

# Exercise and education programme for people newly diagnosed with type 2 diabetes

Jennifer Logan, Sarah White, Deirdre Kyne Grzebalski, Gillian Hawthorne

A community-based service that delivers a combined exercise and education programme for people newly diagnosed with type 2 diabetes was established in Newcastle. This service has now been running for almost 4 years and, during that time, has undergone evaluation and curriculum redesign. This article describes the stages of development of this service, from the initial pilot to the established programme.

The appointment of a diabetologist with a community remit by Newcastle Primary Care Trust led to a community diabetes team being put together in 2001. The team included the diabetologist, a clinical nurse lead and two community diabetes specialist nurses (Gillian Hawthorne, Deirdre Kyne Grzebalski, Sarah White and Jennifer Logan, respectively). Broadly, its aim is to reflect the delivery strategy of the National Service Framework by supporting the shift of the management of type 2 diabetes from the specialist service into primary care (Department of Health [DoH], 2001). In addition, the team acts as a resource for all healthcare professionals working in community-based services in the same locality.

A full review of the diabetes service provision within primary care was undertaken by the team to assess current practice and training needs. A disparity between GP practices in the authors' locality was identified: there were those that

provide a sophisticated diabetes clinic with robust review and recall systems and those that have clinics which are still in their infancy and, therefore, still require a lot of development. However, the main theme that emerged from the review was universal: the gap in service provision was in the education provided for people newly diagnosed with type 2 diabetes. From the review it was noted that practice nurses identified limitations in the time available to provide education and that people with diabetes were often returning to repeat individual appointments to cover the educational aspects of their diabetes management.

Other factors that the review identified included a lack of:

- educational resources
- access to supportive literature
- appropriate facilities to accommodate group education.

These findings gave the community diabetes team a focus to address the gap in service provision and led to the development

## Article points

1. A review of diabetes services following the introduction of a community diabetes team identified a gap in provision of education for people newly diagnosed with type 2 diabetes.
2. The overall aim of the multidisciplinary team is to deliver appropriate information and advice for people newly diagnosed with diabetes.
3. Increased numbers of people diagnosed with type 2 diabetes prompted a group approach to education.

## Key words

- Community diabetes team
- Exercise programme
- Education programme

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**Page points**

1. The exercise and education programme takes a multidisciplinary approach and involves diabetes specialist nurses, dietitians and the community podiatry team.
2. Each exercise session is facilitated by an exercise coordinator.
3. The programme participants are referred by their GP or practice nurse, who will have assessed them as being suitable for taking gentle exercise.
4. A pilot programme was delivered across two sites in Newcastle. It was delivered over five weekly sessions, each of 2 hours' duration, consisting of a 45-minute educational talk on different aspects of the management of diabetes, followed by exercise and time to chat to peers and healthcare professionals.

of a community-based exercise and education programme. Another influential factor, also learnt from the review, in implementing this programme was the inconsistency in the standards of knowledge and training, at practice level, regarding the management of type 2 diabetes. Structured education programmes for GP and practice nurse training have, therefore, evolved in an attempt to address this issue.

**Factors considered in service development**

The increasing number of people being diagnosed with type 2 diabetes in the authors' locality (as apparent from the Newcastle diabetes register for the period 2001–2005) was in itself a factor that prompted a group approach to education. In the authors' opinion group education saves the healthcare professional's time and resources, and also provides peer support for the individual with diabetes. The benefits of group education have been demonstrated elsewhere: there is an awareness that participation in a cohesive group could promote maintenance of any behaviour change achieved (Estabrooks and Carron, 1999; Estabrooks, 2000; Walker and Rodgers, 2004).

It is well known that increasing levels of physical activity improves insulin sensitivity and has a positive effect on both the lipid profile and blood pressure of people with diabetes (Kirk et al, 2003). The observed low levels of physical activity and high body mass indices in this group of people demonstrated a real need to incorporate an activity or exercise component into the programme.

