

Diabetes Prevention, Peer-Led
Education and Self-Management
Programmes (DIMPLE): an Impact
Evaluation of the Champions Project

Master of Public Health

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Abbreviations

| | |
|--------|--|
| BME | Black and Minority Ethnic Groups |
| CDSMP | Chronic Disease Self-Management Programme |
| CCG | Clinical Commissioning Groups |
| CLAHRC | Collaboration for Leadership in Applied Health Research and Care |
| GP | General Practitioner |
| IFG | Impaired Fasting Glycaemia |
| IGT | Impaired Glucose Tolerance |
| MeSH | Medical Subject Headings |
| NHS | National Health Service |
| NICE | National Institute for Health and Clinical Excellence |
| NIHR | National Institute for Health Research |
| NWL | North-West London |
| NSF | National Service Framework |
| PDSA | Plan-Do-Study-Act |
| PCT | Primary Care Trust |
| QI | Quality Improvement |
| QIPP | Quality, Innovation, Productivity, Prevention |
| QOF | Quality and Outcomes Framework |
| RCT | Randomised Controlled Trial |
| SROI | Social Return on Investment |
| T2DM | Type 2 Diabetes Mellitus |
| UK | United Kingdom of Great Britain and Northern Ireland |
| WHO | World Health Organization |

Abstract

Background: Diabetes mellitus is a complex condition characterised by high blood glucose concentrations, as a direct result of ineffective uptake mechanisms (type 2) or a lack of insulin production (type 1) within the body. The United Kingdom (UK) prevalence of diabetes increased from 1.6 million in 1996 to 2.9 million in 2011; in addition, an estimated 850,000 cases remain undiagnosed. This is of great concern due to the quiescent nature of complications associated with diabetes; around 50% have some form of macro or micro-vascular complication at the point of diagnosis. Thus, it is of paramount importance that initiatives exist to assist in the prevention and detection of diabetes at an earlier stage.

Objectives: The objectives of this study were to assess the impact of the Diabetes Management and Peer-led Education (DIMPLE) Champions project on the Champions themselves as well as the members of the public that attend the events. Additionally, the financial and social value of a peer-led diabetes awareness and health promotion initiative would be determined.

Methods: Two questionnaires were designed, piloted and implemented; one for the Diabetes Champions and the other for the Public Event Attendees. Two focus groups were held, which were transcribed verbatim and analysed via thematic analysis. The top four themes identified from the Champions and the Public Event Attendees focus groups were described. To assess the financial viability and social value created by the project, a Social Return on Investment analysis was undertaken.

Results: Over 80% of Champions reported increases in self-confidence, social skills and knowledge of diabetes whereas over 90% of Public Event Attendees reported increases in knowledge regarding risk factors for and symptoms of diabetes. The Social Return on Investment estimates that for every £1 spent on the project, a total of £11.36 was created in social value, giving a net estimated return of £1,390,716.

Conclusions: Champions and Public Event Attendees were positive with regard to the effect the project had on their lives. Changes in health related behaviours were evident. In addition, preventive initiatives such as the DIMPLE Champions project have the potential to bring about long-term savings to NHS and wider society via increased detection of diabetes.

1.1.0. Introduction

1.1.1. Pathophysiology of Diabetes

Diabetes is a complex metabolic disorder and can manifest as one of two types.

Pathophysiological characteristics of either deficient insulin production by the pancreas (Type I) or the ineffective use of insulin by the body (Type II) are evident (Diabetes UK, 2012). Type II diabetes mellitus (T2DM) is the greatest burden to public health, accounting for around 90% of all diabetes in the UK (WHO, 2011). It is mainly diagnosed in adults above 40 years of age and is largely preventable (reference). Type I diabetes, on the other hand, accounts for the remaining 10% of cases and has genetic, autoimmune and lifestyle components (Atkinson and Eisenbarth, 2001).

The Royal College of Physicians set out criteria for diagnosis of diabetes made during a fasting plasma glucose test, with a value of 7.0 mmol/L conferring diabetes (reference). Alternatively, a random plasma glucose recording of equal to or greater than 11.1 mmol/L confers a diagnosis of diabetes (National Collaborating Centre for Chronic Conditions, 2008). A blood test to measure glycated haemoglobin (HbA1C) concentrations can diagnose diabetes; with a value of 7.5% or greater warranting a diagnosis (International Diabetes Federation, 2009).

Pre-diabetes, known as impaired fasting glucose (IFG) or impaired glucose tolerance (IGT), depending on which test is used, is a condition in which blood glucose concentrations are consistently above the normal threshold yet below the value that is concordant with clinical diabetes (National Collaborating Centre for Chronic Conditions, 2008). Individuals classified as having pre-diabetes have a 50% risk of developing full T2DM within 10 years (Nichols, Hillier and Brown, 2007).

1.1.2. Global Epidemiology of Diabetes

An estimated 346 million people are afflicted with diabetes worldwide (World Health Organization, 2011). This represents a two-fold increase in prevalence since 1980 that is projected to increase exponentially in the next twenty years (Ezzati *et al.*, 2011). Diabetes, cancer, chronic respiratory diseases and cardiovascular disease form the quadrant of

conditions that account for over 60% of deaths worldwide (World Health Organization, 2008). In the next 50 years, diabetes is projected to provide England’s National Health Service (NHS) with the greatest clinical and financial challenge of all medical conditions (Bagust *et al.*, 2002). This can be ascribed to the future expansion of the UK population, particularly among those aged 50 years and above, and the increase in unhealthy lifestyles (Ezzati *et al.*, 2011).

Table 1. Modifiable and non-modifiable risk-factors associated with type II diabetes mellitus.

| Modifiable | Non-Modifiable |
|---|-----------------------------|
| Overweight (Body Mass Index >25 kg/m ²) | Ethnicity |
| Obesity (Body Mass Index >30 kg/m ²) | Family History |
| Physical Inactivity | Age |
| Impaired Fasting Glucose | Gender |
| Impaired Glucose Tolerance | Prior Gestational Diabetes |
| | Polycystic Ovarian Syndrome |
| Metabolic Syndrome (Hypertension, Triglycerides) | |
| Dietary Factors | |
| Inflammation | |
| Intra-uterine Environment | |

T2DM is more common in those aged over 40-years old (Fowler, 2008). An ethnic disparity is evident for T2DM; the condition is three fold higher in Black and Afro-Caribbean individuals and six-fold higher in South Asians when compared with a Caucasian population (Soljak *et al.*, 2007). Furthermore, women are at greater predisposition to men (Ezzati *et al.*, 2011).

A positive linear relationship exists between diabetes and deprivation, with the most deprived areas of the UK and other countries having the highest prevalence of the disease (Evans *et al.*, 2000 and Espelt *et al.*, 2011). T2DM is a polygenic disorder, with numerous loci being identified in genome-wide association studies as conferring an increased risk of the condition (Wheeler and Barroso, 2011). The aforementioned risk factors and others are summarised in Table 1.

1.1.3. Diabetes in the United Kingdom

The network of Public Health Observatories has produced a Diabetes Prevalence Model which provides estimates of both diagnosed and undiagnosed diabetes throughout the UK (YHPHO, 2012); key values are presented in Figure 1, showing the demographic differences in prevalence. It is estimated that a total of 3.25 million people aged 16 years and above have diabetes in the UK, equivalent to 7.6% of the total population (YHPHO, 2012). Within this model, the London boroughs of Harrow and

