

“Prevention in Practice: Diabetes.”

A pilot scheme to deliver a structured education programme to individuals with impaired glucose regulation

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Article points

1. A 6-month programme of structured health education and support was delivered to individuals with impaired glucose regulation with the overall aim of delaying or preventing progression to type 2 diabetes.
2. The programme was delivered by a multidisciplinary team to 24 participants, of whom 17 completed the programme.
3. Participants invited back 1 year after completion of the programme demonstrated reduced weight, waist measurement and fasting glucose levels and reported having a healthier lifestyle.

Key words

- Lifestyle
- Prevention
- Type 2 diabetes

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It is well established that the prevention of type 2 diabetes should be an integral role of the primary healthcare team (NICE, 2011). A pilot scheme was undertaken within a GP practice in Northenden, South Manchester under the heading of “Prevention in Practice: Diabetes”. The practice has a current diabetes prevalence of 5.4% within a predominantly Caucasian population. This scheme brought together various members of the primary healthcare team to deliver a 6-month programme of structured health education and support to individuals with impaired glucose regulation. The aim was to establish if this increased focus on lifestyle advice and diabetes awareness would have a positive impact on both physical and emotional well-being and if this could ultimately delay or prevent the progression to type 2 diabetes. This article describes the implementation and results of the education programme.

Although not all people with impaired glucose regulation progress to develop type 2 diabetes, it is widely established that they are at increased risk of doing so (Unwin et al 2002). Indeed, it has been suggested by Nathan et al (2007) that without intervention, many people with impaired glucose regulation will develop type 2 diabetes within a period of 5–10 years. In addition, this group of people are also at greater risk of cardiovascular disease and the complications associated with it (Sarwar et al, 2010).

The burden of type 2 diabetes – not only to the individual, but to the healthcare community too – is a heavy one. Diabetes UK, in its document “Key Statistics in Diabetes” (2010), highlighted at that time £286 was being spent every minute in the UK on diabetes-related healthcare costs. With the number of people with diabetes set to increase by around 3 million by 2025 (Diabetes UK, 2011), this serves to underline the increasing need to look at the prevention of type 2 diabetes.

Trials have shown that behavioural interventions can help to reduce the number of people with impaired glucose regulation who progress to type 2 diabetes. Gillies et al (2008) suggest that lifestyle interventions to facilitate improvement in diet and in increasing levels of activity can halve the number of people with impaired glucose regulation who go on to develop type 2 diabetes. The Finnish Diabetes Prevention Study (Tuomilehto et al, 2001) illustrated what relatively modest changes are required to facilitate such reductions, including participating in activity for at least 4 hours a week, a bodyweight reduction of over 5%, increased fibre intake, and a reduced fat intake.

The NICE public health guidance on preventing type 2 diabetes (NICE, 2011) calls for all commissioners and providers of local public health services to develop strategies to heighten awareness and prevention of type 2 diabetes.

Against the background of the accepted positive outcomes associated with structured group education classes such as the DESMOND programme (Davies et al, 2008), the "Prevention in Practice: Diabetes" structured education programme was piloted at the authors' practice in Northenden, Manchester, to explore a way of achieving such an effective prevention strategy at a practice level. The current practice population comprises just under 12 000 individuals and has five full-time-equivalent GPs and three practice nurses. The practice population is predominantly Caucasian, and the prevalence of diabetes is approximately 5.4%.

Objective

This pilot study was carried out to ascertain if a structured group education programme delivered by the primary healthcare team would evoke lifestyle modification in individuals with impaired glucose regulation. In addition, the pilot study aimed to explore whether these changes could have a positive impact on physical and psychological well-being and if ultimately this could delay or prevent the progression to type 2 diabetes in the individuals taking part in the study.

Methods

A search of the practice register identified those individuals with either impaired fasting glucose or impaired glucose tolerance. Twenty-four participants started the programme, which was delivered over a period of 6 months between September 2009 and April 2010 (Table 1). Participants were invited for a follow-up 1 year after the end of the 6-month study period in April 2011 to assess whether their lifestyle changes could be maintained.

Four groups of six clients were met with once a month, with input from the following members of the primary healthcare team:

- Practice nurse.
- Health trainer.
- Dietitians.
- Exercise consultants.
- GP.