The programme that was developed takes a multidisciplinary approach and involves diabetes specialist nurses, dietitians and the community podiatry team. Each exercise session is facilitated by an exercise coordinator. The programme participants are referred by their GP or practice nurse, who will have assessed them as being suitable for taking gentle exercise.

**Pilot programme and evaluation**

A pilot programme with 58 participants was implemented at two community sports centres in 2002: one in the east of the city and one in the west. It was delivered over five weekly sessions, each of 2 hours' duration, consisting of a 45-minute educational talk on different aspects of the management of diabetes, followed by up to 1 hour of exercise and then 15–30 minutes for refreshments, during which informal discussions took place between the participants and with the healthcare professionals. The exercise component consisted of a warm-up followed by exercises designed to work muscle groups that are used during normal daily activities and the use of cardiovascular equipment; the session was finished with cool-down stretches.

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

- weight
- height
- body mass index
- self-reported exercise levels based on the European Prospective Investigation into Cancer Study-Norfolk Physical Activity Questionnaire (EPIC-NPAQ)
- baseline diabetes knowledge ascertained by a short quiz developed by the community diabetes team (the quiz consisted of 14 questions, some of which have two possible correct answers; two marks were awarded for a correct answer and zero for a wrong, giving a possible total of 28)
- HbA<sub>1c</sub> levels ascertained from GP-held records.

Data were collected to measure the above outcomes at baseline and 6 and 12 months after the programme. Evaluation of the pilot demonstrated the following.

- Mean HbA<sub>1c</sub> decreased from 8.0% at baseline to 7.0% at 6 months; this was maintained at 12 months.
- Mean waist circumference decreased from 107 cm at baseline to 101 cm at 6 months;

this was maintained at 12 months.

- Diabetes knowledge scores increased significantly at 6 months; this was maintained at 12 months.

Based on these pilot data, the programme was rolled out to additional sports centres across the city and incorporated into routine service provision.

Because of low numbers of dietitians working in Newcastle Primary Care Trust the dietetics service was also revised. The local dietetics service was unable to deliver appropriate dietary advice within their desired standard of an appointment within 4 weeks of diagnosis of type 2 diabetes. This resulted in an extension to the length of the exercise and education programme in order to incorporate additional dietary messages and meet local requirements.

A new referral pathway into the programme was also devised: GPs and practice nurses refer all those newly diagnosed with type 2 diabetes to a rapid access dietetic clinic. It is aimed that this appointment takes place within 4 weeks of diagnosis and provides an initial and individual dietary assessment. Importantly, at this appointment, the community dietitians will introduce the community exercise programme and reinforce the benefits of attending in order to optimise self-management of diabetes. An 8-week exercise programme is now delivered that includes additional dietary sessions (see *Table 1*).

### **The established programme**

The content of the established programme is summarised in *Table 1*. The dietary sessions use active learning techniques and encourage group participation with the aim being to help people to improve their understanding of:

- different food groups
- portion sizes
- nutritional labelling
- healthy choices when travelling and eating out.

The overall aim of the multidisciplinary team is to deliver appropriate information and advice when people are newly diagnosed with diabetes, enabling the participants to make healthier choices and support them to make changes to their behaviour that will improve their outcomes and reduce their long-term risks.

In total, six sports centres are now used across the city and three programmes are run at each venue per year. The multi-centre method allows for the programme to be more easily accessed by more people with type 2 diabetes. More than 50% of those invited attend the programme, and of those who attend the first session, 90% complete the full 8-week programme. The healthcare team believes that extending the programme (from 5 to 8 weeks) has had a positive impact on group dynamics and, therefore, peer support, increasing motivation and commitment. In addition, as it is now a prolonged exercise experience, confidence and competence in the ability to exercise is established. The amount of exercise taken by the individual each week is recorded so that progression can be recognised.