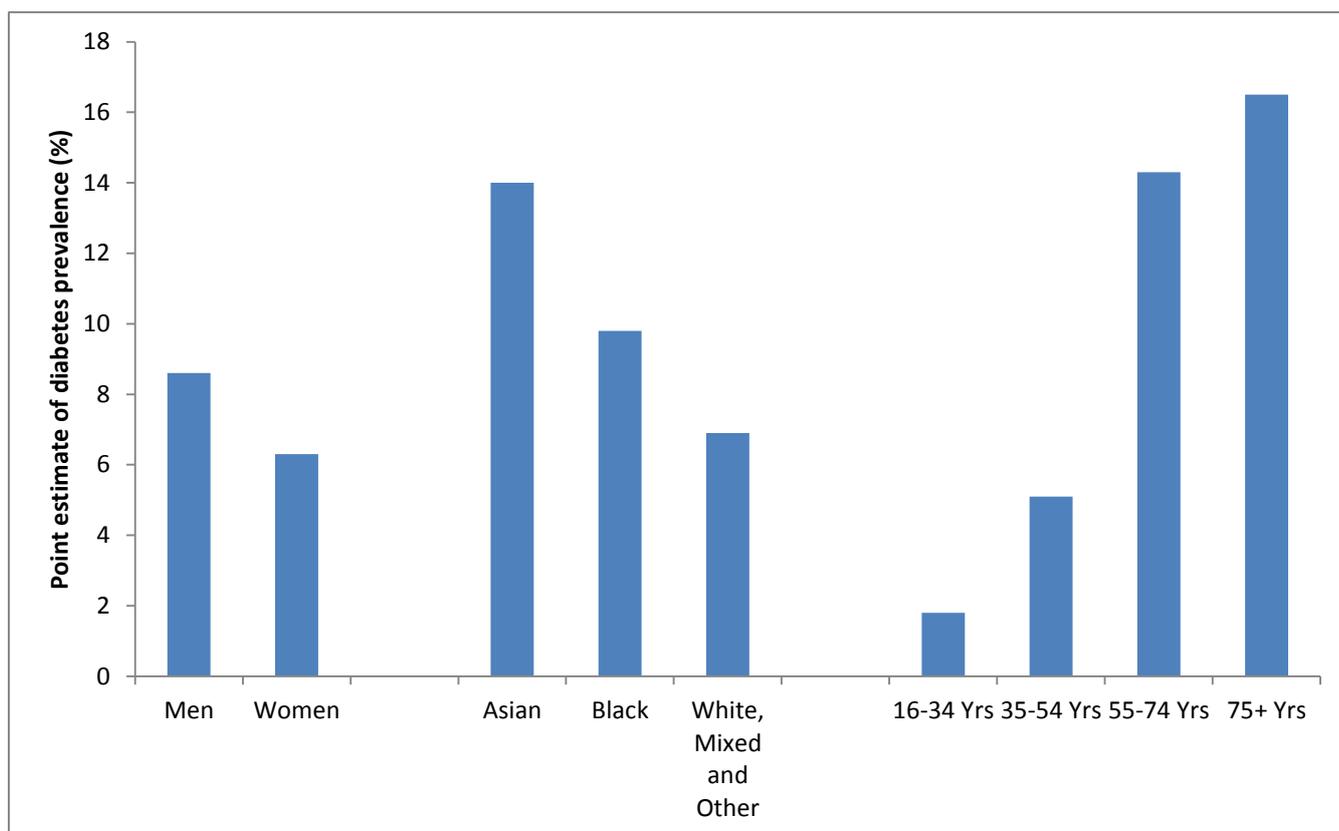


Figure 1. Prevalence of diabetes in the UK according to gender, ethnicity and age (adapted from the Association of Public Health Observatories statistics, 2009).

Westminster are estimated to have a diabetes prevalence of 10% and 6.5% respectively, that is projected to rise to 13.9% and 8.7% by 2030, respectively (YHPHO, 2012).

Additionally, both Harrow and Westminster Primary Care Trusts (PCTs) are included in the top 10 PCTs in England predicted to experience the greatest estimated percentage increase in diabetes prevalence within the UK (YHPHO, 2012). At present, a total of 7.7% of England's Gross Domestic Product (GDP) is spent on healthcare within the NHS. In addition

to the direct medical costs of treating diabetes, social and productivity costs provide further cost outlays via the increased morbidity and mortality that accompanies diabetes. The cost of diabetes care is expected to reach £16.9 billion pounds by 2035 (Hex *et al.*, 2012).

The Quality, Innovation, Productivity, Prevention (QIPP) programme was initiated in 2010 and aims to deliver £20 billion in savings by 2015 (NHS, 2012). A growing demand now exists for more cost-effective medical care and public health interventions.

1.1.4. Complications of Diabetes

In people with diabetes, various complications can arise due to poor disease management, poor lifestyle, or both. These can be grouped into micro-vascular and macro-vascular complications. The main trio of micro-vascular complications are neuropathy, nephropathy and retinopathy (Fowler, 2008).

Neuropathy refers to a range of nerve disorders caused by diabetes. Associated complications include distorted sense of sensation in limbs, pain throughout various parts of the body and impotence (Callaghan *et al.*, 2012). Over 50% of diabetics who have had the condition for over 25 years will experience neuropathy as a complication (World Health Organization, 2004). Neuropathy can give rise to additional complications such as diabetic foot, a leading cause of amputation among diabetic patients (Boulton *et al.*, 2005).

Diabetic nephropathy is the most common cause of end-stage renal disease in Europe and the United States of America (American Diabetes Association, 2004). It is widespread in those with poorly controlled diabetes or individuals who have remained undiagnosed for many years. The other micro-vascular complication, diabetic retinopathy, is a leading cause of ophthalmic problems and blindness in the UK (Thomas *et al.*, 2012).

Macro-vascular complications of diabetes predominantly manifest as the development of atherosclerotic lesions within arteries, leading to cardiovascular disease. Thus, diabetes is a risk factor of both obesity and coronary heart disease (Fowler, 2008).

The onset of the aforementioned complications is evident in around 50% of those newly diagnosed with T2DM in the UK (International Diabetes Federation, 2009). Consequently,

any prevention methods which yield an earlier diagnosis of diabetes are of a significant benefit to public health.

1.1.5. The Need for Preventive Strategies

In the NHS Diabetes National Service Framework (NSF), the prevention of people at risk of diabetes and the identification of people with diabetes comprise two of the twelve standards (Department of Health, 2001).

The UK Prospective Diabetes Study found that a change in lifestyle patterns, such as adopting a low-fat, high fibre diet and exercising, could lead to the reversal of the IFG state and thus reduce the risk of developing T2DM (Turner, 1998). The longevity of lifestyle changes in preventing onset of diabetes has been shown in the China Da Qing Diabetes Prevention Study; a lower incidence of diabetes occurrence in the intervention groups (7%) than the control group (11%) was observed, further reiterating the importance of lifestyle intervention in the primary prevention of T2DM (Li *et al.*, 2008).

In the Finnish Diabetes Prevention Study, an intensive lifestyle modification programme yielded long-term changes in participants' physical activity levels and diets as well as biochemical and clinical measurements (Tuomilehto *et al.*, 2001). This re-inforced the message of previous studies, which highlighted that non-pharmacological methods of lifestyle modification are efficacious and cost-effective in reducing diabetes risk.

1.1.6. Quality Improvement in Diabetes Management and Patient Care

Figure 2 outlines the three domains within which Quality Improvement (QI) can be used in diabetes care. QI that targets healthcare systems can consist of continuous QI, via the use of plan-do-study-act (PDSA) cycles, which involves a continuous process of assessing problems concerning diabetes care and patient management, formulating solutions to these problems, testing the impact of such solutions and finally assessing the need for additional action.

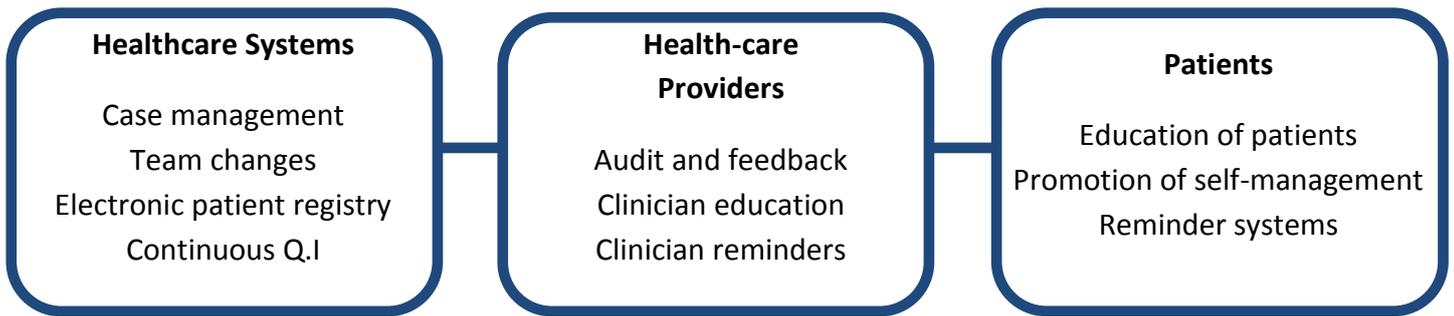


Figure 2. Quality improvement strategies in diabetes management and education.

Diabetes care can be improved via targeted QI for health-care professionals. This can be via a National Diabetes Audit; collecting information from GPs and hospitals to compare process and outcome data with national standards (NHS, 2012). Improved education concerning diabetes clinical care or guidelines via seminars, workshops or conferences can lead to QI. The use of technology to act as prompts and provide reminders concerning health information of patients (*i.e.* most recent glycated haemoglobin value) or referral for specific tests (*i.e.* foot screening or retinopathy screen) can lead to improvements in care. Financial incentives such as pay for performance, reimbursement and the quality and outcome framework (QOF) are other examples of health-care provider targeted QI.

Finally, and of most relevance to this paper, is the role of patients in delivering quality improvement in diabetes care and self-management. Such quality improvements include the provision of education to patients, with the most successful programmes being Dose Adjustment for Normal Eating (DAFNE, for type I diabetes) and X-PERT (for T2DM). The promotion of self-management is another example of patient targeted quality improvement. As diabetes is a lifelong condition, patients require the ability to reduce their risk of complications as much as possible. Both education and self-management is vital to achieve this. The evidence base on patient education and self-management programmes as well as health promotion and primary prevention initiatives will be analysed in more detail as part of the literature review (section 1.2.1.).

1.1.7. Study Context, Aims and Objectives

The National Institute for Health Research (NIHR) Collaboration for Leadership in Applied Health Research and Care (CLAHRC) for North-West London (NWL) is working in partnership with Diabetes UK, Hammersmith and Fulham (H&F) PCT and Harrow PCT in order to deliver a range of diabetes management and peer-led education programmes under the acronym of DIMPLE. The project was launched in April 2011 and consists of three volunteer programmes entitled Peer Educators, Diabetes Mentors and Diabetes Champions.

Peer Educators co-facilitate X-PERT courses held within H&F and Harrow and teach their diabetic peers in parallel with health professionals. Diabetes Mentors are positioned within GP surgeries throughout the borough and provide guidance, support and advice to individuals living with diabetes.