To assess the participants' well-being, three questionnaires were used: the World Health Organization 5 Well-being Index (WHO, 1998), the General Self-Efficacy scale (Schwarzer and Jerusalem, 1995), and in addition, a simple question asking the participants to rate their perception of their general health on a scale of 0–10, with 0 being poor and 10 being perfect.

Page points

1. The "Prevention in Practice: Diabetes" structured education programme was piloted at the authors' practice in Northenden, Manchester.
2. The practice comprises just under 12 000 individuals and has five full-time-equivalent GPs and three practice nurses.
3. The practice population is predominantly Caucasian, and the prevalence of diabetes is approximately 5.4%.

Table 1. Tests carried out during each session

Measurements	Session					
	1	2	3	4	5	6
Well-being questionnaires	✓					✓
Height	✓					
Weight	✓	✓	✓	✓	✓	✓
Waist circumference	✓	✓	✓	✓	✓	✓
BMI	✓	✓	✓	✓	✓	✓
Blood pressure	✓	✓	✓	✓	✓	✓
Glucose tolerance test	✓					✓
Fasting glucose			✓			
Lipid profile	✓					✓

“Of the seven people who did not complete the programme, four cited work commitments, which suggests that alternative times to morning sessions might have been more beneficial.”

The results were translated into percentages.

The structure of each of the six sessions is outlined in the following text, and the tests carried out are summarised in *Table 1*.

Session 1

- Introduction.
- Overview of pre-diabetes and type 2 diabetes.
- Talk from each member of the team to advise on their roles.
- Baseline observations and well-being questionnaires.
- Food quiz.
- One-to-one session with each member of the team.
- Food diaries given out.

Session 2

- Overview of baseline results.
- Group discussion by dietitian and exercise consultants to advise on potential benefits of lifestyle modification and suggested ways to achieve this.
- One-to-one sessions with dietitian to review personal food diaries.
- One-to-one session with exercise consultants to give activity forms and facilitate access to gym, aqua classes, cycling, yoga, walking groups etc. as desired.
- One-to-one sessions with a health trainer and practice nurse.
- Monthly observations (see *Table 1*).

Session 3

- Overview of ongoing progress.
- Fasting glucose taken (followed by breakfast).
- Discussion by the health trainer on effecting behavioural change.
- Midway evaluation forms completed.
- Pedometers given out.
- One-to-one sessions with a health trainer and practice nurse.
- Monthly observations (*Table 1*).

Session 4

- Overview of ongoing progress.
- Group discussion from the dietitian

on food labelling and “how to survive Christmas”.

- One-to-one session with health trainer to include review of pedometer use.
- One-to-one sessions with dietitian, health trainer and practice nurse.
- Monthly observations (*Table 1*).

Session 5

- Overview of progress.
- Group discussion from health trainer on maintaining behavioural changes.
- One-to-one sessions with health trainer and practice nurse.
- Monthly observations and booking of appointments for glucose tolerance tests and blood tests prior to last meeting (*Table 1*).

Session 6

- Feedback on group results and discussion of the potential benefits of weight loss and having a healthier lifestyle.
- Repeat of food quiz done at first week.
- One-to-one session with practice nurse to give individual results. Copy of individual progress graphs and data provided.
- One-to-one session with GP to discuss results and review medication.
- One-to-one session with health trainer to complete “exit” well-being questionnaire.
- Evaluation of overall satisfaction with the course (venue, helpfulness of the team etc.) via a questionnaire.
- Discussion of “next steps” to include the need for annual reviews.

Results

Seventeen participants completed the programme. Of the seven people who did not complete the programme, four cited work commitments, which suggests that alternative times to morning sessions might have been more beneficial. One participant felt he already had sufficient information and required no further support and two patients suffered family bereavements and thus stopped their participation.

Overall, there was a total weight loss of 52 kg and reduction in waist circumference of 53 cm. The mean weight at the start of the programme was 88.5 kg and this lowered to 84.7 kg on completion, giving a mean reduction of 3.8 kg. The mean waist circumference was initially 100.8 cm, which lowered to 97.2 cm giving a mean reduction of 3.6 cm as the programme ended.

