in that participants were not randomly chosen and there was no control group. However, participants may be representative of the person with diabetes who self nominate to attend diabetes education at community level. The purpose of this evaluation is to critique CODET2 as part of the process of improving the programme to meet the educational needs of people with diabetes.

Approval for the contents of the programme and evaluation procedures was sought and received from the Professional Services Committee of the Diabetes Federation of Ireland.

Participants were requested to complete pre-tests/post-tests to participate in the programme and only one declined. Some had difficulty with the number of questions asked and those people were assisted/advised to complete as much as possible.

Evaluation is pre and post the programme i.e. before first session, after fourth session (week seven from session 1) and 26 weeks after attendance at the first session (see table 1). Evaluation is both process orientated and participant orientated:

Process orientated

- ➢ Biomedical
    - A1c - at baseline and six months
    - Cholesterol - at baseline and six months
    - Weight loss, based on weight at week 1, week 7 (if desired) week 26
    - Blood pressure, based on reading at week 1, week 7 and week 26

- ➤ Lifestyle
  - Dietary intake (Modified version of Dobson's 17-item short fat questionnaire) and physical activity level (Godin's leisure-time exercise questionnaire) at baseline and week 26.

- ➤ Knowledge
  - Negative marked dichotomous 20 item statements about diabetes - the Diabetes Knowledge Questionnaire - at week 1 and week 7.

Participant oriented – psychological

- ➤ Qualitative review through in-depth interview to examine the satisfaction of attending this type of programme.

- ➤ 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 (measured using the Diabetes Empowerment Scale- SF).

- ➤ In addition, 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 practices from which participants were recruited.

After consent procedures, participations were asked to complete a booklet of questionnaires including demographic data, duration of diabetes, current medications, diabetes empowerment scale, food intake report and physical activity records. Participants having difficulty with visual aspects of the booklet were assisted by a Federation staff member reading the question. Participants with difficulty answering the questions were allowed to discontinue.

Table 1   Evaluation Procedures

Evaluation	Measurement	Instrument	Time
Biomedical markers	A1c Cholesterol Weight Blood Pressure	Result fromm GP Cholestech LDX Tanita Scales Monitor	at week 1 and week 26 at week 1 and week 26 at weeks 1, 7 and 26 at weeks 1, 7 and 26
Lifestyle	Dietary Fat Intake Physical Exercise	Dobson's SFQ Godin.s Leisure-time Questionnaire	at week 1 and week 26 at week 1 and week 26
Knowledge	Diabetes Related Knowledge	Knowledge Questionnaire	at week 1 and week 7
Self-efficacy	Diabetes Related empowerment	Anderson's DES-SF	at week 1 and week 26

3.1 Instruments

Demographic details including duration of diabetes and current medications were collected for each participant.

At baseline, cholesterol levels were measured using a Cholestech LDX, but where this was not possible, recent results were collected from the GP. The A1c was measured by the GP unless the most recent result was within one month of the start of the programme (this was not possible in all practices). The body weight of each participant was measured with a Tanita Electronic Scale and the height using a Leicester Height Measure. Body mass index (BMI) was calculated as weight (kg)/height (m)^2.

3.1.1 Dobson's Short Fat Questionnaire

Lifestyle measures collected data to identify any change in behaviour during participation in the programme. Dietary intake focused on the selection of lower fat foods and the frequency of consuming high fat foods to determine if participants altered their food choices as a result of attending the programme. Depending on the participants' usual eating habits and weight at entry to programme, dietary intake may or may not have to be changed/reduced. However, good diabetes management requires adherence to a low saturated fat intake. It is for this reason that the dietary intake questionnaire focused on general habitual choice of low saturated fat foods. The Short Fat Questionnaire (SFQ)[26] is a 17-item questionnaire with five possible responses to fourteen of the items indicating the frequency of consumption of higher fat content foods. For example, how often do you eat fried food with a batter or breadcrumb coating? Responses range from six or more times a week to never. Total range of scores range from 0 to 63. A score of twenty or below is estimated to be equivalent to 20% total fat and 7% saturated fat consumption. The modification necessary for use in an Irish setting was removing the word "devon" in item 6, changing the word "camembert" to "philadelphia" in item 14 and altering item 15 to read – When buying/using milk do you buy/use? Condensed, cream, fullfat or regular milk, low fat milk, slimline milk or do not use milk. The modifications were determined through cognitive interviewing of people with diabetes attending AMCH as part of a PhD study.

3.1.2 Godin Leisure-time Exercise Questionnaire

Physical activity was measured by the Godin Leisure-time Exercise Questionnaire[27] which comprises of four items and measures the frequency and intensity of normal leisure time exercise behaviour. Subjects are required to indicate how many times per week they engage in mild, moderate or strenuous exercise for more than 15 minutes during their free time in a typical week. A total

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[26] Dobson, A. J., Blijlevens, R., Alexander, H. M., Croce, N., Heller, R. F.&Higginbotham, N.
(1993) Short fat questionnaire: a self-administrated measure of fat -intake behaviour. *Australian Journal of Advanced Nursing*, (17), 144-149.
[27] Godin G Shephard RJ. A simple method to assess exercise behavior in the community. Can J Applied Sport Sciences. 1985; 10: 141-146.

score in arbitrary units can be derived by summing reported weekly frequency of participation at each of the three intensity levels multiplied by the corresponding weighted value. The weighted value is based on the estimated metabolic equivalents (MET) value which is 3 for mild exercise (e.g. walking), 5 for moderate exercise (e.g. fast walking) and 9 for strenuous exercise (e.g. running). This instrument was used in previous Irish Studies including SLAN (1999) and SPHERE (2005) which may allow comparison of other groups to the study participants.