Diabetes Champions are members of the community who either currently have diabetes, have a family member or friend with diabetes, or have a keen interest in informing and educating others about the condition. They act to raise awareness of diabetes in their local communities. This is achieved via educating the public about diabetes, the risk factors associated with the condition, its symptoms, how to reduce risk. Additionally, the range of local health services available to test for diabetes and support groups for people with diabetes is highlighted.

To obtain relevant process measures and regularly review the progression of the project, CLAHRC NWL developed a bespoke web based platform for quality improvement. Recorded on this platform for the period April 2011 to July 2012, a total of 155 Diabetes Awareness Events were organised and held by Diabetes Champions in a range of community locations. These have included religious buildings, local community centres, coffee mornings and health fairs. Four thousand one hundred and twenty-nine individuals were estimated to have attended Diabetes Awareness Events, up to the end of July 2012 (CLAHRC NWL, 2012).

Diabetes Champions are recruited from a diverse background; an average of 70% attendees were from Black Minority Ethnic (BME) groups and 32 community groups from a wide range of ethnicities have been involved with the programme. This increases the accessibility and potential for the programme to be a success, given the fact that many the most vulnerable

groups predisposed to diabetes speak little or no English, are in deprived communities and rarely use mainstream primary care services (Greenhalgh, Collard and Begum, 2005).

DIMPLE Diabetes Champions undergo a two-day training regimen organised by Diabetes UK and attend a further day of diabetes awareness before commencing their role.

It is important to ascertain what happens to individuals who attend Diabetes Awareness Events; namely, whether or not changes in health attitudes, beliefs and behaviours occur with regard to diabetes and lifestyle.

The primary aim of this study was to conduct an impact evaluation of the Champions arm of the DIMPLE project. This evaluation consists of four stages:

- 1) Literature Review: a theoretical analysis of peer-led education and self-management and health promotion in diabetes, summarising available research evidence.
- 2) Questionnaire Design and Focus Group recruitment: two questionnaires (for Diabetes Champions and Public Event Attendees) are designed and piloted. Topic and probing guides are formulated for telephone interviews and focus groups.
- 3) Impact Evaluation: collating and analysing data from the questionnaires, telephone interviews and focus groups via thematic analysis and descriptive statistics to assess the impact of the Champions Project.
- 4) Social Return on Investment (SROI): an economic SROI analysis estimates the value that the DIMPLE Diabetes Champions project creates.

1.2.0. Literature Review

1.2.1. Search Strategy

The databases of PubMed, OvidSP, Web of Science and the Cochrane Collaboration of Systematic Reviews were used to conduct the search. Reference lists were also hand searched to capture articles not highlighted by the primary literature search. Medical Subject Headings (MeSH) were used (Table 2) as well as various manual search terms appertaining to the patient, intervention and outcome (Table 3). In addition, relevant websites were perused to obtain factual data on diabetes and its prevalence. These websites included Diabetes UK, the Kings Fund, the World Health Organization, the NHS Information Centre, NHS Diabetes and the International Diabetes Federation. Inclusion criteria were that articles were written in English and had been published within the last 20 years.

Table 2. Medical Subject Heading [MeSH] terms used in literature search

| Peer/Lay | Education | Self-management | Diabetes/LTCs |
|------------------|-----------------------|------------------|--------------------------|
| peer group[MeSH] | education [MeSH] | self-care [MeSH] | diabetes mellitus [MeSH] |
| | social support [MeSH] | | chronic disease [MeSH] |

Table 3. Terms used in the literature search

| Patient | Intervention (1) | Intervention (2) | Outcome |
|----------------------|--------------------|------------------|-------------|
| long-term condition* | peer* | education | self care |
| long term condition* | lay* | support | self-care |
| diabetes | health worker* | | self manag* |
| | primary prevention | health promotion | self-manag* |

1.2.2. Peer-led Education, Self-Management and Primary Prevention

The World Health Organization (2008) has defined peer-led education as the processes by which individuals that have diabetes, or have been affected by the condition (i.e. via family or friends), engage with fellow diabetes patients or members of the public and deliver health information and support.

The Chronic Disease Self-Management Program (CDSMP) was developed at Stanford University (Lorig *et al.*, 1999). In the CDSMP, individuals with a specific chronic disease (*i.e.* arthritis or diabetes) are trained as peer-advisors and are responsible for the delivery of information to fellow sufferers, including symptom management, exercise, nutrition and communication with healthcare professionals. Improvements in outcome variables at 6-month follow-up were observed in the intervention group in comparison to the control group (Lorig *et al.*, 2009).

In 2001, the NHS published 'The Expert Patient', emphasising the role of the patient in chronic disease management as knowledgeable and useful adjuncts to traditional medical care (Department of Health, 2001). This led to the formulation of the UK's equivalent of the CDSMP: the Expert Patient Programme, which has provided self-management courses for a wide range of chronic diseases, including diabetes (Donaldson, 2003).

The King's Fund recently showed the need for the NHS to re-orient its health service priorities away from acute and episodic treatment of illness to the prevention of chronic disease. Active support for self-management of chronic diseases and improved primary prevention of chronic conditions such as diabetes were two of the top ten priorities highlighted for investment by commissioners (Kings Fund, 2012).

The University of East Anglia developed an Impaired Fasting Glycaemia Programme. This involves lay members of the public who have diabetes being trained to provide motivational phone calls to members of the public who were considered high risk for future development of diabetes. It was shown that such a peer-led diabetes prevention programme was viable and more cost-effective than using healthcare workers in a motivational health promoting capacity (Murray *et al.*, 2012).

One report has suggested that there are four key domains in which diabetes education and self-management programmes should be evaluated with regard to effectiveness; these are knowledge and understanding, self-management, self-determination and psychological adjustment (Egenmann and Colagiuri, 2007).

In a meta-analysis of quality of life (QOL) outcomes after self-management training, Cochran and Conn (2008) found statistically significant differences between control and intervention groups; those that underwent self-management courses experienced an increase in QOL whereas the control group had no change.

The National Institute for Health and Clinical Excellence (NICE) asserts that the successful implementation of patient education programmes in the management of T2DM is subject to adequate training programmes and staff numbers being available (NICE, 2012). Such training and an increase in staff numbers would bear a significant additional cost to NHS resources. This is where peer-led volunteer programmes can be advantageous (Foster *et al.*, 2009).

Tricco *et al.* (2012) found that if baseline glycated haemoglobin (HbA1C) is greater than 8.0%, the patient education strategy has the greatest effect, with more modest improvements being observed in patients with HbA1C values below 8.0%. Thus, targeted education referral for patients with HbA1C value > 8.0% could be most efficacious, to save costs for the NHS.

Deakin *et al.* (2006) initiated the 'X-PERT' programme, to educate people with T2DM, via a six week training course. This covers tips on eating, physical activity, what diabetes is and how it can be managed better. A recent review has found X-PERT leads to increases in confidence, healthy eating, physical activity, blood glucose control and a lower requirement for diabetes medication. Further, in a systematic review of lifestyle modification interventions in diabetic patients, the X-PERT programme was considered most likely to be cost-effective (Jacobs-Van Der Bruggen *et al.*, 2009).

Kennedy *et al.* (2008) found that a peer-led self-care support programme improved health related quality of life, with increases in self-efficacy and self-reported energy being observed.

Conversely, a randomized controlled trial (RCT) of peer support in patients with T2DM in GP surgeries in the Republic of Ireland found no difference in biophysical or psychosocial outcomes between the intervention and control groups; concluding that universal adoption of peer-support and the scope for it having beneficial effects upon patient management is limited (Smith *et al.*, 2011). More research is required to elucidate whether a targeted approach, involving patients with poorly controlled diabetes at high risk of complications, would be the best approach for healthcare providers (Alberti, Zimmet and Shaw, 2007).

Dose Adjustment for Normal Eating (DAFNE) is an educational programme for the management of type I diabetes. A recent systematic review into the effectiveness of the DAFNE programme found that both glycated haemoglobin and quality of life were significantly improved in all of the intervention settings using DAFNE (Owen and Woodward, 2012). However, paucity exists regarding the long-term effectiveness of the programme, and thus more research is needed to assess this (Funnell, 2010).

Khunti *et al.* (2012) reviewed the effectiveness of the Diabetes Education and Self-management for On-going and Newly Diagnosed (DESMOND) programme and found that changes in both lifestyle and biomedical outcomes at one year post-intervention were not sustained at year three of follow-up. However, four out of the five illness beliefs of participants (seriousness, personal responsibility, timeline and coherence) were sustained, although this finding does question the long-term effectiveness of diabetes education models.

CLAHRC NWL is one of nine NIHR funded centres around the UK. Some other centres have also developed T2DM primary prevention programmes that are currently under implementation and evaluation. CLAHRC Leicestershire, Northamptonshire and Rutland (2011) are conducting a cluster RCT to investigate the effect of structured education on walking in individuals at high risk of developing type II diabetes. CLAHRC Greater Manchester (2011) has also implemented evidence-based preventive lifestyle changes for primary care patients who are at greater risk of developing T2DM in the future. This consisted of health trainers delivering face to face or telephone lifestyle support for a period of six months to high-risk patients. Improvements in a range of clinical outcome measures were found, including reductions in mean waist circumference and weight. CLAHRC for

Birmingham and Black Country are conducting an evaluation on the 'Chronic Disease Educator' self-management programme for individuals with diabetes and other common chronic conditions (Sidhu, Gale and Jolly, 2012).