The fasting glucose levels, lipid profiles and blood pressure measurements showed no quantifiable changes. However, the glucose tolerance results showed that the mean post-prandial glucose level lowered by 1.7 mmol/L from a baseline of 8.2 mmol/L to 6.5 mmol/L. Completed well-being questionnaires indicated positive improvements (*Figures 1 and 2*).

Participants were invited back 1 year following completion of the programme. At this anniversary all individuals reported still having an improved lifestyle, with increased activity and a healthier diet.

There had been an average weight increase of 0.8 kg but overall this was still 3 kg below the mean weight at the start of the programme. The mean waist circumference showed an average further 0.9 cm reduction to give a mean total reduction of 4.5 cm from the start of the programme to the final follow-up 18 months later. Fasting glucose levels showed a mean reduction of 0.5 mmol/L from 6.1 mmol/L at onset to 5.6 mmol/L at the anniversary. None of the participants had progressed to type 2 diabetes.

These results look promising, but due to the small size and preliminary nature of the study it does not lend itself to accurate statistical analysis. It is also of note that there was not the funding to undertake glucose tolerance testing at the anniversary follow-up, and a future recommendation would be to perhaps use glycated haemoglobin (HbA_{1c}) as a measurement tool instead in line with guidance (WHO, 2011).

“Participants liked the fact that the members of the healthcare team came to their locality and thus were easily accessible.”

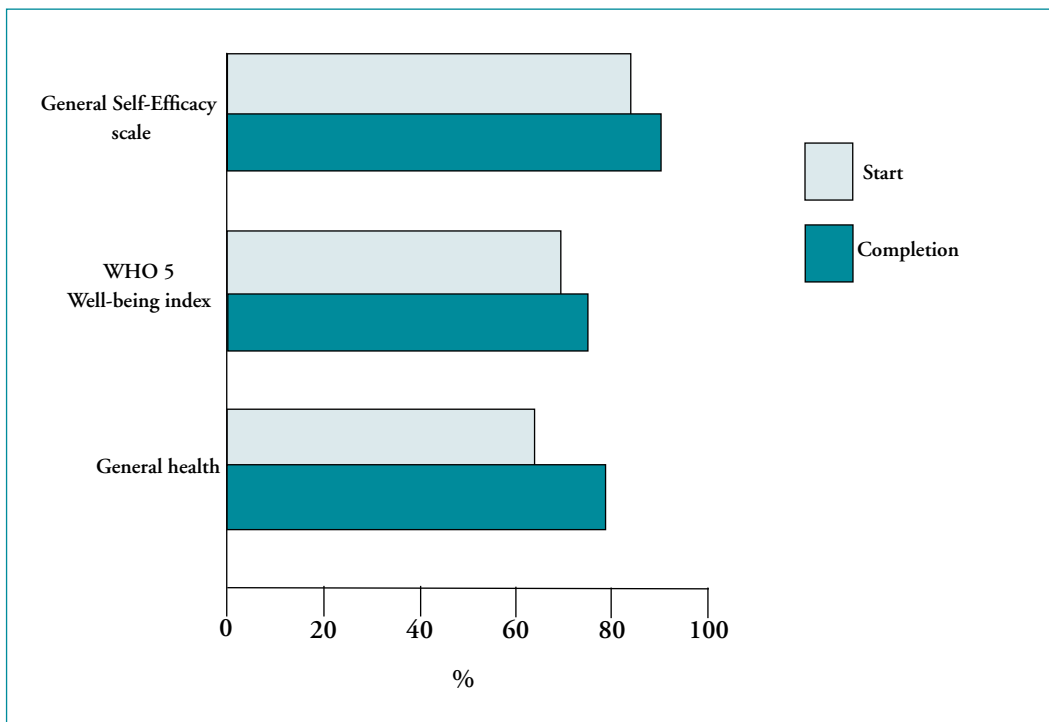


Figure 1. Well-being as assessed by three questionnaires at the start and completion of the study period using the WHO 5 Well-being Index (WHO, 1998), the General Self-Efficacy scale (Schwarzer and Jerusalem, 1995) and the General health questionnaire, which was devised by the authors and involved participants rating their perception of their general health on a scale of 0–10, with 0 being poor and 10 being perfect.