3.1.3 Diabetes Knowledge Quiz

The knowledge quiz, consisting of 20 statements, tests diabetes knowledge and understanding, for example, what effect does unsweetened fruit juice have on blood glucose? Possible responses for this question are no effect or raise blood glucose. The quiz was developed by a multidisciplinary group with a combined 70 year expertise in diabetes care (Professional Services Committee, Diabetes Federation of Ireland). The quiz was originally validated on a group of counsellors undertaking a diabetes module and more recently on a group of nurses, dietitians and doctors attending a diabetes professional study day.

3.1.4 Diabetes Empowerment Scale

The psychological effects of attendance at the programme were assessed by the short form Diabetes Empowerment Scale (DES-SF). This instrument gives a brief overall assessment of diabetes related psychosocial self-efficacy[28] by assessing the management of psychosocial aspects of diabetes, dissatisfaction, readiness to change and setting and achieving goals. The DES-SF comprises 8 items and assess 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. The DES-SF was created by Anderson et al by choosing the item from 28 items of the

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[28] Anderson R.M., Fitzgerald J.T. et al. (2003) The Diabetes Empowerment Scale–Short Form (DES-SF) (Letter). *Diabetes Care* 26:1641–1642

Diabetes Empowerment Scale with highest item to subscale correlation from each of the eight conceptual domains. The reliability of the DES-SF on 229 people with diabetes was $\alpha = 0.84$. The content validity of the DES-SF was supported in the same study by the fact that both DES-SF scores and HbA_{1c} levels changed in a positive direction after the 229 subjects completed a 6-week problem-based patient education program

3.2 Data Collection

As part of their induction into the programme, each participant had the following baseline measurements taken by the programme facilitator:

- Demographic details
- Current diabetes management activities
- Record of prescribed medications
- Weight
- Height
- Body Mass index
- Waist circumference
- Blood pressure
- Blood cholesterol and glucose level.
- Self reported dietary intake and physical activity levels
- Diabetes empowerment scores
- Knowledge of understanding living with diabetes scores

A1c levels were collected from the GP on as many participants as possible.

At week 7, participants were invited to be weighed, have their waist circumference measured, have their blood pressure recorded and to complete the Diabetes Knowledge Quiz.

At week 26, all participants had all measurements repeated except for knowledge.
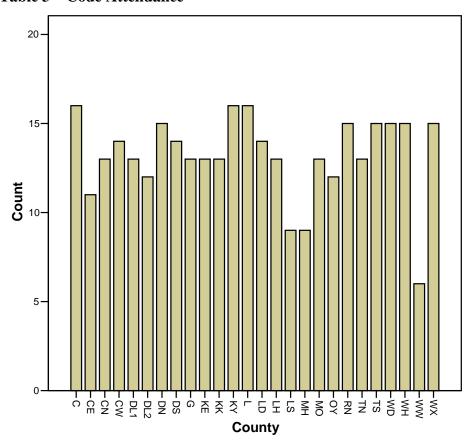
4.0 Results

During 2007, 347 people attended CODET2. There is a proportional distribution of attendance all over Ireland (Table 2).

Table 2   Code Attendance in each HSE region.

HSE Region	Number of participants		Number of programmes
MidLeinister Region	85	(24%)	7
NorthEast Region	50	(15 %)	4
Southern Region	104	(30 %)	7
Western Region	108	(31 %)	8
Total	347	(100 %)	26

The number of participants varied in each course which was partly influenced by attendance of carers as the total number of participants including carers per course was limited to 16.

Table 3   Code Attendance

The attendance of people with diabetes was 13-16 participants per programme except for two programmes Wicklow (6) and Kildare (9). Both those programmes

were evening programmes at the request of the local GPs to facilitate working participants.

4.1 Demographic Results

Equal numbers of men and women participated and the sample were predominately older than 50 years of age (Table 4). Age ranged from 30 years to 85 years with an average age of 64 years. Two thirds (226, 66%) of the participants were taking medications to control their diabetes.

Table 4   Characteristics of participants.

Characteristic	n	% of sample
Gender		
Male	179	52%
Female	168	48%
Age group		
30-39	7	2%
40-49	21	6%
50-59	66	20%
60-69	117	34%
70 +	103	30%
Not stated	27	8%
Diabetes treatment		
Diet and Exercise	59	17%
+ medication	226	66%
Not Known	58	17%
Source of diabetes care		
Hospital	164	47%
G.P	19	6%
None	140	41%
Not answered	20	6%

The GP had been requested to invite people with diabetes who did not have access to diabetes education elsewhere. However, of the 303 who stated where they received their diabetes care, 164 (54%) attended hospital based diabetes care, 19 (6%) stated they received care from their G.P and 120 (40%) reported not attending anywhere regularly for diabetes care. There was no relationship between area of the country and source of receiving diabetes care. However, older

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people were more likely to be attending their GP only for diabetes care or not receiving regular diabetes care but this did not reach statistical significance.

4.2 Medication use

Nearly all participants took a number of medications besides their diabetes medications: anticoagulants (80%), antihypertensive treatment (62%) cholesterol lowering medications (80%) except for people less than 50 years of age who were typically on diabetes medication alone.

4.3 Diabetes Complications

Over half (52%) of all participants reported having diabetes complications which often related to the heart or eyes. Of the 173 people who reported having other medical problems, the most commonly reported were cardiac related (41, 13%), hypertension (51, 15%) with only 10 (3%) reporting raised cholesterol. However, people were asked only to name the most serious and may have had more than one other medical condition.

4.4 Duration of diabetes

The length of time participants had diabetes varied from newly diagnosed to 35 years (mean 6.2 years, SD = 6.4 n=300).

4.5 Smoking Behaviour

Only 32 people reported smoking which was not related to age or gender.

