Institution: University of Leicester

Unit of Assessment: UoA1

Title of case study: Self-management in the prevention and treatment of type 2 diabetes: revolutionising patient care within usual healthcare practice

1. Summary of the impact

Elevated blood glucose levels - the hallmark of diabetes - is estimated by the World Health Organization to be the third leading cause of premature death globally. Around 4 million people in the UK have been diagnosed with diabetes; their treatment accounts for 10% (£10 billion) of NHS expenditure. Self-management strategies and the promotion of a healthy lifestyle are fundamental to the treatment and prevention of type 2 diabetes (T2DM). Since 2008, Leicester's Diabetes Research Centre has developed, evaluated, disseminated and implemented a range of programmes based on a technique called structured education. The flagship DESMOND programme is run in over half of all clinical commissioning groups (CCGs), affecting thousands of people with newly diagnosed T2DM. The Walking Away prevention programme has been widely implemented in the UK, Ireland and Australia. These programmes are the only nationally available evidence-based structured education programmes for the prevention and management of T2DM.

2. Underpinning research

Background

In 2000 the national service framework (NSF) acknowledged that structured education, a group-based person-centred method of promoting self-management skills and a healthy lifestyle, was pivotal to T2DM care. However, evidenced-based self-management programmes suitable for translation into routine care were lacking, and NICE were unable to find studies that had adequately evaluated the benefits of structured education. The Diabetes Education and Self-Management for On-going and Newly Diagnosed (DESMOND) programme was set up in response to this need by the University's Diabetes Research Unit (now Centre). The aim was to develop and evaluate a structured education programme to the same rigorous standards as pharmaceutical interventions; this was achieved by adhering to the Medical Research Council's framework for complex interventions, including multiple R&D pilot phases. The six-hour programme, led by trained educators, offers groups of up to 10 people up-to-date information about diabetes and risk; practical advice on diet, activity and medication; and an opportunity to meet and talk to others in the same situation.

Evaluation of DESMOND

DESMOND was evaluated in national multi-centre cluster randomised controlled trial involving 207 GP practices and 824 participants. After 12 months, the programme was found to be effective at promoting some health behaviours, reducing depression and reducing cardiovascular disease risk (**1**). A later high-impact publication demonstrated that DESMOND was likely to be highly cost-effective with a mean incremental cost per quality-adjusted life year gained of £2,092 (**2**). DESMOND remains the only T2DM self-management programme in the UK that has been subject to a national multi-centre evaluation in primary care and a rigorous cost-effectiveness analysis. This has provided health care commissioners and policy makers with the high level of evidence needed to make informed decisions about prioritisation and resource allocation for diabetes management.

Expansion of the approach into prevention

The Centre expanded the DESMOND approach into the prevention of T2DM. The launch of the Vascular Checks programme in 2008 (renamed NHS Health Checks) signified a shift in health care priority towards prevention, and 40% of the budget for this new initiative was modelled on the identification and management of T2DM risk. However, there was no relevant evidence from interventions that were suitable for implementation within the NHS, so the PREPARE programme was developed to the same rigorous standards as those for DESMOND. The programme was found, through a proof-of-concept randomised controlled trial, to be highly effective at promoting improved health behaviour and glucose regulation at 12-months and 24-months (**3,4**).

The Centre demonstrated, through complex modelling, that the prevention of T2DM is likely to be cost-effective when integrated into diabetes care (**5,6**). PREPARE was expanded to meet the needs of all individuals with a high risk of type 2 diabetes and renamed Walking Away from Type 2 Diabetes. A full educator training and quality assurance programme was developed and piloted through the local CLAHRC (Collaboration for Leadership in Applied Health Research and Care).

The research platform is an exemplar of an NIHR funded translational pathway (through dedicated Biomedical Research Unit (BRU) and CLAHRC funding) whereby new lifestyle therapies continue to be developed, evaluated and translated into routine care in order to meet the on-going needs of patients and the NHS. This will ensure the Centre stays at the forefront of translational diabetes research and continues to shape the evidence-base, national and international health care guidance and recommendations, and patient care.

Key researchers: Melanie J Davies, Professor of Diabetes Medicine (2006-present); Kamlesh Khunti, Professor of Primary Care Diabetes and Vascular Medicine (2007-present); Dr Thomas Yates, Senior Lecturer in Physical Activity, Sedentary Behaviour and Health (2008-present).