In a RCT to assess the effectiveness of using peer advisors compared with specialist health professionals in the delivery of diabetes self-management training, specialist health professionals and peer advisors were equally as efficacious at educating peers, with knowledge diabetes and the importance of a healthy lifestyle encompassing good nutrition, regular exercise and medication compliance being improved post-intervention (Baksi *et al.*, 2008).

In an era of increasing economic uncertainty and financial austerity, the mantra of value is continually asserted in the NHS. In particular, new medicines and interventions have to be cost-effective. NICE have recommended patient education models in both the prevention and treatment of T2DM (NICE, 2012).

2.0. Methods

2.1. Study Design

This is a qualitative study that aims to assess the impact of the Diabetes Champions work of the DIMPLE project.

2.2. Study Population

The DIMPLE Champions project was carried out in NWL, as a partnership between CLAHRC NWL, Hammersmith and Fulham PCT, Harrow PCT and Diabetes UK. The impact of the project on both the Diabetes Champions themselves and the public with whom they interact (be it a short conversation or a presentation) were assessed. For the Diabetes Champions, changes in confidence managing diabetes (if diabetic), professional skillset and social skills were assessed, as well as those aspects that the Public Event Attendees were assessed; namely, changes in knowledge of diabetes, its symptoms, signs and risk factors, sources of help and support, diabetes testing locations eating habits, exercise frequency and type, self-confidence and psychological wellbeing.

2.3. Literature Search Strategy

The literature search strategy methodology is detailed in section 1.2.1.

2.4. Questionnaire Design

Two questionnaires were designed for use; one for the Diabetes Champion Volunteers (named the Champions Volunteer Questionnaire) and another for general members of the public (named the Diabetes Public Event Attendees Questionnaire). Particular attention was given to simple use of language in each questionnaire, such that a lay person could easily understand and complete them. Questions were designed not to be leading and the researcher ensured that the range of potential answers were all inclusive and not limiting (Payne, 1951). Each was produced in draft format, using Microsoft Word, by the researcher, and proof read by two members of the public health team at Inner North-West London (INWL) PCT. After subsequent grammatical corrections, the questionnaire software 'Survey Monkey (2012)' was used to produce an online version of both questionnaires (Appendix I

and II). They were subsequently piloted with two Diabetes Champions and four Public Event Attendees completing their respective questionnaires. No problems were evident in either piloting.

2.5. Recruitment of Participants

Participants were recruited by a number of Diabetes Champions at Diabetes Awareness Events held within the Boroughs of H&F and Harrow, between 01 July and 01 August 2012. A contact details template, produced by the researcher (Appendix III), was used in recruiting participants and included a brief statement concerning the purpose of the evaluation, with space for the Diabetes Champion to record the event, location, date and contact details (name, telephone and e-mail) of the Public Event Attendees who agreed to be contacted.

All Diabetes Champions were e-mailed an online link to the questionnaire, to answer via self-completion. Public Event Attendees had the choice of contact via e-mail or telephone. Those who opted for e-mail completed the questionnaire themselves online whereas those who opted for telephone were called by the researcher. Telephone calls were recorded to listen back and limit bias when delivering questions and for use as a potential source of qualitative data. A period of 14 days was given between a Diabetes Awareness Event and subsequent contact with Public Event Attendees. An e-mail containing the online questionnaire link was sent to participants 14 days after the event. Telephone calling was carried out as close as possible to the 14 day mark post-event, but for some participants, this varied between 14 and 28 days, due to phone-call attempts not being answered.

2.6. Focus Groups

In addition to the questionnaires, two focus groups were conducted; one with Diabetes Champions and one with Public Event Attendees. Each focus group contained a total of 8 people; the recommended number to gain a diverse range of views, to encourage participation between attendees and to avoid precluding quieter individuals (Lacey and Luff, 2007). For the Diabetes Champions focus group, purposive sampling was used to recruit Champions who had held most events and were considered more willing and able to contribute to a group discussion.

Purposive sampling is also known as theoretical sampling and is often used as a method of avoiding selection bias in qualitative research (Mays and Pope, 1995). This was expected to have the advantage of gathering a homogeneous focus group, with each member contributing a wide range of views in an open and frictionless environment. The main purpose of the focus group was to gain depth in response, rather than achieve representation of the whole population of H&F and Harrow Public Event Attendees. Convenience sampling was used to recruit participants for the Public Event Attendee focus group. This was done at the end of a Diabetes Awareness Event held within a regular coffee morning at Askew Road, Hammersmith; individuals in attendance were invited back to a focus group 2-3 weeks later. When the sample of 8 was full, recruitment stopped.

Both focus groups followed the same structure, with an introduction, a welcome to those attending, explanation of ground rules, a warm up task followed by the main question session. A set of topics for discussion was produced by the researcher (Appendix IV). The focus group guide produced by the National Institute for Health Research was drawn upon (Lacey and Luff, 2007). Each focus group was recorded on a Dictaphone for analysis.

2.7. Descriptive Statistical Analysis

Descriptive statistics were used to arrange and display data from each of the questionnaires, in the form of simple counts, percentages, ratios and cross tabulations of both demographic and main variables.

2.8. Qualitative Data Analysis

Within healthcare and public health research, qualitative methods have achieved renewed prominence since the definition of quality within the NHS and public health systems was modified to include the opinion of the lay-person (NHS, 2000). Multiple sources of data were collected in this study, combining quantitative techniques (*i.e.* questionnaires) with qualitative techniques (*i.e.* recorded telephone completion questionnaires and focus groups). The combination of data collection methods is termed methodological triangulation (Cohen and Manion, 2000). It is widely accepted to increase the internal validity of a study (Jick, 1979; Malterud, 2001; Mayrick, 2006). The ideology is that if similar

conclusions are drawn from data collected using numerous sources; the likelihood of those conclusions is increased (Black, 1994).

Thematic Analysis was used to identify repeated patterns of meaning when listening to the focus group recordings, and followed this schedule:

- 1) Development of theoretically driven initial codes

Potential codes were formulated based upon the outcomes postulated by the researcher and the public health behaviour change team at INWL PCT.

- 2) Familiarisation with the data and development data driven codes

The focus group recordings were transcribed verbatim; participants were identified as 'P1, P2...Pn' and codes were assigned to various parts of the text. Repeated listening to the focus group recordings and reading of the transcriptions was carried out by the researcher.

- 3) Connection of codes and themes across the data

Codes were connected and grouped into themes. The top four occurring themes from each focus group are reported, in a narrative format and via the use of direct quotes.

2.9. Social Return on Investment Methodology

In many areas of healthcare investment, providers expect to see a full return on their financial investment within a relatively short period of time. Such a return is often only considered in monetary terms. However, primary prevention, peer-led education and health promotion programmes such as the DIMPLE Champions project deliver benefits that go far beyond tools used in traditional health economics.

SROI is a method that permits measurement of the social impact that health interventions have on their target population as well as the wider environment in general. Consequently, it was considered of significant pertinence to carry out a simplified SROI for the DIMPLE Champions project.

The SROI Guide, produced in collaboration with the UK Government Cabinet Office, was followed throughout this analysis (The SROI Network, 2012).

The Social Return on Investment (SROI) analysis in this report comprised a total of 6 stages, as per Table 4.

Table 4. The six stages encompassing a Social Return on Investment analysis

| | |
|---|--|
| <p><i>Stage 1</i></p> <p><i>Establishing scope and identifying key stakeholders</i></p> | <p><i>Stage 4</i></p> <p><i>Establishing impact</i></p> |
| <p><i>Stage 2</i></p> <p><i>Mapping outcomes</i></p> | <p><i>Stage 5</i></p> <p><i>Calculating the Social Return on Investment</i></p> |
| <p><i>Stage 3</i></p> <p><i>Evidencing outcomes and giving them a value</i></p> | <p><i>Stage 6</i></p> <p><i>Reporting, using and embedding the Social Return on Investment</i></p> |

1) Establishing scope and identifying key stakeholders

This stage was carried out within the NHS INWL offices, together with the public health team, other stakeholders and the researcher, and identifies scope for the analysis, thereby framing the outputs.

2) Mapping outcomes

This section was carried out in the form of a collaborative discussion between the researcher and the public health team at INWL PCT. This impact map details where change is postulated to occur and shows the relationship between inputs, outputs and outcomes.

3) Evidencing outcomes and giving them a value

This stage ascertains what the outcomes of the DIMPLE Champions project have been and assigning a value to them. The aforementioned qualitative and quantitative techniques were used to gauge positive and negative impacts of the initiative. A monetary value was assigned to each outcome using various websites, peer-reviewed journals, NHS costing databases and other associated sources (see section 3.3.3).

4) Establishing impact

This stage adjusts for confounding factors that could have affected the outcomes of the DIMPLE Champions Project.

5) Calculating the social return on investment

All of the benefits of the project, in monetary terms, were combined together to reach a 'sum of benefits' calculation. This was then divided by the estimated costs of the project and a SROI value was produced.

6) Reporting, using and embedding

This aspect provides recommendations on how NHS INWL can share the results of the report, disseminate the results to stakeholders and inform commissioners of the value and future potential of the Diabetes Champions project.

2.10. Ethics

The DIMPLE programme is a service improvement initiative not research and as such H&F PCT determined that Ethics Approval is not required. The first page of the online questionnaire detailed the background of the Diabetes Champions project, explained the purpose of its evaluation and informed participants that the information requested throughout the questionnaire would be treated as confidential and is anonymous. The responses were accessed on a password protected internet site (Survey Monkey) and data extracted onto a password protected computer within NHS offices in Central London.