4.6 Blood Pressure

Of the people who had their blood pressure recorded (n=188), almost three quarters (72%) had readings above the recommended 130 systolic (range 109-209 mmHg/dl) and almost one third (30%) had diastolic readings above the recommended 85mmHg/dl (Range 48-138). No significant association was found between attaining BP targets and taking antihypertensive medication (Table 5).

Table 5   Blood Pressure Readings at Week 1.

			Number on Antihypertensives		Total
			No	Yes	
Hypertension As defined by Systolic BP>135 Or Diastolic BP>85	Normal BP reading		21	23	44
	High Systolic Reading		53	94	147
	High Diastolic Reading		30	48	78
Total			104	165	269

4.7 Body Mass Index

Almost all people (n=317) had their weight and height measured with only 6% (18) attaining a weight appropriate for their height with an almost similar number (28, 8%) having a body mass index (BMI) greater than 40 (Table 6). People who did not have their BMI recorded were late for, missed the first session or declined to have their measurement recorded. Women were typically heavier (p<0.05) and this was most significant in the 50-60 year age group (p<0.005).

Table 6   **Body Mass Index**

		Gender		Total
		Female	Male	
Average Body Mass Index		32.67 (SD 6.43)	30.59 (SD 4.19)	31.66 (SD 5.61)
Body Mass Index Range	18-24.9	11	7	18
	25-29.9	48	71	119
	30-34.9	45	56	101
	35-39.9	30	20	50
	40-44.9	16	5	21
	>45	6	1	7
Total		155	161	316

4.8 Weight Loss

At session 4, seven weeks from start of the programme, 66% of the participants agreed to be reweighed, of these 64% had lost weight averaging just over1 kg each (mean 1.3 kgs, SD=1.49).

115 participants have completed the programme and had their weight rechecked at week 26. A paired-samples t-test was conducted to evaluate the impact of the programme on the body weight. There was a decrease in post scores from pre (mean = 84.5kgs, SD = 15.9) to post (mean = 83.9 kgs, SD= 15.5), t (114) = 2.25 indicating significant result (Cohen's d= 0.038, r=0.02).

4.9 Waist circumference

For women, the average waist circumference at the start of the programme was 101 cms (range 67-142cms, n=149). Only 21 women had waist circumference measurements below 88 cms, only 16 below 85 cms and only 3 below the recommended 80 cms. For men, the average waist circumference was slightly larger at 105 cms (range 78.5-136 cms, n=149) but a greater proportion (17%) had waist circumference measurements below the recommended 94 cms.

4.10 A1c

Half of the participants who had an A1c recorded (n=165) had a reading of less than 7% indicating good control of their diabetes (Table 7). However, the remaining 52% of participants had readings up to 13% giving an overall mean A1c level of 7.4% (SD= 1.5, range 5.3-13.8%) for the group with visual inspection of the data showing higher levels (>10%) being more likely from men.

Table 7   Average A1c Levels at Week 1

Gender	Mean	Std. Deviation
Female	7.2	1.19
Male	7.5	1.67
Total	7.4	1.45

At week 26, it was only possible to get repeat A1c levels on 42 participants. These results are possibly from primary care practices with high GP diabetes interest. Nevertheless, results indicate that attendance at the programme resulted in the men's A1c values decreasing considerably to an average 6.5 %, (SD = 1.2. range 5-11.7%). A paired-samples t-test was conducted to evaluate the impact of the programme on the A1c levels. There was a decrease in post scores from pre (mean = 7.3, SD = 1.5) to post (mean = 6.9, SD= 1.15), t (41) = 1.73 with Cohen's d= 0.42 r= 0.12) indicating a small effect of the programme on A1c levels which must be regarded as clinically significant due to the timeframe of 26 weeks.

4.11 Total Serum Cholesterol

At the commencement of the programme, the majority of people (75%) had total serum cholesterol levels recorded that were less than the recommended 4.5mmol with men having lower total cholesterol results (Table 8).

Table 8 Total Cholesterol Results at Week 1

Gender	Mean	N	Std. Deviation
Female	4.2357	154	.97365
Male	3.8252	163	.88182
Total	4.0246	317	.94862

Women with cholesterol levels greater than 4.5mmols were more likely not to be on statins whereas men were more likely to be on them (Table 9).

Table 9   Relationship of Cholesterol Results, Gender and Prescribed Cholesterol Medication.

On Cholesterol Medications				Gender		Total
				Female	Male	
No	Cholesterol	<4.5		32 (52%	39 (83%)	71
		>4.5		30 (48%)	8 (17%)	38
			Total	62	47	109
Yes	Cholesterol	<4.5		61 (85%)	70 (84%)	131
		>4.5		11(15%)	13 (16%)	24
			Total	72	83	155

HDL levels ranged from 0.39mmols to 2.70 mmols with an average of 1.1mmol/l (SD= 0.37, n=187). Nearly half (49 %) had a HDL level of less than the recommended 1.0 mmol/l for men and 1.2 mmol/l for women. The Yates correction for continuity (χ^2=7.76, p<0.05) showed this to be statistically significant for gender but not for age. There was no relationship between being on cholesterol medication and a lower than recommended HDL level; however, the type of cholesterol medication prescribed was not recorded.

The majority of people (75%) had an LDL cholesterol reading below the recommended 2.5 mmol/l. People who smoked (n=16) were more likely to have a raised LDL level (Yates Correction for continuity = 3.78, p<0.05).

The recordings of triglyceride ranged from 0.41 mmol/l to above the range recorded by the Cholestech LX (7.34mmol/ls) for 2 participants (mean 2.08, SD= 1.19), with one third of the readings (32%) being above the recommended level of less than 2.3mmols. A recording above the recommended level was not found to be related to gender or taking cholesterol medications.