3. References to the research

1. **Davies MJ**, Heller S, Campbell MJ, Carey ME, Dallosso HM, Daly H, Eaton S, Fox C, Rantell K, Rayman G, Skinner TC & **Khunti K**. Effectiveness of a structured education programme on individuals newly diagnosed with Type 2 diabetes: a cluster randomised controlled trial of the DESMOND programme. BMJ 2008 336: 491-495.
2. Gillett M, Dallosso HM, Dixon S, Brennan A, Carey ME, Campbell MJ, Heller S, **Khunti K**, Skinner T, **Davies MJ**. Delivering the diabetes education and self-management for ongoing and newly diagnosed (DESMOND) programme for people with newly diagnosed type 2 diabetes: cost effectiveness analysis. BMJ, 2010; 341,c4093.
3. **Yates T, Davies M**, Gorely T, Bull F, **Khunti K**. Effectiveness of a pragmatic education programme aimed at promoting walking activity in individuals with impaired glucose tolerance: a randomized controlled trial. Diabetes Care 2009; 32: 1404-10.
4. **Yates T, Daves M**, Sehmi S, Gorely T, **Khunti K**. The Prediabetes Risk Education and Physical Activity Recommendation and Encouragement (PREPARE) programme study: Are improvements in glucose regulation sustained at two years? Diabetic Medicine, 2011; 28, 1268-1271
5. **Khunti K,** Gray LJ, Skinner T, Carey ME, Realf K, Dallosso H, Fisher H, Campbell M, Heller S, **Davies MJ**. Effectiveness of a diabetes education and self-management programme (DESMOND) for people with newly diagnosed type 2 diabetes mellitus: three year follow-up of a cluster randomised controlled trial in primary care. *BMJ* 2012;344:e2333 (doi: 10.1136/bmj.e2333)
6. Gillies, C, Lambert P, Abrams K, Sutton A, Cooper N, Hsu R, **Davies M**, and **Khunti K**. Different strategies for screening and prevention of type 2 diabetes in adults: cost effectiveness analysis. BMJ 2008;336: 1180-1185.

Grants

Since 2008, the centre has been awarded over £12 million in research grants directly aimed at furthering knowledge around the use of structured education and lifestyle factors in the management and prevention of T2DM, from funders including NIHR, HTA and MRC.

4. Details of the impact

Type 2 diabetes currently accounts for the majority (around 90%) of the diabetes burden. A further 10 million individuals are at high risk of progressing to T2DM, identified through impaired blood glucose regulation below the threshold for diabetes, and will form the majority of the diabetes burden in the future – the cost to the NHS, already high at 10%, is projected to increase to 17% by 2035. Given these trends, the effective prevention and treatment of diabetes is a stated national healthcare priority. Unhealthy lifestyle behaviours account for the vast majority (80%) of T2DM cases, so lifestyle interventions play an integral role in prevention and management strategies.

The Diabetes Research Centre runs the largest portfolio of translational research for the prevention and management of type 2 diabetes nationally and, in collaboration with its NHS partners, has had a significant impact on how diabetes is targeted in routine clinical care.

Impacting on national and international guidance

NICE guidance: The Unit's work was used to inform NICE through their Quality Standard for Diabetes 2011, which states that structured education programmes should be available for all individuals with T2DM (**A**).The Diabetes Research Unit (Khunti is Chair; Yates and Davies members) significantly contributed to, and shaped, new NICE Guidance for the prevention of type 2 diabetes issued in 2012 (**B**). The Walking Away programme was presented as expert testimony to NICE as part of the new guidance for the prevention of T2DM, and is listed by NICE as an example of best practice around the implementation of the new guidance for the prevention of T2DM (**C**).
Department of Health: The DoH continues to recognise the DESMOND programme as the only nationally available structured education programme for T2DM (**D**). Davies and Khunti are part of the Vascular Board, which helps inform government policy, including the Vascular Checks Programme – lately the NHS Health Checks Programme. The impact of the work around diabetes management and prevention lead to both academics being invited, by the UK National Screening Committee to lead on developing the content and structure of The Handbook of Vascular Risk Assessment, Risk Reduction and Risk Management (both the original 2008 version and updated 2012 version). The handbook is widely used within the Department of Health (**E**).

Other: In 2009 Khunti, Davis and Yates significantly contributed to guidance issued by the South Asian Health Foundation for diabetes research priorities in British South Asians (**F**). Work around self-management in T2DM significantly informed the latest edition (2011) of the prestigious Oxford Textbook of Endocrinology and Diabetes, co-edited by Davies (**G**).

International: Walking Away contributed to a widely circulated collection of examples of international best practice in the implementation of diabetes prevention programmes commissioned by the World Congress on the Prevention of Diabetes and its Complications; this document is widely used by policy makers nationally and internationally (**H**). Davies and Yates contributed to an international level expert review, 2012, of the evidence for nonpharmacological interventions for the prevention of type 2 diabetes mellitus and this article has had a significant impact on diabetes prevention initiatives internationally (**I**).

