Institution: University of Sheffield

Unit of Assessment: 3C – Allied Health Professions: Biomedical science

Title of case study: Health and economic benefits of a self-management training programme for Type I diabetes

1. Summary of the impact

DAFNE (Dose Adjustment for Normal Eating) is a structured training programme in Type I diabetes self-management whose development was led by researchers at the University of Sheffield. As a direct result of these research findings, and the demonstration of improved outcomes, there has been a change in the approach to management of Type I diabetes from hospital based, doctor/nurse centric care to patient centred self-management. The Department of Health now mandates structured training in England and Wales, with DAFNE courses provided in a third of UK centres.

2. Underpinning research

Biomedical outcomes among adults with Type 1 diabetes were poor in the UK compared to other countries in part due to inadequate self-management among those with the condition. A research project was launched in 1998, led by Heller (University of Sheffield, 1998-date), to develop effective models of training in the skills of insulin therapy. A German model, whose biomedical benefit had been demonstrated in a small, non-randomised trial, was identified and a clinical team from Sheffield, together with colleagues from North Tyneside and King's College, London, visited the German centre and determined that the intervention might be effective in a British setting. Heller was awarded a grant (£300k) by the British Diabetic Association to adapt the German model for delivery in a UK setting and to fund a randomised clinical trial in Sheffield and two other centres that would measure biomedical, quality of life and other psychosocial outcomes (parameters that had not been previously evaluated). The intervention, formatted for a British diet, was delivered over 5 days but in an outpatient setting (as opposed to inpatients in Germany). Adults with established Type 1 Diabetes were recruited from the three centres and were randomised to undertake the course immediately or else act as 'standard therapy controls' for 6 months, before undertaking the course themselves.

Blood glucose control improved significantly and substantially (to a level of improvement that would reduce the chances of developing diabetic eye and kidney disease by over 25%) in those undergoing skills training, while it was unchanged in the standard therapy controls. However, blood glucose in these controls improved 6 months later after they had, in turn, undertaken their skills training. The intervention group continued to show improved blood glucose control 12 months following their course. Psychosocial outcomes (including quality of life) improved markedly and were maintained for the full 12 months [**R1**]. A health economic evaluation was undertaken by health economists at the University of York (with clinical input from Heller and Sue Roberts, National Clinical Director for Diabetes, from North Tyneside General Hospital) and published in 2004 [**R2**], which reported the intervention to be strongly cost effective and that it would pay for itself in 4-5 years due to the reduced complication rate expected from improved glycaemic control. An evaluation of the original trial cohort was undertaken after another 3 years and demonstrated that, while all blood glucose control had slipped, it remained significantly improved and psychosocial outcomes were still strongly positive [**R3**].

3. References to the research

R1. DAFNE Study Group. (2002). Training in flexible, intensive insulin management to enable dietary freedom in people with type 1 diabetes: dose adjustment for normal eating (DAFNE) randomised controlled trial. *BMJ* 325: 746-751 doi: 10.1136/bmj.325.7367.746 (Heller guarantor and corresponding author).

R2. Shearer A, Bagust A, Sanderson D, Heller S, Roberts S (2004). Cost-effectiveness of flexible intensive insulin management to enable dietary freedom in people with Type 1 diabetes in the UK. Diabet Med 21: 460-467. doi: 10.1111/j.1464-5491.2004.01183.x

R3. Speight J, Amiel SA, Bradley C, Heller S, Oliver L, Roberts S, Rogers H, Taylor C, Thompson G (2010). Long-term biomedical and psychosocial outcomes following DAFNE (Dose Adjustment For Normal Eating) structured education to promote intensive insulin therapy in adults with sub-optimally controlled Type 1 diabetes. Diabetes Res Clin Pract 89: 22-29. doi: 10.1016/j.diabres.2010.03.017

4. Details of the impact

The research provided strong clinical evidence that skills training in the management of insulin therapy was effective in an outpatient setting and led to the creation of a 5-day outpatient based course with accompanying materials for use on UK patients. This has led to a paradigm shift in the approach to the management of Type 1 Diabetes from hospital based, doctor/nurse centric care to user centred self-management that has delivered the following impacts:

Change to clinical guidelines

Publication of the paper in the BMJ plus the subsequent responses from the UK diabetes community prompted NICE to include within the scope of guidelines on management of Type 1 diabetes a review of the literature on diabetes related education. The guidelines state in paragraph 7.3 "*NHS trusts, primary care organisations and general practices should ensure that responsibility is clearly defined for offering and providing educational programmes for people with diabetes and for considering referral to the DAFNE programme as one option for people with type 1 diabetes*" [**S1**].