A paired-samples t-test was conducted to evaluate the impact of the programme on the total cholesterol levels. There was a decrease in post scores from pre (mean = 3.90, SD =0 .87) to post (mean = 3.83, SD= 0.89), t (126) = 1.35 with Cohen's d = 0.79, r=0.04 indicating a small effect size[29] which is clinically significant given the baseline mean cholesterol level of 4.02 mmol/l.

At week 26, there was no change in LDL levels (Table 10)

Table 10   Comparison of LDL at week 1 to LDL week 26

	Mean	N	Std. Deviation	Std. Error Mean
LDL W1	1.93	109	.766	.073
LDL W26	1.94	109	.750	.071

Similarly, there was minimal change in the triglyderide levels at week 26 which was significant. There was a decrease in post scores from pre (mean = 2.07, SD =1.10) to post (mean =1.99, SD= 1.03), t (123) = 0.8.

4.12 Food intake

A food index score of less than 20 reported by 66% of participants signified an intake of saturated fat food products in line with European recommendations for frequency without indication on quantity or consumption of processed foods other than meats and pies. The overall mean score was 17.39 (SD = 6.97, range 3-42).

There appeared to be a small relationship between reported fat intake and body mass index (Table 11).

Table 11   Relationship of Reported Fat Intake, Body Mass Index and Gender

Gender	Low Fat Intake i.e habitual consumption of less than 20% fat	Obese BMI>30		Total
		No (% of total)	Yes(% of total)	
Female	Low Fat Intake	21 (39%)	34 (39%)	55
	Higher than recommended fat intake	33 (62%)	54(61%)	87
	Total	54	88	142
Male	Low Fat Intake	26 (40%)	28 39%)	54
	Higher than recommended fat intake	39 (60%)	48(63%)	87
	Total	65	76	141

At week 26, participants who completed the food intake questionnaire reported a reduction in the frequency of eating saturated fats (Table 12)

Table 12   Self-reported Fat Intake (score of less than 20 indicates adherence to recommended low saturated intake).

	Mean	Std. Deviation	Std. Error Mean
Fat intake pre attendance	16.72	6.146	.615
Fat intake post attendance	15.15	6.188	.619

However, given the low scores at the commencement of the programme, the issues of self- report must be considered.

4.13 Exercise

Participants were asked to report on the type and frequency of leisure activity and exercise at 3 different levels of intensity – strenuous, moderate and mild. Participants reported on each type they undertook.

Prior to the programme, only a few people (7%) reported taking regular strenuous exercise varying from daily to once weekly, a third took moderate exercise with half reporting taking mild exercise (minimal effort). Almost half (49%) reported taking no regular exercise, which was not related to gender, age or other illnesses. Participants were also asked if during the course of a typical week, they engaged in any activity long enough to work up a sweat (heart beats rapidly). Only 10%

said they did so regularly, 14% sometimes but over half (54%) said they rarely or never did.

At week 26, the number of people reporting taking all types of exercise had increased. A paired samples t-test was conducted to evaluate if this was a significant outcome of attendance at the programme (Table 13). Although there was an increase in all levels of activity, the most significant was for strenuous exercise with a significant increase in post scores from pre (mean = 0.49, SD = 1.29) to post (mean =1.8, SD=3), t (38) = 2.64 with Cohen's d = 0.56, r=0.27.

Table 13   Paired Statistics for Different Levels of Intensity of Exercise Reported (1 is indicative of 15 minutes of activity)

		Mean	Std. Deviation	Std. Error Mean
Strenuous exercise times per week	Week 1	.487	1.295	.2074
	Week 26	1.795	3.002	.4807
Moderate exercise times per week	Week 1	2.522	2.779	.4097
	Week 26	3.565	2.746	.4049
Mild exercise times per week	Week 1	4.000	4.598	.7012
	Week 26	5.293	6.307	.9731

Therefore, it may be concluded that at week 26, there was an increase in the amount of exercise people reported taking.

4.14 Knowledge

Almost all participants completed the knowledge quiz at baseline and scored an average of 6 (Mean = 6.4, SD= 3.9, median = 6, range - 4 to 18). Only 3% of people (10) had a score greater than 12 which indicates a good understanding of diabetes.   There was no relationship between score and gender, duration of diabetes, treatment or BMI group. A negative baseline score indicated that the participant believed they knew the true answer to the questions and were incorrect twice as often as correct. A pairwise students was conducted to evaluate the effect of the programme on knowledge with an increase in prescores (mean = 6.4, SD= 3.9t-test) to post (mean = 8.4, SD= 4.6) t (165)= minus 5.8, Cohen's d = -0.46, r=

0.22 which indicated a significant increase in knowledge scores pre and post attendance at the programme with over a third of participants (34%) scoring greater than 10 after attendance.

4.15 Empowerment

The diabetes empowerment scales were completed correctly at both time points by 153 participants with a mean score of 30.6 (S.D= 5.0, range 12-40), indicating that the participants had moderate levels of psychological diabetes self-efficacy at the start of the programme.

At week 26, the mean score of participants had increased to 33. 3 (SD=3.09, range 25-40) with the lowering scoring participants at commencement gaining more from the programme.

Table 14 Paired sample test for empowerment (Increasing scores = more empowered)

In general I believe that	Mean Week 1	Mean Week 26	Sig
I know what part of my diabetes I am dissatisfied with	3.91 (SD= .73)	4.0 (SD= .81)	.68
I am able to turn my diabetes goals into a working plan	3.98 (SD= .93)	4.20 (SD= .63)	.42
I can try out different ways of overcoming barriers to my diabetes goals	3.88 (SD= .95)	4.16 (SD= .77)	.39
I can find ways to feel better about having diabetes	4.09(SD= .72)	4.22 (SD= .73)	.11
I know the positive ways I cope with diabetes related stress	3.73 (SD= .96)	4.15 (SD= .64)	.008*
I can ask for support for having and caring for my diabetes when I need it	4.09 (SD=.91)	4.31 (SD= .57)	.17
I know what helps me to stay motivated to care for my diabetes	3.76 (SD= 1.05)	4.17 (SD= .62)	.049*
I know enough about myself as a person to make diabetes care choices that are right for me	4.11 (SD= .81)	4.31 (SD= .56)	.035*
Total Score	30.60 (SD= 5.0)	33.9 (SD=3.3)	0.004*

*denotes significant finding.