In the focus groups, permission to record was sought by the researcher, and provided by all members present, at the start of the session. Participants were informed that no names would be published or recorded in the analysis stage; instead, they would be referred to as 'Participant *n*' to ensure anonymity. Details regarding data protection, confidentiality and secure storage of information were confirmed with the participants.

3.0. Results

3.1.0 Descriptive Statistics

3.1.1. Diabetes Champions Questionnaire

Fourteen Diabetes Champions attempted the survey, with 12 answering all questions, including in the demographics section (Table 5). There are a total of 20 active Diabetes Champions, so this represents a response rate of 70%. Out of the 14 Diabetes Champions who completed the online survey, 64% [9/14] had a family member with diabetes and 36% [5/14] have T2DM. No respondent had type I diabetes. Only one respondent did not have diabetes and had no family member with the condition.

Five Champions had participated in 5 or more diabetes awareness events, with only 4 Champions yet to have led an event in their community. This was due to their training being completed recently.

Table 5. Characteristics of the Diabetes Champions Questionnaire Respondents

| Gender | | Ethnicity | | Age | |
|--------------|-----------|-----------------|---|-------|---|
| Male | 1 | Black Caribbean | 2 | 18-25 | 1 |
| Female | 11 | Black African | 4 | 26-35 | 0 |
| | | Black British | 1 | 36-49 | 2 |
| | | Caucasian | 3 | 50-64 | 7 |
| | | Mixed Race | 2 | 65-74 | 2 |
| | | | | 75+ | 0 |
| Total | 12 | | | | |

The overarching motive for individuals opting to become Diabetes Champions was that of altruism. Reasons included “wanting to help the community”, “wanting to help other people” and “to be one of a group who help others”. Several Champions identified their desire to reduce the burden of diabetes in their community and to aid in identifying undiagnosed cases. Other factors for involvement included to “give something back to the NHS, after years of treatment and support as a patient” and a family history of diabetes.

Eighty-five percent [11/13] of Champions claimed that their role has affected their own health in a positive manner. Changes included increased exercise uptake, paying more attention to nutritional information when food shopping, eating healthier foods, to avoid saturated fats and a greater sense of responsibility in managing diabetes.

Eighty-three percent [10/12] of Champions were more aware of the signs and symptoms of diabetes since assuming their role whereas 92% [11/12] were more aware of the range of diagnostic and support services available for individuals with diabetes and those who want to know more or be tested for the condition. All Champions identified a GP as the port of call, should diabetes help be required. Other potential sources of help identified included the Diabetes User Group, fellow Diabetes Champions and Diabetes Specialist Nurses.

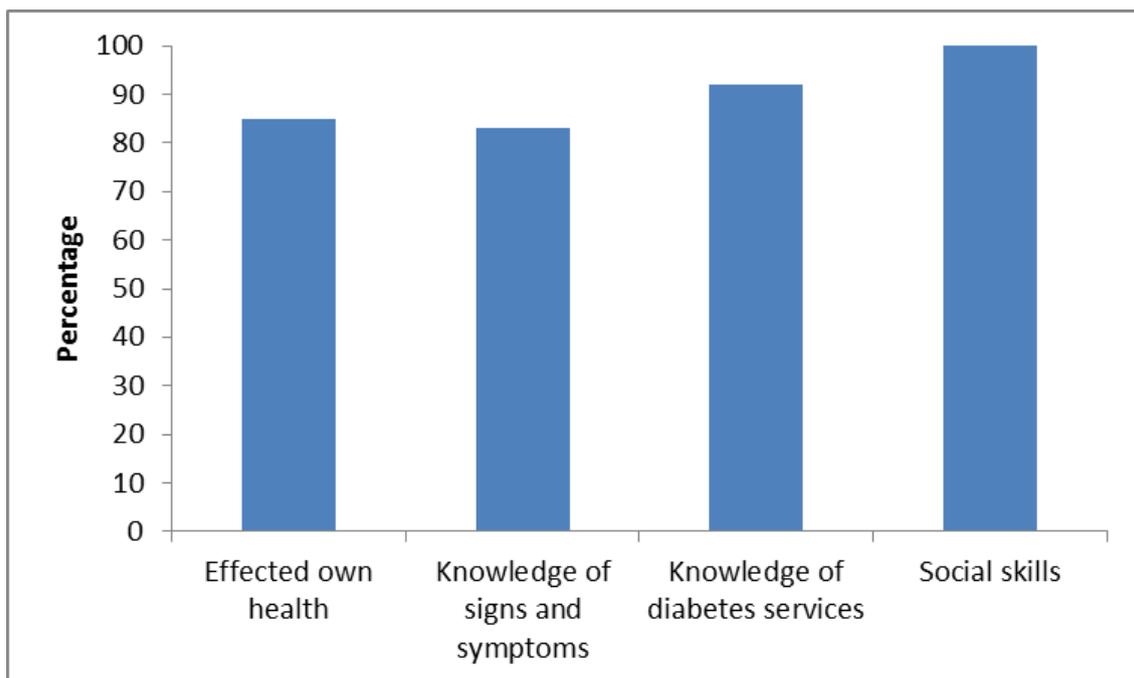


Figure 3. Number of respondents reporting changes in their lifestyle since becoming Diabetes Champions

All Champions [12/12] felt that their social skills had increased as a result of their work, and that they were giving something back to their community. Seventy-five percent [9/12] felt that their professional skills (C.V, employability) had improved whereas 58% [7/12] were confident in managing the diabetes of others. All Champions diagnosed with diabetes [5/5]

felt more confident in managing their own condition on a daily basis. Self-worth was an additional benefit mentioned by 42% [5/12] of Champions.

When asked of any costs of becoming a Diabetes Champion, 58% [7/12] mentioned travel time and distance as a drawback. Financial costs [5/12] and time spent away from family [4/12] were other disadvantages. Around 50% [6/12] of Champions experienced no direct costs as a result of their work. In terms of the importance of being a Diabetes Champion, most [11/12] rated their importance as a score of 8 or more out of 10, with one Champion giving a score of 6.

When asked about changes that could be made to the current Diabetes Champions initiative, 58% [7/12] asserted that the programme had scope for improvement. Namely, a better integration of other local health improvement initiatives, a scaled remuneration system in accordance with Champions performance, a longer training period, a continuous programme of training (with regular updates) and a better structure and organisation of event delivery.

Common topics raised by those in attendance at Diabetes Awareness Events, according to the Champions, include: diet, exercise, questions regarding diabetes symptoms and their respective causes, information availability, where to access 'diabetes tests', and the difference between type I and T2DM.

3.1.2. Public Event Attendees Questionnaire

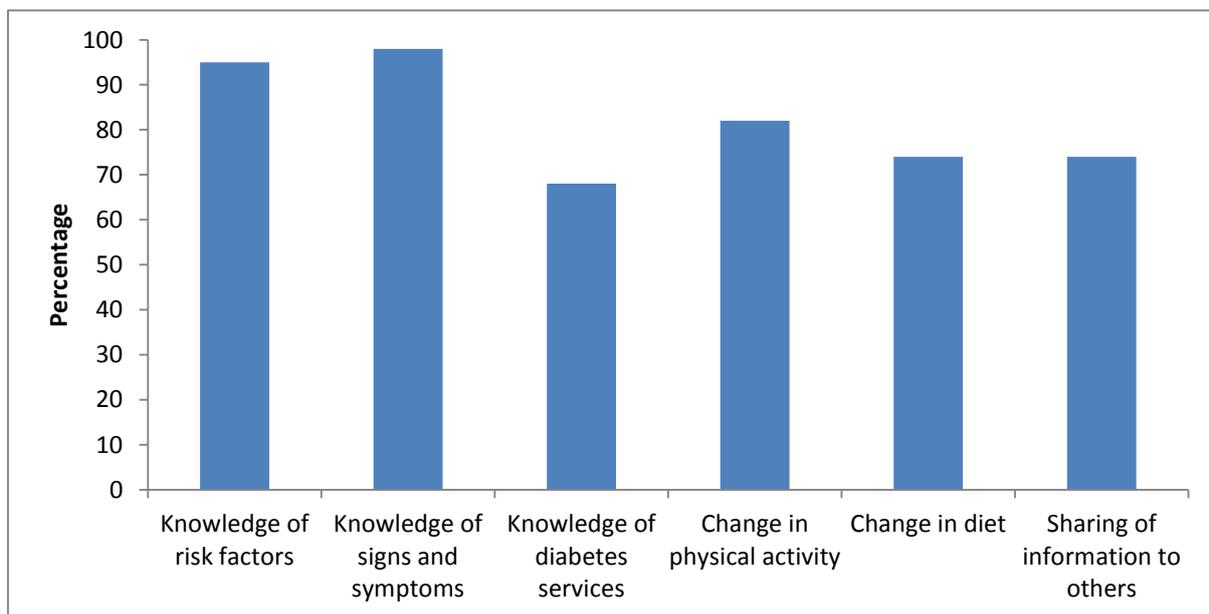


Figure 4. Number of Public Event Attendees reporting changes in various lifestyle measures after attending Diabetes Awareness Events

A total of 41 respondents attempted the questionnaire, with 39 completing all questions including the demographic section (Table 6). Twenty percent [8/41] of respondents who attended the respective diabetes awareness event already had diabetes, whereas 80% [33/41] were negative or undiagnosed. Of those who did have diabetes, all cases were T2DM. Ninety five percent [38/40] of respondents claimed to know more about the causes of diabetes after attending the event. Previous knowledge of diabetes was the reason attributed to those that did not know more after the event. When asked to name three causes of diabetes, most [30/40] could explain that a lack of exercise, an unhealthy diet and too much sugar could lead to the condition. However, some respondents [2/40] listed hypertension as a cause and others [2/40] confused symptoms with causes.