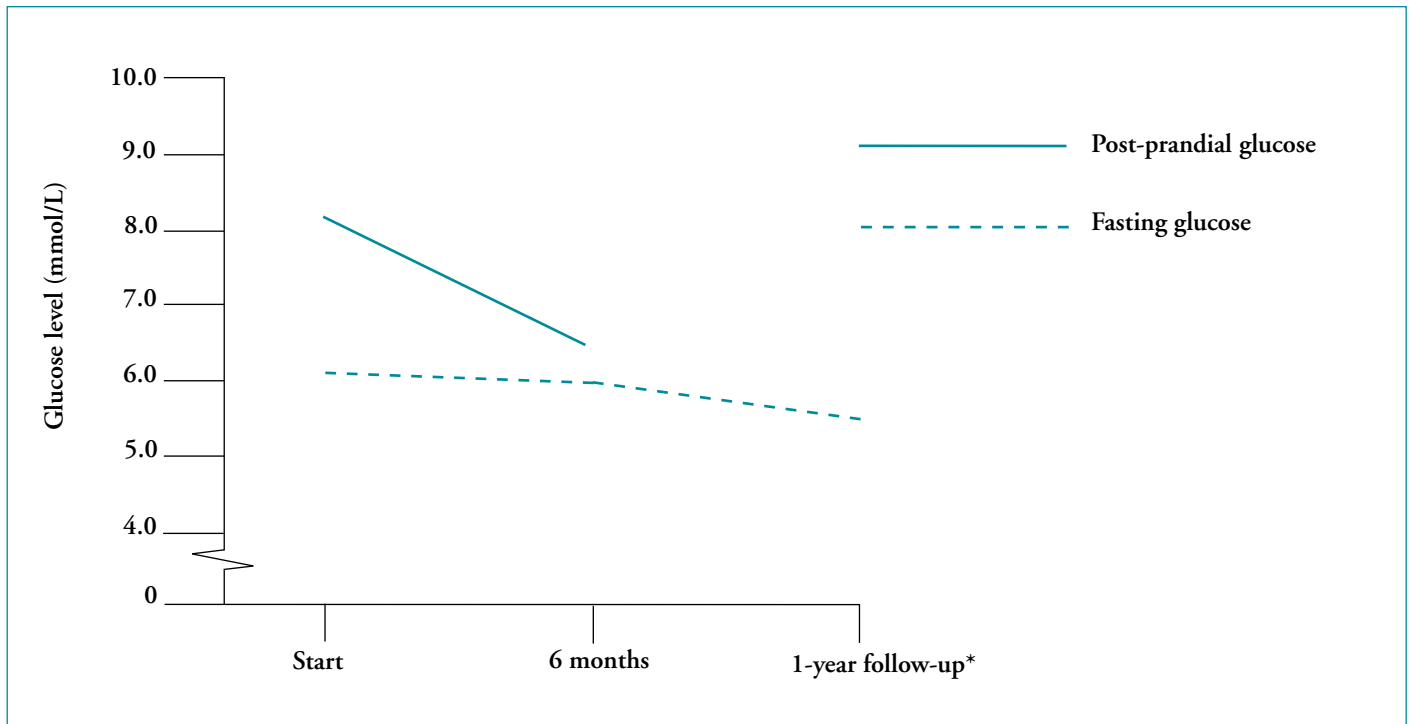


Figure 2. Change in post-prandial and fasting glucose levels during the study period. *The 1-year follow up took place 1 year after completion of the 6-month programme.

Discussion

This scheme is simple in its design and effectively draws upon existing resources to make a significant impact on improving both physical and emotional well-being in individuals at high risk of developing type 2 diabetes. Quite simply by bringing together groups of participants with members of the healthcare team in one venue, it allows the opportunity to explore and facilitate demonstrable, effective lifestyle changes. Participants liked the fact that the members of the healthcare team came to their locality and thus were easily accessible. As one client commented: "It's someone saying 'you have this,' and then immediately being able to see someone who can help."

It must be highlighted, however, that perhaps the success of this programme could have been predicted, as those individuals who attended were the motivated ones, willing to participate and commit their time. What this programme still does not resolve is how we achieve the challenge of engaging those who are less

motivated. Additional people were invited to take part, but for one reason or another were unable to participate. Arguably these are the individuals who are most at risk.