The eight domains of the DES-SF are assessing 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. The increase in empowerment was significant for coping self-efficacy, motivation and making diabetes care choices appropriate for oneself (Table 14).

4.16 Participant Views

In addition, at the seven week stage, participants were asked to review their experiences of attending the programme.   Some of the comments were

M: 'We never got anything like this in the hospital; I look forward to our meeting'.

J: 'Now I am much better able to limit how much I eat… I feel more motivated'

P: 'I feel great.. I am walking a lot more than before'

W: 'I was always following a healthy diet but now I understand better why I need to'

J: 'Diabetes is all new to me…. This group is a great help… everyone understands.

D: 'I watch how much I eat now and I have lost weight'

M: 'I haven't changed anything … but I've learnt a lot'

G: 'I walk everyday now… I feel fitter and healthier than before'

A: 'I was worried about my diabetes but I know what to do now'

M: 'I'm picking less… I don't have the cravings as much because now I don't have the wrong things in the house'

D: 'I knew nothing about diabetes…. I understand a lot more now'

C: 'The course was really interesting …. We wouldn't have come back if we weren't enjoying it'

T: 'I know what to do now if I am sick'

M: 'I didn't know what a low sugar was –and I was having lots of them… now I understand'

A: 'I go for a walk now some days.. I never did anything before'

Any negatives were local administration issues, such as timing, parking and facilities (community centres were utilised where possible and in some cases, toilets, chairs etc were not of an appropriate standard).

The programmes to date have been held in primary care practices, health centres, parish or community buildings and hotels. All of the participants welcomed the opportunity to come together and chat about their diabetes in an informal manner.

4.16.1 General feedback

Awareness of the programme is increasing rapidly. Primary care practices in areas where we have already commenced courses who have heard about the course are contacting us asking when it will be available to them. In addition, community healthcare professionals have asked to sit in on the course as a means of increasing their diabetes knowledge and gaining insight into living with diabetes.

A General Practitioner in Waterford whose patients have the programme said

"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. From my own perspective, the Federation looked after every aspect of the organisation and delivery. It has been hugely beneficial and should be on-going. The continuity and ongoing monitoring is of the utmost importance. The enthusiasm among my patients is such that I have a full waiting list for another programme".

The Federation also has a waiting list of patients in other areas for future courses. Ten people who had not pre- registered for the Limerick programme turned up on the first day of the programme. They are now on a waiting list for the next programme in Limerick.

An interesting development is the request from practice nurses to train to deliver the course and from diabetes secondary care centres asking for the course to be delivered through their centres.

4.16.2 Complimentary Regionalisation Diabetes Services

In close proximity to each CODE T2 programme, the Federation organised local public education meetings (24). Awareness of diabetes was raised through the media (radio adverts for public meetings and/or interviews on diabetes to an audience of 2,337,924[29] listeners). In addition, a further 1,000,000[29] people were targeted with information through the local and National press (the Irish Independent June 28th distributed 160,818 supplements devoted solely to diabetes). Community site visits were utilised to raise diabetes awareness and identify people at higher risk of developing type 2 diabetes. People at increased risk of having undiagnosed diabetes were offered diabetes screening (2473 people). All people are informed of their relative risk of developing diabetes and offered appropriate lifestyle counselling to reduce the risk of future ill health, in particular, type 2 diabetes, cardiovascular disease and lifestyle related cancers.

In addition there were 26 visits to workplaces during 2007. 687 people were assessed and screened for lifestyle behaviours that may be putting them at risk of future ill health. 32 (4.65%) were found to have raised blood glucose, 148 (21.5%) had raised blood pressure, 54 (7.8%) had raised BMI. Finland has used a similar population based health strategy with excellent reported results[30].

All RDOs have undertaken training on the Berger programme (CHO counting), the programme on which structured patient education is based upon. This is to facilitate a CODE for Type 1 diabetes - both for persons with Type 1 diabetes and parents of children with Type 1 diabetes. Four CODE Type 1 public education meetings (Dublin, Portlaoise, Galway and Clonmel) were also held in 2007 with very good attendance and all present found the meetings informative and

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[29] Diabetes Federation of Ireland Annual General Meeting, Dublin November 11th 2007.
[30] Tuomilehto J. (2007) Fin-D2D Meeting, International Reporting Days, Tampere Finland, June 3-6 2007.

supportive. Previous experience has shown that although parents of young children attend public meetings, they require a format for open discussion in small groups. This is best achieved in an informal workshop format facilitated by a professional with a maximum of 16 participants. CODE for parents has taken place in Limerick facilitated by the Federation and Mid Western Regional diabetes centre staff and Cork facilitated by the local Federation Parents Support Group and Cork University Hospital diabetes centre staff.

4.17 Costs

The average cost of delivering CODE programme in the current format (5 sessions) is in the region of €5,000 per programme. This cost includes the cost of hiring accommodation when necessary, travel expenses and manpower including statistical support. It does not include the population based strategy aimed at raising community diabetes awareness that compliments each CODE programme.

The travel cost involved with delivering CODET2 are considerable and it may be more prudent to employ additional staff who could be based distant to the current bases of Galway, Cork, Wexford and Dublin. For example, any programme delivered in Donegal requires a manpower day for travel and over 200 kms travel each session. Employing a healthcare professional in Donegal and surrounding counties may be a more cost effective use of resources and also benefit the local population of people with diabetes.