Ninety-eight percent [39/40] of respondents were more aware of the signs and symptoms of diabetes, with the individual who did not report any increase citing previous knowledge as the reason. Thirst and increased urination were two signs and symptoms that most respondents listed.

Table 6. Characteristics of the respondents to the Public Event Attendee Questionnaire

| Gender | | Ethnicity | | Age | |
|--------------|-----------|-----------------|----|-------|----|
| Male | 12 | Black Caribbean | 3 | 18-25 | 3 |
| Female | 27 | Black African | 10 | 26-35 | 0 |
| | | Black British | 2 | 36-49 | 4 |
| | | Caucasian | 6 | 50-64 | 16 |
| | | South Asian | 8 | 65-74 | 10 |
| | | Oriental | 10 | 75+ | 6 |
| Total | 39 | | | | |

Sixty-eight percent [27/40] were more aware of the range of diabetes services available to them within London. Of the 13 respondents that did not report increased awareness of services, this was mainly due to them not being diabetic and thus not paying attention to such information. Previous knowledge was a less common reason.

Seventy-nine percent [31/39] of respondents listed their general practitioner as the port of call, should they have any concerns regarding diabetes. Other less common avenues of support that respondents stated were the pharmacist and the local diabetes support group, all of which were valid sources of advice and support.

Seventy-four percent [29/39] claimed to have shared the information received at the event to others. Points of contact for information sharing were family members, friends, workmates and neighbours.

Seventy-nine percent [31/39] of respondents had not been diagnosed with diabetes prior to attending the event. Eight out of the 31 underwent subsequent testing for diabetes, with one test coming back positive, five negative and two awaiting results. Out of the 23 who had not yet been for a diabetes test, 17 planned to in the near future.

Seventy-four percent [29/39] claimed to have changed their diet since attending the event, whereas 82% [32/39] claim to have become more physically active. Specific dietary changes included cutting down on fats and meat, and eating more fruit and vegetables, whereas changes in physical activity was commonly in the form of walking more frequently.

When asked to rank the importance of the event, 30 out of 39 respondents considered the event as of high importance to them (8 and above, out of 10).

3.2.0. Focus Groups

3.2.1. Diabetes Champions Focus Group:

The details of the Diabetes Champions focus group and the top four themes identified within the transcripts of them are summarised in Table 7 and 8, respectively.

Table 7. Diabetes Champions focus group details

| | |
|--------------|--|
| Location | INWL NHS offices in Marylebone, London |
| Participants | 8 |
| Length | 45 minutes |

Table 8. Top four themes identified in the Diabetes Champions focus group

| Top Four Themes | |
|-----------------------------------|---------------------|
| Diabetes knowledge and management | A community spirit |
| Social networks and support | Professional skills |

Diabetes knowledge and management

Three Diabetes Champions in the focus group had diabetes and all commented on how their confidence in managing their own condition and that of others had improved.

Additionally, one individual had marked improvements in his HbA1C concentrations:

“I definitely feel more confident and in control of my own diabetes; I am feeling the best I have done for years. In my last check-up, my HbA1C has gone down to its lowest value in many years. Whether or not this is a result of being a Diabetes Champion and the changes I have made, I don’t know – but it certainly has helped!” (P2, male).

However, a minority of the group were more cautious and voiced their knowledge boundaries in the role:

“You see, I am not an expert. I am fine with telling people about diabetes but if they want to know detailed stuff, I can’t really tell them that much. I enjoy talking about health issues and hearing people’s stories” (P4, female).

A community spirit

Many of the Champions visibly and audibly expressed their pride at being part of the initiative. Several of them come from deprived areas of London, and are part of BME communities themselves. Thus, *“a chance to help their own people”* was particularly valued:

“I can speak to people in my area in their own language, which I think really makes a difference. Some South Asian communities in London don’t like talking about their personal problems with healthcare professionals, or even white people, due to language barriers” (P7, female).

Social networks and support

The opportunity of forging new friendships with other Diabetes Champions, meeting and interacting with a plethora of individuals at Diabetes Awareness Events and talking to many people were highly valued by the Diabetes Champions. After probing for underlying reasons as to why this was important, two reasons were identified. The first centred on improving the confidence of Diabetes Champions:

*“I have no job and I don’t really get to talk to many people during the week and I get lonely. I now get very excited as I know I will have many people to talk to during my Champions events, and also help people at the same time. Perfect. *laughs out loud*” (P5, female).*

Secondly, gains in self-esteem and confidence were expressed:

“I definitely have a get up and go approach to life now, whereas before I was in the doldrums, so to speak. I was not sure what direction my life was heading but I am much more optimistic now” (P3, female).

Professional skills

The gain in professional skills was evident when ‘other changes’ were discussed in detail with the focus group participants. One young individual plans on entering medical school and is using her role as a Champion to gain first-hand experience of patients. Another had a diploma in social care, and the role of a Champion inspired her to reach new heights and achieve further goals:

“I am going to start my nurse training this September. If it was not for the Champions role, with the confidence and ambition it has given me, I really doubt I would have been motivated to go for it” (P8, female).

Others agreed with nods and comments when asked their opinions on the matter, with some stating *“It definitely is something to add to your CV, and looks good” (P2, male and P6, female).*

3.2.2. Public Event Attendees Focus Group:

The details and top four themes of the Public Event Attendees focus group are summarised in Tables 9 and 10, respectively.

Table 9. Public Event Attendees focus group details

| | |
|--------------|---|
| Location | Askew Road Library in Hammersmith, London |
| Participants | 8 |
| Length | 65 minutes |

Table 10. Top four themes identified in the Public Event Attendee focus group

| Top Four Themes | |
|--|------------------------------|
| Lay understanding of diabetes | Living a “healthy life” |
| Affability of the Diabetes Awareness Event | Dissemination of information |

Two of the 8 in attendance had diabetes before the event and subsequent focus group took place.

Lay understanding of diabetes

There was strong agreement within the group that individuals knew more about the causes of diabetes:

“I feel I am more aware of the role fatty foods and foods with lots of sugar have in making people have diabetes” (P3, female).

“I know that if I eat the wrong foods like fats and sugary stuff too often, I could get diabetes. Having them as treats, not very often, is alright though” (P5, female).

Most stated that eating unhealthy foods containing copious amounts of fats and sugars will increase the risk of diabetes. However, a minority of Public Event Attendees thought that it was primarily a genetic condition, and that if a member of family has the condition, relatives will definitely suffer with diabetes, irrespective of diet:

“If somebodies mother or father has it, the poor child will definitely have it, it doesn’t matter what food it eats” (P2, female).

Living a “healthy life”

All of those present actively voiced their appreciation of the benefits that a healthy lifestyle brings to individuals.

Some Public Event Attendees claimed to have become healthy living advocates, seeking to make positive lifestyle decisions wherever possible:

“The guy who gave the presentation told me about the red lights on the food and to avoid stuff with that on as it is bad for you. I don’t buy nothing like that anymore” (P7, female).

An increased awareness of the importance of physical activity as well as increased uptake was reported:

“I now have a short twenty or thirty minute walk after meal times, in the evenings, which I hope helps!” (P1, female).

Affability of the Diabetes Awareness Event

Many Public Event Attendees appreciated the laid back style of delivery by the Diabetes Champions at the event. Humour and the presence of a two-way dialogue between “health advisor” (a Public Event Attendees term for the Diabetes Champion) and those attending the event was also appreciated by all participants. Events are delivered by peers, and this tended to remove the barrier that can exist when patients have a consultation with a healthcare professional, such as a doctor:

“Sometimes I don’t want to go to the doctor and be a burden to them” (P1, female).

“I really enjoyed the fun way the guy presented the event and it made me comfortable and I could ask questions without thinking I would look stupid in front of others” (P7, female).

Dissemination of information

All of the Public Event Attendees within the focus group gave poignant examples of situations in which information gained from the Diabetes Awareness Event had been shared with others.

“In general conversations, I must have told tons of people, including those closest to me such as my daughter and neighbours, as well as others I chat to randomly, like people in supermarkets and when out and about” (P8, female).

Further, the conservative nature of human beings with regard to disclosing health information was evident:

“Well at first, it is not something I thought people would know much about – it was only after I told my neighbour that I had been diagnosed with diabetes that I knew she had it too!” (P2, female).

Other themes of note

One woman, who was a diabetic patient, asserted the importance and value of others being more aware of the side-effects and symptoms of diabetes:

“To the outside world, I appear happy and fine when people make jokes about my tiredness and diabetes. However, I feel very upset inside and wish people knew more about diabetes so that maybe they would not make such jokes. I hope these events increase awareness so that others do not feel like me” (P4, female).

3.3.0. Social Return on Investment

3.3.1. Establishing scope and identifying key stakeholders

The various stakeholders involved, either directly or indirectly, with the DIMPLE Champions project are highlighted in Table 11, where the context of their involvement and the expected changes are explained. A description of the stakeholders can be found in Appendix V.