Care for those who do not take up the offer of participating in this programme is carried on as normal. They are offered a place on the programme at a later date by their GP or practice nurse.

### **Evaluation**

The exercise and education programme was evaluated during 2004/05 in collaboration with

**Table 1. Outline of the week-by-week content of the revised Newcastle exercise and education programme. The additional dietetics content during weeks 4, 6 and 8 were incorporated due to the shortage of dietitians in the locality.**

Week	Redesigned programme
1	The benefits of exercise
2	What is diabetes? Its causes and consequences
3	Food groups
4	Healthy portion sizes
5	Managing change
6	Food labelling
7	Eating out and alcohol
8	The importance of foot care

researchers from the Primary Care Development Centre at Northumbria University. The sample size for evaluation purposes was 68, all recruited from across the six centres (see *Figure 1* for the results).

Results showed statistically significant improvements in body mass index and blood glucose levels (HbA<sub>1c</sub>). Focus-group data indicated that participants felt the educational component of the programme had had a positive impact on the management of their diabetes and facilitated their understanding of their condition. However, the evaluation results of the exercise component of the programme were not as good and the results of a validated questionnaire (EPIC-NPAQ) showed no change in the participants' self-reported levels of physical activity following attendance at the programme. From this evaluation recommendations were made to redesign the exercise component of the programme, taking into account individual limitations and preferences of different types of exercise. The exercise component is currently under revision.

### Discussion

A driving force for facilitating people with diabetes to take up regular exercise is the Government's white paper for public health,

*Choosing Health: Making healthy choices easier* (DoH, 2004). This document aims to reduce the risk of major chronic conditions, such as type 2 diabetes, by enabling people to make healthier choices. Increasing physical activity is recommended as over a third of all people are not active enough to benefit their health (DoH, 2004). However, despite the evidence for the benefits of increased exercise (Kirk et al, 2003), it is difficult to encourage people with diabetes to take regular exercise (Holland et al, 2002).

The curriculum for this education and exercise programme is now being redesigned to allow for individual action planning and target setting. A session on understanding behaviour change is to be incorporated to encourage participants to make individual choices and decisions as to how they can continue their increased physical activity levels. In addition, participants will also be asked to review their level of confidence in their ability to undergo change. Several studies highlight that individualised programmes of physical activity are more likely to increase sustained levels of regular exercise (for example: Clark, 2002; DiLoreto et al, 2003; Hill, 2003).

In addition to the delivery styles of supervised exercise programmes (Clark, 2002; Holland et al, 2002), research has also been carried out to identify factors that have an impact on whether people can change their exercise behaviour (Plotnikoff et al, 2000). In this Canadian study, Plotnikoff and colleagues (2000) showed that self-efficacy was the strongest predictor of changing exercise behaviour to increase physical activity levels. The process of behaviour change was also found to be closely associated with the participants' success in increasing their physical activity levels.