In the interim, CODE programmes that require considerable travel will be clustered to locations of close proximity to reduce travel expenses.

5.0 Discussion

In this day of evidenced-based practice, all professionals must gather the evidence to support their practices and modify their interventions in response to the evidence. CODE was developed on an action research basis to facilitate the alteration to the education programme in response to initial evaluation. The results of this study suggest that CODE is very well received by people with diabetes and their professional carers. Delivering CODE at community level has some special advantages. It allows the facilitator to have a direct experience of the community where the participants are caring for their diabetes and allows them to tailor the education to the reality of the participant's environment which is in keeping with the HSE transformation agenda. Also, 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.

The outcome measures of CODET2 at seven weeks indicate that people with diabetes understand their condition better as a result of participating and over half of the participants have made behaviour changes that have impacted on their overall health. At week 26, behaviour change had resulted in positive trends in weight loss, reduction in cholesterol and waist circumference reduction and although these did not reach statistical significance provides evidence of behaviour change by individuals through attendance at the programme. However, more importantly there was a significant increase in participants knowledge scores, coping ability, motivation to change and making informed decisions about their diabetes.

The aim of CODE is to enhance each individual's ability to self-manage their diabetes and advancing the participants understanding of good diabetes management and the beneficial effects of adopting personal behaviours on medical outcomes. A central purpose of CODE is to help people with diabetes make informed decisions and to facilitate their self-management behaviours. However, there are several more immediate objectives that contribute to the behaviour change. These are the development of self-management knowledge and

skills to achieve behaviour change and in turn enhance well being. Understanding the need for behaviour change may be the first obstacle that many people with diabetes must pass. The knowledge quiz used in this study was developed to aid understanding of the basic concepts of diabetes management e.g. the effect of natural sugars when eaten and not knowledge specific to the programme. The significant increase in knowledge scores from baseline to seven weeks although modest, show that people attending the course gained a better understanding of how to and why it is necessary to manage diabetes.

The evaluation at baseline provides a picture of patients with diabetes that attend the primary care centres who agreed to take part in CODE. It may be argued that the participants of CODE are more likely to be motivated and therefore amenable to this type of intervention. However, it is our experience that the participants came at the personal request of the G.P and therefore are representative of the target group. Indeed, the fact that 40% of course participants reported receiving no ongoing diabetes care, and yet were prepared to undertake a community-based course in diabetes disproves the suggestion that patient motivation alone determines access to regular diabetes care. The selection of GP was identified by local people with diabetes (Federation members) because the Federation members were aware of the objectives of CODE.

5.1 Lessons Learned

The results of this evaluation are being used to sharpen the focus of CODE (T2) programme but more importantly the results has identified the need to identify core short term outcomes of the programme that can be monitored. The instruments used to collect data for this evualtion focused on longer term behaviour change and resultant health outcomes. It may be more appropriate to take a step backwards and measure what is actually learned by the participants rather than how it is implied because knowledge (consciousness-raising) is the first step in behaviour change. For example, facilitators of the course state that in response to questions on a healthy diet they initially used the food pyramid for demonstration. However, it very quickly became evident that they first needed to

assist many participants in identifying what proteins, fats and carbohydrates were and their uses in the body. Many participants had difficulty in relating sugars to carbohydrates and were not aware that sugar came from different sources or that some sugars were better than others.

Initially, it was anticipated that a core component to include in evaluation was empowerment and self-efficacy. However, one of the core assumptions in empowerment is that all people are ready to be empowered. The majority of CODE (T2) participants are older and firmly believe that their medical doctor knows best – many of the participants attended because their doctor said they should. It may be more apt to identify where participants stand in relation to having the motivation and willingness to be empowered. Therefore, the focus may be more appropriately placed assessing patients' preferences for information giving and preventing information overload and subsequent patient distress. It is only through transformation of healthcare professionals and improved communication with their patients that the consumer view of their role in the management of their illness will be altered. Ideally, diabetes patient education should be integrated with routine care, and facilitated by those providing that care.

There were core problems with getting participants to complete the survey instruments. This may be due to lack of understanding and/or familiarity with completing surveys or there may be literacy issues. In addition, the instruments used which had poor item response rate were those with American expressions which may have caused confusion to the Irish population.

6.0 Recommendations

The 2007 results of CODE are very positive and have led to recommendations for its further development to meet the needs of people with diabetes. A criticism raised by participants was the length of time given to evaluation at baseline. It was viewed that this may actually take from the programme and was negatively impacting on participants. The initial measurements could take up to one hour, therefore, to reduce participant burden these are shortened for CODET2 2008.

- Where possible, blood results will be provided by the GP as a prerequisite to the programme but where this is not possible, people will be empowered to request their personal results.
- Practice nurses will be invited to take an active part in assisting the programme for their own professional benefit and to facilitate more sustained follow-up for participants.
- The instruments measuring behaviour will be incorporated into week 2 and 3 of the programme and will not form part of the evaluation data.
- A content specific knowledge questionnaire will be developed.
- The objectives of Week 7 are to reinforce the messages from previous sessions and to offer support to participants which will enable them to continue with long term health behaviour change. These could be adequately meet by a structured phone call and therefore will be altered to a telephone call for 2008.

Evaluation of the programme will continue. The primary intention of CODE is to address current inequalities in access to diabetes community services. To date, CODE is offered to GP practices who currently have limited access to community services.

CODE has developed from a needs assessment of approximately 100 people attending primary care diabetes services and evaluated on almost 350 people. Currently, it is the only structured diabetes education programme available in

Ireland for people with diabetes that addresses basic informational and psychological needs.