Table 11. DIMPLE Champion Project stakeholders and their involvement in the Impact Evaluation

| Stakeholders | Group Size | Involvement | Research Method |
|------------------------------------|---|---|----------------------------------|
| NHS INWL Public Health Team | 1 PCT cluster | Provided impact evaluation oversight and guidance | Discussions, SROI |
| CLAHRC NWL | 1 organization encompassing 20 members of the core team | Provide a strategic role in supporting the impact evaluation – not included in the SROI per se, aside from initial investment | Discussions, SROI |
| Diabetes Champions | 20 | Two focus groups were held, one with experienced Champions and another with newly trained Champions. All active Champions were asked to complete the questionnaire | Focus group, questionnaire, SROI |
| Population engaged | 4139+ | All population members in attendance at Diabetes Awareness Events between 1 st July and 1 st August 2012 were invited to participate in the impact evaluation | Focus group, questionnaire, SROI |
| Referral agencies | 2+ | Not included within impact evaluation | N/A |
| Indirect beneficiaries | 12417+ | Complex and not factored into the SROI | N/A |

3.3.2. Mapping outcomes

Potential outcomes from the DIMPLE Diabetes Champions project were applicable for both the Champions themselves and those members of the public that had been engaged at Diabetes Awareness Events. The Researcher, Senior Public Health Manager, DIMPLE Diabetes Champions Project Co-ordinator and other members of the public health team at NHS INWL collaboratively identified potential impacts from the project (Appendix V).

3.3.3. Evidencing outcomes and giving them a value

The development of outcome indicators and their subsequent collection is described in Section 2.10. It is necessary to estimate how long each outcome would last for the Diabetes Champions and the Public Event Attendees; this can be found in the Appendix VI.

The hourly wage of a health trainer was used to calculate a financial proxy for the working hours that the DIMPLE Champions have invested for the totality of events delivered until July 2012. Health trainers are individuals who engage with people in local communities to achieve behaviour and lifestyle change (NHS Careers, 2012). Health trainers are in Band 3 of the Agenda to Change pay system, ranging from £16,110 to £19,077 per annum. The median value of this pay band was used as an annual health trainer wage. The following calculation was performed to estimate an hourly wage:

$$\text{£17,594 [annual wage]} / 52 [\text{weekly wage}] / 37.5 [\text{hourly wage}] = \text{£9.02}$$

The cost of an Entry Level 3 Certificate in Employability was used as a proxy for the Champions self-reported increases in professional skills and employability. This certificate is currently subsidised by the government for individuals on social benefits; the baseline price of the course is £479 over a 4 week period (Learn Direct, 2012). Thus, £479 is estimated to be saved by the government from Champions who report increases in their employability and professional skillset.

New friendships were a valuable outcome but considered too cumbersome to attach a monetary value to. Some researchers have attempted to assign value to friendships (Powdthavee, 2008); however, the £15,000 value assigned in this study was considered

highly inflated. Consequently, the price of a confidence book and audio CD was used as a financial proxy of an increase in confidence (Waterstones, 2012).

The estimated cost of undiagnosed diabetes per person in the UK was carried out using prevalence data from the Association of Public Health Observatories (YHPHO, 2012) and financial estimates of the burden of undiagnosed diabetes from a study by the York Health Economics Consortium (Hex *et al.*, 2012). The following calculation was used:

$$\textit{Estimated cost of undiagnosed diabetes [£1.5 billion per annum] / estimated number of people with undiagnosed diabetes [850,000] = £1764.71}$$

Consequently, the financial proxy of a person being signposted to services for a diabetes test and subsequently being positive is **£1764.71** per annum of undiagnosed diabetes.

When assessing the totality of the monetary benefits of the Diabetes Champions project, over a 15 month period between April 2011 and July 2012, the percentage of respondents from each of the two surveys were used in combination with the total number of people engaged in all events throughout this period. The calculation spread sheet used to estimate the respective cost of each benefit is available in Appendix VI.

The total value of outputs was estimated to be **£1,524,997.00**.

Table 12. Changes and prevalence experienced by included stakeholders and their respective financial proxies and values

| Stakeholder | Percentage Experiencing Change | Benefit | Financial Proxy | Value |
|------------------------|---|---|--|---------------------|
| Champions | N/A | Savings from Health Trainer wage of health promotion in communities | Hourly wage | £9.02 |
| Champions | 50% | Increased confidence | Instant confidence book + CD (Paul McKenna) | £7.26 one off fee |
| Champions | 100% | Improved social skills | Online dating membership | £119.98 per year |
| Champions | 75% | Increased professional skillset | Entry Level 3 Certificate in Employability | £479 one off fee |
| Champions | N/A | Improved diabetes management | N/A | N/A |
| Public Event Attendees | Not measured quantitatively – estimate at 50% | Increased confidence | Instant confidence book + CD (Paul McKenna) | £7.26 one off fee |
| Public Event Attendees | 74% | Increased knowledge re: foods and change in eating habits | Weight Watchers annual membership | £239.98 per year |
| Public Event Attendees | 82% | Increased exercise | Over 65s swimming membership | £180 per year |
| Public Event Attendees | 2.6% | Earlier diagnosis of diabetes | Peer-reviewed literature, APHO prevalence model data and web reporting tool data | £1764.71 per person |

Financial cost of inputs:

When calculating the cost of the DIMPLE Champions project as a whole, a bottom-up approach was used. All aspects of financial outlay for the project were calculated, with adjustments made for percentage of time spent on Champions project (see Appendix VII). This was in preference to a top down approach of simply dividing the core DIMPLE funding of £100,000, matched by CLAHRC (£200,000 in total), by three. The final estimated of costs of the DIMPLE Diabetes Champions project are:

£134,281.00

3.3.4. Establishing impact

This adjusts for confounding factors that could have impacted upon the outcomes of the DIMPLE Champions project. It comprises four main sub-stages; establishing deadweight and displacement, adjusting for attribution, adjusting for drop-off and calculating the overall impact.

Deadweight refers to the percentage change in outcome variables that would have happened anyway, in the absence of the DIMPLE Diabetes Champions project. This was set at 0% for all outcomes because a Diabetes Champions project has not previously existed in either H&F or Harrow.

Attribution is a valuation of the contributions of other factors in obtaining the given outcomes. In this project, it was prudent to appreciate that other information and events regarding lifestyle advice could have been attended or viewed by the Public Event Attendees. Attribution, deadweight, displacement and drop-off figures can be found in Appendix VII.

A discount rate was not included in this analysis due to the relatively short time-horizon used (6 months for Public Event Attendees and 30 months for Diabetes Champions).

3.3.5. Calculating the SROI

All of the benefits of the project, in monetary terms, were combined together to reach a 'sum of benefits' calculation. This was then divided by the total cost of the project to estimate the SROI figure:

$$\text{Value of Outputs [£1,524,997.00]} / \text{Value of Inputs [£134,281.00]} = \text{SROI} = 11.36$$

For every £1 spent on the DIMPLE Diabetes Champions project, a total of £11.36 is generated in social value.

Sensitivity Analysis

The SROI calculation is only as rigorous as the assumptions that have been made in valuing the inputs and outputs of the DIMPLE Diabetes Champions project. Consequently, a full sensitivity analysis, where values of certain parameters were modified, is recommended in future studies.

3.3.6. Reporting, using and embedding

INWL PCT will use the SROI analyses work, and the impact evaluation as a whole, in order to seek further funding for this initiative by commissioners. Stakeholders will be informed of the results and will have access to the full impact evaluation methodology in the DIMPLE steering committee meeting in September 2012. Further, the concept of SROI will be used in future projects by the INWL PCT.

4.0. Discussion

This study aimed to ascertain the impact that the DIMPLE Diabetes Champions project had on both the Diabetes Champions and the Public Event Attendees of whom they interact with. Namely, changes in a range of outcome variables such as diabetes knowledge, health behaviours and psychological factors were assessed. This section discusses the main findings from the qualitative and SROI work; comparing this with the current evidence base for health promotion initiatives similar in nature to this project. The implications of this study on health policy, particularly in light of alterations to NHS structures, are discussed, future research areas are postulated and recommendations made.

4.1. Summary of main findings

An extremely high percentage of Diabetes Champions reported positive outcome measures since becoming Champions, including the role positively affecting their health (84%), increasing their social skills (100%) and professional skills (75%). The focus groups enabled the researcher to ask 'how' and 'why' questions with regard to these self-reported changes.

Within the focus groups and questionnaires, respondents stated they shared newly acquired knowledge of diabetes and its signs and symptoms to others, including neighbours, friends and family members. This has the potential for knock-on effects, particularly in younger generations, and is important considering the alarming recent rise in T2DM prevalence in children and young adults (Balasanthiran *et al.*, 2012 and Haines *et al.*, 2007).

One respondent was identified as having diabetes after being signposted for testing by a Diabetes Champion; she was undiagnosed and asymptomatic before the event. Although a solitary finding, it does highlight the value of this initiative.

A social return on investment of £11.36 per £1 spent represents a "good investment"; however, there are a number of assumptions in the model, so this figure is indicative and is not considered a definitive sum of return until proxies are justified as final.

This study provides further evidence that health promotion initiatives have positive impacts upon their target populations.