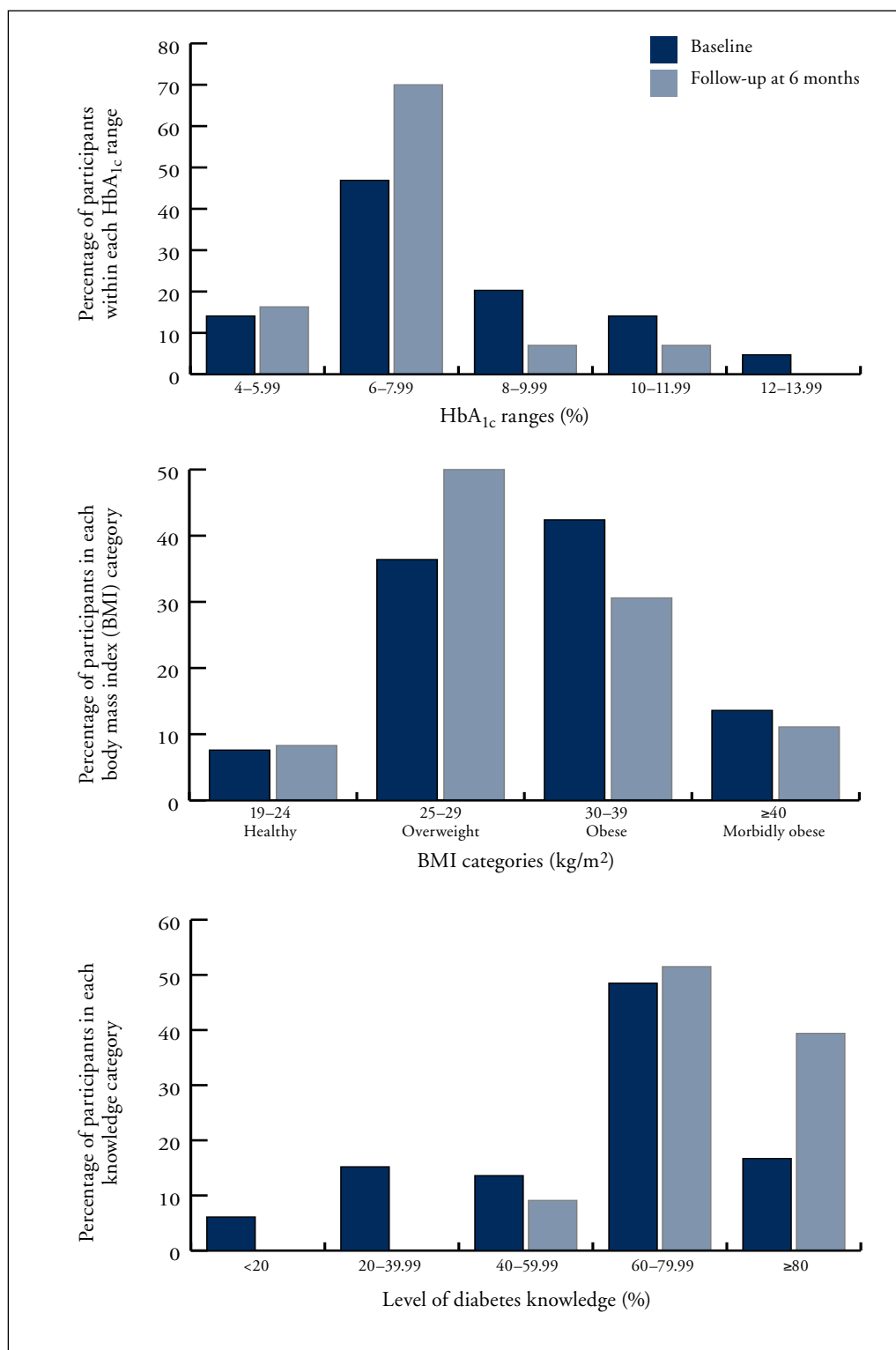
Holland and colleagues (2002) reported that before any behaviour change towards exercise is seen people must be:

- convinced that regular activity will benefit them
- educated about how to exercise safely

### Page points

1. Results of the evaluation showed statistically significant improvements in body mass index and blood glucose levels.
2. Focus-group data indicated that participants felt the educational component of the programme had had a positive impact on the management of their diabetes and facilitated their understanding of their condition.
3. The curriculum for this education and exercise programme is now being redesigned to allow for individual action planning and target setting.
4. A session on understanding behaviour change is to be incorporated to encourage participants to make individual choices and decisions as to how they can continue their increased physical activity levels. In addition, participants will also be asked to review their level of confidence in their ability to undergo change.