Some diabetes education programmes have gained credibility by research studies using a randomised control trial design. Despite this shortcoming, CODE is providing a service previously unavailable/limited to a significant number of people with diabetes. Therefore, ethically, all available resources should be utilised to extend the delivery of the service pending international research to establish the core benefits/outcomes against which different structured education programmes should be examined. Nevertheless, funding from a research foundation has been applied for to further research the outcomes of CODE. In addition, the CODE data is available in SPSS format to any researcher for further analysis on the understanding that any information gained will be utilised for the further development of CODE.

CODE will continue in its current format with changes as outlined above. Peer review and quality assurance of CODET2 will become the focus for 2008.

6.1 Further Development of CODE

In the long term, structured diabetes education for all people with diabetes is advocated by the Structured Diabetes Education Forum and the Diabetes Expert Advisory Group Empowerment sub-committee. In addition, the Transformation Programme 2007-2010 had identified that by 2010, people will be able to access care services through their local primary care team, i.e. conveniently and close to home. CODE is an example of an ideal project to fulfil both recommendations which could be developed to provide education to all people with diabetes who have not accessed formal diabetes education programmes. To do so, requires that the programme be delivered by people with expertise in diabetes management and ideally have a qualification in core facilitating skills.

The Federation RDO's are ideally placed to support practice nurses who have undertaken a diabetes course to deliver structured diabetes education programmes.

In addition, they have already advanced facilitation qualifications and are suitably qualified to train practice nurses in basic facilitation skills, motivational interviewing and goal setting. It is proposed that funding should be sought to deliver regional skills courses to practice nurses who already have a diabetes education qualification with a view to having these practice nurses deliver CODE (T2).

7.0 Conclusion

In summary, CODE(T2) has been well received by participants, and professionals of the practices which held the programme. The results for the 2007 CODET2 programmes completed show that people who attended the programmes found them worthwhile and substantially increased their knowledge about diabetes and how to control it. As with other structured education programmes, it is clear that additional healthcare interventions results in improved patient outcomes. Many of the participants had lost weight and had improved diabetes control and increased physical activity. The programme has demonstrated, at a reasonable cost, the effectiveness of community education in raising awareness of diabetes. In the long term, CODE should be developed and delivered alongside other structured education programmes such as DESMOND, X-PERT etc. This evaluation has established that CODE is responsive to local needs, can be delivered in local settings, is well accepted by patients and primary care professionals and assists people with diabetes to cope with their illness and empowers them to make informed choices about their diabetes.

Appendix 1   CODET2 Curriculum

Session One: Understanding Diabetes

Overview

This session will provide participants with an opportunity to share their experience of diabetes discuss their expectations of the course and identify their own role and responsibility in managing their diabetes. This session will provide general back ground information on diabetes and diabetes care. Participants will be able to identify the type of diabetes they have, discuss how it is managed and identify their role in the self-management of the condition.

Goal
The goal of session one is to facilitate a relaxed informal atmosphere, where participants can share, learn and understand their diabetes and identify their own needs.

Objectives

At the end of session 1 the facilitator should:
- Create an atmosphere which promotes group support and encourages active learning
- Gain an understanding of the level of knowledge among the group
- Provide basic knowledge on diabetes appropriate to the level of the group.
- Provide an opportunity for participants to explore individual self-efficacy in diabetes self-management

At the end of session 1 participants should have gained some understanding of:

- The different types of diabetes
- The risk factors for developing diabetes
- The signs and symptoms of diabetes
- The routes to diagnosis
- The importance of good glycaemic control and the target for A1c
- The reason for cholesterol, blood pressure, waist circumference and BMI monitoring
- Introduction to the risk of diabetes complications cardiovascular disease risk

During session 1 participants should also have an opportunity to consider:
- Their feelings and emotions around diabetes
- Their hopes and expectations for the course
- Their own goals for lifestyle change

Teaching Strategies
Interactive session, group work, discussion, brain storming

Suggested Time 2 hours

Session Two: Understanding healthy eating for diabetes

Overview

This session will provide participants with the opportunity to discuss diet in diabetes, managing weight and general day to day management of food with diabetes. This session aims to provide general healthy eating advice and recommendations for Type 2 diabetes and focus. Participants will be able to identify their role in self management around food and how it affects glycaemic control.

Goal

The goal of session 2 is to build on existing knowledge of healthy eating for Diabetes and correct any misconceptions. It will enable the participant to take a lead role on the management of their diabetes and understand the importance of a healthy weight to reduce overall complications risk.

Objectives

At the end of session 2 the facilitator should:
- Create an atmosphere which promotes group support and active learning
- Enable the participants to identify healthy eating recommendations for Type 2 diabetes
- Provide an opportunity to explore individual dietary changes and set target goals

At the end of session 2 participants should have gained some understanding of:

- The role of healthy eating in the management of their diabetes
- Identification of the major food groups
- What carbohydrates are and the effect on blood glucose levels
- The food pyramid and serving size
- The importance of being a healthy weight for risk reduction
- Dietary recommendations around fibre/fat/salt and alcohol

During session 2 participants should also have an opportunity to consider:

- Their feelings and emotions around food and weight
- Their own goals for change around food intake
- Their own serving sizes

Teaching Strategies
Small Group work, task with food pyramid, virtual shopping using food packaging and real foods.

Suggested Time 2 hours

Session Three: Self Management and your Diabetes

> **Overview**
> This session will highlight the need for early detection of problems and how to
> address them. It will also focus on the importance of regular screening and will
> clarify any outstanding issues and look at physical activity as an important lifestyle intervention.

> **Goal**
> The goal of this session is to empower the participant to take the lead role in the management of their diabetes and understand the importance of regular screening and reviews.