Paragraph 1.4 of the same NICE guidance, states "*It is considered that the Dose Adjustment for Normal Eating (DAFNE) programme may be a suitable option for individuals with type 1 diabetes, being one means of enabling people to self-manage this condition*." [**S1**].

In addition, in 'Understanding NICE guidance – information for people with diabetes, and the public' it states on pages 6 and 7: "*What has NICE recommended? NICE has recommended that all people with diabetes should be offered structured education, provided by a trained specialist team of health professionals. NICE considers the team should include a diabetes specialist nurse*" [**S2**].

It also goes on to say "*The DAFNE (short for Dose Adjustment For Normal Eating) training course is one example of a patient-education model for people with type 1 diabetes. A DAFNE course lasts 5 days and teaches groups of people to tailor their insulin doses according to the amount of starchy foods they eat and their lifestyle. DAFNE is a 'structured' programme*." [**S2**].

DAFNE is also the only structured skills training course for adults with Type 1 diabetes that meets the requirements of a Department of Health report from the Patient Education Working Group [**S3**]. To quote Rosie Winterton MP (Minister of State for Health Services in 2005), "*The DAFNE and DESMOND (Diabetes Education and Self-Management for Ongoing and Newly Diagnosed) education programmes provide a nationally-led, evidence-based approach for type 1 and type 2 diabetes*" [**S3**, page 3].

Current clinical status

The Department of Health initially funded a roll-out across the country to 10 additional centres within the Expert Patient Programme and DAFNE is now delivered by 75 specialist diabetes services in the UK, Northern Ireland and the Republic of Ireland [**S4**]. Based on the number of acute Trusts delivering diabetes services (patients with Type 1 Diabetes are cared for in secondary care), this represents around 35% of secondary centres [**S5**].

Since 2008, more than 25,000 adults with Type 1 diabetes have completed a DAFNE course in the UK [**S6**] representing approximately 15% of adults with the disease in England and Wales (figures estimated from those contained in [**S7**]). Currently, there are 550 courses offered every year, with around 4000 new DAFNE graduates.

DAFNE has also been exported to Australia (as Oz DAFNE), being delivered in 14 centres including New Zealand. Teams from Spain, South Africa, Nigeria and Kuwait have recently travelled to the UK to observe DAFNE and receive training. The numbers of graduates in other countries with growing DAFNE programmes since 2008 are as follows: Australia, New Zealand and Singapore (2697), Kuwait (159) [**S8**].

Economic impact

DAFNE has delivered cost savings to the NHS estimated by NICE to be £48 million per year nationally [**S9**].

5. Sources to corroborate the impact

S1. NICE Technology Appraisal Guidance 60: Guidance on the use of patient-education models for diabetes. Issue date: April 2003:

http://www.nice.org.uk/nicemedia/live/11496/32610/32610.pdf.

Although published in 2003, this guidance remains valid. There have been no updates.

S2. NICE guidance patient-education models for diabetes. Understanding NICE guidance – information for people with diabetes and the public. Issue date: April 2003:

http://www.nice.org.uk/nicemedia/live/11496/32612/32612.pdf.

Although published in 2003, this guidance remains valid. There have been no updates.

S3. Department of Health: Structured Patient Education in Diabetes. Report from the Patient Education Working Group. 2005:

http://www.ntac.nhs.uk/web/FILES/InsulinInfusion/dh_4113197.pdf

S4. http://www.dafne.uk.com/Who_we_are_-I516.html

S5. http://www.yhpho.org.uk/resource/view.aspx?RID=139172

S6. Data contained in the DAFNE Strategic Plan 2012–2017 (http://tinyurl.com/n88u5ec).

S7. Figures used to estimate number of adults completing a DAFNE course in the UK:

http://www.diabetes.org.uk/Documents/Reports/Diabetes_in_the_UK_2010.pdf

S8. Email dated 22/10/13 from National Director - DAFNE Programme (on file).

S9. http://www.dafne.uk.com/509.html