Improving patient care and outcomes through DESMOND and Walking Away

Clinical commissioning groups (CCGs): DESMOND has been implemented in over half of all CCGs (formerly PCTs) nationally and has substantially improved the quality and breadth of treatment offered to those with T2DM. It has been found to be highly effective at improving clinical outcomes in those with T2DM and microalbuminuria, which occurs when the kidney leaks small amounts of protein into the urine (**J**). DESMOND is the mostly widely used structured education programme in primary care nationally, benefiting thousands of people annually (**K**). It has been tailored to diverse non-English speaking South Asian communities within the UK in order to increase the reach of the programme within primary care (**L**). The Centre has on-going collaborations with CCGs nationally to ensure that prevention and self-management programmes continue to be commissioned and improve health care.

International reach: The Centre has supported the translation and implementation of DESMOND across large regions of both Ireland and Australia as part of routine diabetes management pathways, as well as informed patient education models in the Netherlands and Denmark.

Walking Away: This prevention programme has generated substantial national and international interest and has been commissioned and implemented across diverse primary care organisations in England, Gibraltar, Ireland and Australia. To date, 66 educators have been trained to deliver the programme (59 in UK and Ireland, 5 in Australia, and 2 in Gibraltar).

Audit data and interviews with stakeholders have confirmed that the programme promotes improved health behaviour in routine clinical care and is widely appreciated by participants and healthcare professionals alike. Walking Away continues to attract new implementation sites nationally. The implementation of the programme has been achieved at a very low cost; one site estimated the total cost to be £30 per patient per course (results presented at the Diabetes UK professional conference 2011, London).

Notable awards

Davies was awarded a prestigious NIHR Senior Investigator status in 2009 and this was renewed to the maximum term in 2012.

The implementation of Walking Away in routine care won the Health Foundation prize for the best contribution to improvement in science at the 2011 'Delivering better health services' conference, Liverpool and was awarded silver at the national Quality In Care (QIC) Diabetes Awards 2011.

Research around Walking Away led to a rising star award for Yates from Primary Care Diabetes Europe, Barcelona, 2012.

5. Sources to corroborate the impact

A. NICE: Diabetes in adults. Quality Standards, QS6 - Issued: March 2011. http://www.nice.org.uk/guidance/qualitystandards/diabetesinadults/diabetesinadultsqualitystandard.jsp
B. NICE: Preventing type 2 diabetes - risk identification and interventions for individuals at high risk http://www.nice.org.uk/PH38
C. NICE: Shared learning implementing NICE guidance. http://www.nice.org.uk/usingguidance/sharedlearningimplementingniceguidance/examplesofimplementation/eximpresults.jsp?o=578
D. National service frameworks and strategies: Standards for diabetes. http://www.nhs.uk/nhsengland/NSF/pages/Diabetes.aspx
E. Head, UK National Screening Committee/NHS Screening Programmes
F. Davies M, Khunti K and Yates T. (contribution to chapters 5, 6, 7, 12) Diabetes UK and South Asian Health Foundation recommendations on diabetes research priorities for British South Asians. 2009. http://www.diabetes.org.uk/upload/Reports/South_Asian_report.pdf
G. Wass JAH, Stewart P, Amiel SA, Davies MJ. Oxford Textbook of Endocrinology and Diabetes. Oxford Textbook of Endocrinology and Diabetes, 2011, 2nd Edition
H. Yates T, Davies M, Troughton J, Daley H, Martin-Stacey L, Khunti K, 2010. "Walking Away from Type 2 Diabetes: development of a diabetes prevention programme for implementation within England" in Diabetes Prevention in Practice. TUMAIMI institute for Prevention Management, Dresden, Germany.
I. Schwarz P, Greaves C, Lindstrom J, Yates T, Davies M. Non-pharmacological intervention for diabetes mellitus prevention in populations: Where do we stand? Nat Rev Endocrinol. 2012; 8:363-73.
J. Crasto W, Jarvis J, Khunti K, Skinner TC, Gray LJ, Brela J, Troughton J, Daly H, Lawrence IG, McNally PG, Carey ME, Davies MJ. Multifactorial intervention in individuals with type 2 diabetes and microalbuminuria: The Microalbuminuria Education and Medication Optimisation (MEMO) study. Diabetes Research and Clinical Practice 2011; 93:328-36.
K. Head, NHS Leicester City Clinical Commissioning Group.
L. Stone M, Patel N, Daly H, Martin-Stacey L, Sayjal A, Marian M, Khunti K & Davies M. Using qualitative research methods to inform the development of a modified version of a patient education module for non-English speakers with type 2 diabetes: action research project on two south Asian populations in the UK. Diversity in Health and Social Care 2008;3:199-206