> **Objectives**
> **At the end of session 3 the facilitator should:**
> - Create an atmosphere which promotes sharing and discussion
> - Enable the participants to identify risks and appropriate action
> - Assess what areas participants need revising for the last session
>
> **At the end of session 3 participants should have gained some understanding of:**
>
> - The role of physical activity
> - Importance of not smoking
> - Hypoglycaemia and Hyperglycaemia
> - Management of sick days
> - Importance of good management of glucose, cholesterol and blood pressure
> - One's own role in the detection of problems, when and how to seek assistance
> - Complications of diabetes
> - Footcare
> - Importance of regular assessment and annual review
> - Entitlements/Employment/driving/insurance/travel/support
>
> **During session 3 participants should also have an opportunity to consider:**
> - Their own goals for lifestyle change

> **Teaching Strategies**
> Sharing of ideas and group support, teaching using pictures, diagrams
> Small group work, presentation using flip chart

Suggested Time – 2 hours

44

Session 4: Review and Post Course Screening
This takes place seven weeks after initial session

Overview
This session will provide participants with an opportunity to share their progress
so far and discuss any challenges and successes they have had with making long term
health behaviour changes. It is also an opportunity to revise the key messages and to
re-check biochemical and lifestyle measurements.

Goal
The goal of session one is to reinforce the messages from previous sessions and to
offer support to participants which will enable them to continue with long term
health behaviour change.

Objectives
At the end of session 4 the facilitator should:
- Ensure that all key areas of diabetes management i.e. healthy eating, physical activity, blood glucose monitoring, annual review are covered
- Provide an opportunity for participants to have their weight, BMI, waist circumference and blood pressure readings re-checked
- Discuss challenges faced and support participants to make realistic, achievable goals

At the end of session 4 participants should:

- Be aware of their current weight, blood pressure and waist circumference as compared with the beginning of the programme and the significance of any changes
- Know what risk factors they themselves have and how they are managing these
- Know the relevance of BMI, waist circumference and blood pressure as it relates to diabetes and cardiovascular disease
- Know what they can do to prevent and manage the complications of diabetes

During session 4 participants should also have an opportunity to consider:
- Their feelings and emotions around diabetes and how they compare to the beginning of the course
- Their success/failure in reaching their own goals and set new goals for long term lifestyle change

Teaching Strategies
Sharing of ideas and group support, teaching using pictures, diagrams
Small group work, presentation using flip chart

Suggested Time – 2.5 hours

45

Session 5: Review and Post Course Screening
This takes place six months after initial session

Overview
This final session will provide participants with an opportunity to share their progress so far and discuss any challenges and successes they have had with making long term health behaviour changes. It is also an opportunity to revise the key messages and to re-check biochemical and lifestyle measurements.

Goal
The goal of session one is to reinforce the messages from previous sessions and to offer support to participants which will enable them to continue with long term health behaviour change.

Objectives
At the end of session 5 the facilitator should:
- Revise the key areas of diabetes management i.e. healthy eating, physical activity, blood glucose monitoring, annual review
- Provide an opportunity for participants to have their weight, BMI, waist circumference and blood pressure readings re-checked
- Discuss challenges faced and support long term goals

At the end of session 5 participants should:

- Be aware of their current weight, blood pressure and waist circumference as compared with the beginning of the programme
- Know what risk factors they themselves have and how they are managing these
- Know their most recent A1c and it's significance
- Know the relevance of BMI, waist circumference and blood pressure as it relates to diabetes and cardiovascular disease
- Know what they can do to prevent and manage the complications of diabetes

During session 5 participants should also have an opportunity to consider:
- Their feelings and emotions around diabetes and how they compare to the beginning of the course
- Their own goals for long term lifestyle change

Teaching Strategies
Sharing of ideas and group support, teaching using pictures, diagrams
Small group work, presentation using flip chart

Suggested Time – 2.5 hours

CODET 2 DIABETES EDUCATION CHECKLIST

Venue _____ Start Date: _____

Information and Programme Setting	

1   <u>What is Diabetes?</u>

Definition & Risk Factors	
Types of and medical management	
Incidences of Diabetes	
Signs & Symptoms	
Feelings around Diabetes	
Short & long term Complications	
What is HbA1c, Chol, B/P?	
Cardiovascular Link	
Introduce Food Diary	

2   <u>Healthy Eating</u>

Use of Food Pyramid to explain the following

Fat, Carbohydrate, Protein	
Vitamins, Minerals, Fibre, Water	
Alcohol, Salt	
Regular Meals, Meal Planning	
Demonstrate Portion Sizes	
Methods of Cooking	

3   <u>Physical Activity</u>

Role in Physical Fitness	
Weight Reduction	
Plan Daily Physical Activity	
Effect on Blood Sugars	
Reduce Stress, Improve Wellbeing	
Goal Setting	

4   <u>Hypoglycaemia</u>

Definition & Causes	
Signs & Symptoms	
Prevention	

Contd overleaf

DIABETES EDUCATION CHECKLIST Contd

5   **Foot Care**

Foot care and Hygiene	
Examination of feet daily	
Recognition of when & how to seek help	

6   **Hyperglycaemia**

Definition & Causes	
Signs & Symptoms	
Care on sick days/ Flu vaccine	
Prevention	

7   **Oral Agents & Insulin**

Discuss as appropriate	

8   **Complications**

Explanation of Retinopathy, Nephropathy and Neuropathy	
Risk Factors & Symptoms	
Importance of keeping appointments	
Smoking	
Relevance of Blood Glucose, B/P, Chol in prevention & treatment of complications	

9   **Entitlements**

Insurance	
Long-term illness, Medical Card	
Support Facilities	

10   **Annual Review & Goal Setting**

HbA1c, B/P, Lipid Profile, Foot care, Eye care	
Weight, Microalbuminuria, Smoking	
Self Monitoring, Interpreting results	
Understanding their role in care	