*‘In light of the findings from the exercise and education programme’s evaluation and the literature reviewed, the curriculum for the programme is being revamped to incorporate self-efficacy and adult learning.’*



*Figure 1. HbA<sub>1c</sub>, body mass index and diabetes knowledge of participants before starting on the exercise and education programme compared with 6 months after its completion. Knowledge was assessed using a quiz developed by the community diabetes team.*

- given regular encouragement to maintain exercise behaviour changes.

In light of the findings from the exercise and education programme's evaluation and the literature reviewed, the curriculum for the programme is being revamped to incorporate self-efficacy and adult learning.

### Conclusions

Changes to the curriculum for the exercise and education programme in Newcastle are being developed in order to facilitate the empowerment of individuals newly diagnosed with type 2 diabetes in order to maintain their increased physical activity levels following participation in the programme. Standard 3 of the National Service Framework for diabetes (DoH, 2001) states that healthcare professionals need to ensure that people with diabetes are empowered to self-manage their diabetes.

Facilitation skills will be used by the multidisciplinary team to help people manage and sustain behaviour changes and to enable participants to make individual choices and decisions as to how they can continue their increased physical activity levels. Evaluation processes will then be put in place to determine the personal factors that influence whether a person continues to partake in regular exercise. Future recommendations have been made for an action research study to be carried out to investigate if people do feel empowered to maintain their increased physical activity levels following participation in the programme.

Since the inception of the exercise and education programme the National Institute for Health and Clinical Excellence, the Department of Health and Diabetes UK have published a report containing criteria that all such programmes should meet (DoH, 2005). For this programme a curriculum has been written and educators have been trained. A working group has also been set up to ensure that an underpinning philosophy is developed and quality assurance and audit procedures are met. ■

### Acknowledgements

Funding for the exercise and education programme outlined herein has been made available by Newcastle Primary Care Trust. The programme is an integral part of the diabetes service provided by the Trust.

Clark M (2002) Lifestyle management in patients with type 2 diabetes. *Journal of Diabetes Nursing* 6(6): 182–7

Department of Health (DoH; 2001) *National Service Framework for Diabetes: Standards*. DoH, London

DoH (2004) *Choosing Health: Making healthy choices easier*. DoH, London

DoH (2005) *Structured Patient Education in Diabetes. Report from the Patient Education Working Group*. DoH, London

DiLoreto C, Fanello C, Lucidi P et al (2003) Validation of a counseling strategy to promote the adoption and the maintenance of physical activity by type 2 diabetic subjects. *Diabetes Care* 26(2): 404–8

Estabrooks PA (2000) Sustaining Exercise Participation through Group Cohesion. *Exercise and Sport Sciences Reviews* 28(2): 63–7

Estabrooks PA, Carron AV (1999) Group Cohesion in Older Adult Exercisers: Prediction and Intervention Effects. *Journal of Behavioral Medicine* 22(6): 575–88

Hill J (2003) Empowerment of people with diabetes: a practical approach. *Journal of Diabetes Nursing* 7(6): 213–6

Holland J, Furness J, Griffiths S, Andrews R (2002) A supervised exercise programme for people with diabetes. *Journal of Diabetes Nursing* 6(5): 153–6

Kirk A, MacIntyre P, Mutrie N, Fisher M (2003) Increasing Physical Activity in People With type 2 diabetes. *Diabetes Care* 26(4): 1186–92

Plotnikoff RC, Brez S, Hotz SB (2000) Exercise Behavior in a Community Sample With Diabetes: Understanding the Determinants of Exercise Behavioural Change. *The Diabetes Educator* 26(3): 450–9

Walker R, Rodgers J (2004) How to make a success of group education. *Journal of Diabetes Nursing* 8(3): 92–6

### Page points

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2. Facilitation skills will be used by the multidisciplinary team to help people manage and sustain behaviour changes.
3. Evaluation processes will then be put in place to determine the personal factors that influence whether a person continues to partake in regular exercise.
4. Future recommendations have been made for an action research study to be carried out to investigate if people do feel empowered to maintain their increased physical activity levels following participation in the programme.