Another benefit of this scheme is that closer working relationships within the primary healthcare team have flourished, with improved communication and a heightened awareness of each other's roles and scope of services available. This has subsequently resulted in more timely and appropriate referrals. Within the practice itself, there is now a greater knowledge pertaining to impaired glucose regulation and its implications. A formal call and recall system has been established to give a full annual review to all those people with impaired glucose regulation to include blood tests, cardiovascular risk factor calculations and ongoing motivation in attaining a healthier lifestyle. In addition, the practice has secured the services of a health trainer for 2 hours a week to work with anyone wishing to explore ways in which to make their lifestyle a healthier one.

NICE guidance on the prevention of type 2 diabetes (2011) advises that for a prevention programme to be cost-effective, a spend of £10 per head needs to result in an average of 0.25 kg in weight loss, and a spend of £100 per head needs to result in an average 1 kg weight loss. The cost of this programme was in the time given by the healthcare professionals, which in most cases was incorporated into their monthly time allocation to participate with such clients. Indeed, in some cases their time was used more economically because of seeing clients in a group rather than multiple clients on a one-to-one basis. With an average weight loss of 3 kg the value for money afforded by this scheme should not be understated.

Conclusion

Finding effective approaches to prevention is essential if we are to have an impact on reducing the rapidly increasing prevalence of type 2 diabetes, and the authors would suggest that this programme is a simple, cost-effective method that appears to give positive results, and has been well received by those who took part. Although it is recognised that this is a pilot study and is limited by the small number of participants, we hope that commissioners and providers of local public health services will take note of the findings, and in moving forward it would be advantageous to roll this scheme out to greater numbers of people within primary care to assess if the results might be replicated. ■

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Davies MJ, Heller S, Skinner TC et al (2008) Effectiveness of the diabetes education and self management for ongoing and newly diagnosed (DESMOND) programme for people with newly diagnosed type 2 diabetes: cluster randomised controlled trial. *BMJ* **336**: 491–5

Diabetes UK (2010) *Diabetes in the UK: Key statistics on Diabetes*. Available at: http://www.diabetes.org.uk/Documents/Reports/Diabetes_in_the_UK_2010.pdf (accessed 08.11.12)

Diabetes UK (2011) *Diabetes in the UK 2011/2012 Key statistics on Diabetes*. Available at: <http://www.diabetes.org.uk/Documents/Reports/Diabetes-in-the-UK-2011-12.pdf> (accessed 08.11.12)

Gillies CL, Lambert PC, Abrams KR et al (2008) Different strategies for screening and prevention of type 2 diabetes in adults: cost effectiveness analysis. *BMJ* **336**: 1180–5

Nathan DM, Davidson MB, DeFronzo RA et al (2007) Impaired fasting glucose and impaired glucose tolerance: implications for care. *Diabetes Care* **30**: 753–9

NICE (2011) *Public health guidance 35: Preventing type 2 diabetes: population and community interventions*. NICE, London

Sarwar N, Gao P, Seshasai SR et al (2010) Diabetes mellitus, fasting blood glucose concentration, and risk of vascular disease: a collaborative meta-analysis of 102 prospective studies. *Lancet* **26**: 2215–22

Schwarzer R, Jerusalem M (1995). Generalized Self-Efficacy scale. In: Weinman J, Wright S, Johnston M (eds). *Measures in health psychology: A user's portfolio. Causal and control beliefs*. NFER-NELSON, Windsor, UK: 35–7

Tuomilehto J, Lindstrom J, Eriksson J et al (2001) Prevention of type 2 diabetes mellitus by changes in lifestyle among subjects with impaired glucose tolerance. *N Engl J Med* **344**: 1343–50

Unwin N, Shaw J, Zimmet P et al (2002) Impaired glucose tolerance and impaired fasting glycaemia: the current status on definition and intervention. *Diabet Med* **19**: 708–23

WHO (1998) *WHO-Five Well-being Index (WHO-5)*. Available at: <http://www.who-5.org/> (accessed 08.11.12)

WHO (2011) Use of Glycated Haemoglobin (HbA1c) in the Diagnosis of Diabetes Mellitus. *Abbreviated Report of a WHO Consultation*. WHO Geneva. Available at: <http://bit.ly/ROAydv> (accessed 08.11.12)

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