4.2. Comparison to previous research

Coe and Boardman (2008) found lifestyle changes to have occurred at both the individual and household level in the Apnee Sehat initiative; the delivery of culturally sensitive information by peers, to their respective community, boosted engagement attendees. It is important that health promotion initiatives are culturally appropriate (Hawthorne *et al.*, 2008; NICE, 2008 and NICE, 2011).

The Altogether Better study found is a collection of 16 projects, hosted by Yorkshire and Humber Strategic Health Authority. These fall into three broad themes of physical activity, healthy eating and mental health and wellbeing. In an evaluative thematic analysis of the impact on the Community Health Champions and the respective community, the positive findings reported are similar to this study. Namely, increased confidence, self-esteem and wellbeing were reported, along with a spread of health knowledge to individuals throughout a community. The health and social capital of communities targeted were also reported to have benefited from the initiative (Woodall, White and South, 2012). Furthermore, a positive social return on investment of between £0.79 and £112.42 per £1 spent was calculated for each of the 16 projects (Altogether Better, 2012). Segal, Dalton and Richardson (2008) found primary preventive approaches for T2DM to be highly cost effective.

Diabetes UK currently hold a Healthy Lifestyles Roadshow, reaching many parts of the U.K., offering free at point of care risk assessments for T2DM; in 2011, 15,000 people were reached in such a manner (Diabetes UK, 2012).

There are many other locally funded initiatives of primary prevention throughout the UK that have increased detection of diabetes and helped deliver lifestyle advice; including “The Big Bolton Health Check”, where over 73,000 individuals were engaged and over 900 cases of diabetes were detected (Department of Health, 2012).

Increased risk assessments and earlier identification of diabetes are of continued importance. NHS Health Checks, in which individuals between 40 and 74 years are invited to risk assessment of diabetes, cardiac disease, stroke and kidney disease, offers promise (Department of Health, 2009). However, universal implementation of the NHS Health Check

initiative has yet to occur. Moreover, T2DM is increasingly manifesting at an earlier age, especially in BME community groups (Haines *et al.*, 2007); consequently, a level of unmet need would still exist even if universal implementation of the Health Check programme occurred, highlighting the continual need for initiatives such as that of the DIMPLE Diabetes Champions.

4.3. Strengths of the study

Imkampe and Gulliford (2011) highlight an increase in the socio-economic inequalities for T2DM in the UK. The Diabetes Champions initiative has the benefit of reaching those most likely to be afflicted with diabetes, through its work with BME groups, particularly Black African Caribbean and South Asian individuals.

Interviewer bias was mitigated by ensuring the absence of leading questions, verbal cues and physical cues (*i.e.* head nodding or verbal agreement with comments, within the focus group setting). The perspective was neutral, with no *a priori* assumption towards the Diabetes Champions project being a success or failure. The focus groups followed a uniform structure, with the researcher being aware of the importance of body composition and tone of voice when conducting the sessions to limit interviewer bias.

Problems of internal validity were mitigated by methodological triangulation, achieved by utilising multiple data collection methods: questionnaires for self-completion online, via a telephone conversation, and focus groups. All data yielded from these methods were consistent with one another, with positive knowledge, awareness and behavioural outcomes for both Diabetes Champions and Public Event Attendees.

SROI is a new methodology within health economics and is most similar to a cost-benefit analysis. In recent years, PCTs have used the approach to estimate the added value of a range of primary prevention initiatives (NHS Liverpool PCT, 2010). To the author's best knowledge, the SROI carried out in this study is one of the first of its kind within a QI setting. The SROI analysis can be used by NHS INWL, the local authority, other PCTs and local authorities nationwide to compare the DIMPLE Champions initiative with other health promotion initiatives and interventions and to obtain a sense of value. SROI can be undertaken within a quick time scale, avoiding the use of complex and time consuming

economic modelling, and directly informing commissioning. SROI involves all stakeholders, giving all parties a sense of ownership of the work. Further, the SROI Network (2012) has recently published guidance for commissioners to ensure investment in services that provide optimum value.

It is essential that commissioners 'invest to save' to reduce the long-term burden of diabetes via effective population based primary preventive initiatives (NHS Primary Care Commissioning, 2009). This study (and other aforementioned studies within the literature) shows the potential to influence positively two of the five domains that encompass the NHS Outcome Framework for 2012/2013 (Department of Health, 2012), with a peer-led intervention targeting local populations.

4.4. Limitations of the study

The questionnaires were designed by the researcher and thus were not externally tested for validity and reliability. A range of standardised questionnaires are available that measure health status (*i.e.* EQ-5D: Janssen *et al.*, 2011), diabetes knowledge (*i.e.* 24-DKQ: Garcia *et al.*, 2001) and psychosocial outcomes (*i.e.* The Rosenberg Self-Esteem Scale: Rosenberg, 1965). However, with divergent outcome measures being assessed in this study, using these standardised questionnaires would have made the survey instrument very lengthy. This risks a detrimental effect on the response rate (Sahlqvist *et al.*, 2011), so two shorter, unstandardized questionnaires were developed. To increase validity and reliability, these were proof-read by the public health team at INWL PCT and piloted with Diabetes Champions and Public Event Attendees. A level of English, suitable for lay persons, was used to aid comprehension, reducing measurement error.

The cohort size of Diabetes Champions meant that it was not feasible to conduct more than one focus group. In the thematic analysis of the focus groups, only one researcher was involved with familiarising the data and generating codes and subsequent themes. Some researchers state this as a benefit, due to enrichment of data and familiarisation with the research in its entirety (Bradley, Curry and Devers, 2007), but others maintain the importance and rigour of ensuring multiple coding of data (Barbour, 2001).

Recordings from the telephone interviews were not transcribed due to time limitations; the estimated transcribing time ratio for interviews is 6 hours spent writing a transcript for every 1 hour interview time. Thirty-six telephone interviews were recorded, equating to an approximate 216 hours of transcribing. This was considered unfeasible in this study but could be used as a source of qualitative data in future analyses.

This study utilised self-reported methods to measure impact and assess change. Prince *et al.* (2008) found that self-reported measurements for physical activity have a tendency to be imprecise, and direct measurements are preferred. The findings and subsequent conclusions drawn from this study have relied on the assumption of accuracy of the self-reported changes measured in the questionnaires, but were mitigated by the methodological triangulation.

The issue of “reverse causality” is problematic. The effects (increased physical activity, change in eating habits and higher levels of confidence) could have preceded the diabetes awareness events or be brought about by confounding factors other than the Diabetes Awareness Event. Self-reporting of information in this study could have exacerbated this through social desirability bias, with respondents potentially answering in a manner to “please the researcher” (*i.e.* in a positive way, or over-reporting changes).

Recall bias is unlikely, given that telephoning, e-mail questionnaire invitations and focus groups were conducted within 2-3 weeks of the Diabetes Awareness Event occurring. Similarly, interviewer bias is unlikely; telephone interviews were recorded and reviewed to explore the presence of leading questions, none of which were asked. A possibility exists that systematic differences occur between those who completed the questionnaires and the non-responders. For instance, this study was purely conducted in English, yet some individuals that the Champions target do not speak English well. Additionally, those participating respondents may be more enthusiastic regarding the DIMPLE initiative than those who did not respond.

The SROI ratio calculated is heavily influenced by financial proxies given to outcomes. This has been controlled for by adopting sensible and moderate proxies, with a sensitivity analysis testing the robustness of the ratio. Further, all proxies and assumptions are transparent, with others able to scrutinize and modify the ratio, if desired.

4.5.0. Implications

4.5.1. Combatting an 'Inverse Prevention' Law

Hart (1971) coined the term 'inverse care law' to refer to the phenomenon of good medical care varying inversely with a population's need for it. A cross sectional analysis of Health Survey for England data report a decline in the percentage of the population who engage in three or more unhealthy behaviours (King's Fund, 2012). However, this masks an overall increase in three or more unhealthy behaviours in sub-sections of the population whom are least educated and the most deprived.

Sir Michael Marmot's idea of 'proportionate universalism' is particularly pertinent for tackling health inequalities; the intensity and scale of public health interventions should be proportionate to the relative degree of disadvantage within a given community (Marmot *et al.*, 2010). It is vital that the coalition government stick with its principle of 'improving the health of the poorest, fastest' (H.M. Government, 2010). In Hammersmith and Fulham, deprivation associated inequalities exist within the borough (Association of Public Health Observatories, 2008). Using the Index of Multiple Deprivation to map the areas where Diabetes Champions could have the maximum potential impact could be advantageous (Noble *et al.*, 2012). The future recruitment of Champions from such deprived areas could also have the potential to create social capital, whilst engaging and educating members of the community about diabetes.

4.5.2. Developing partnership working and integrated levels of care

Harris and Haines (2012) contemplate the idea of a universal workforce of community health workers to collaborate with and be part of the primary care system within the UK. The underpinnings of such a recommendation stem from a successful initiative of integrated community health workers within the primary care system in Brazil.

A collaborative network of Diabetes Champions, Health Trainers and Community Health Workers working alongside GPs would be an interesting initiative within the UK setting. Ideally, this would initially be piloted in an area of high estimated diabetes prevalence and deprivation.

The Health and Social Care Act 2012 will be implemented in April 2013, abolishing the 152 primary care trusts throughout England and the 10 strategic health authorities (H.M. Government, 2012). In their place, more than 300 Clinical Commissioning Groups (CCGs) will have the responsibility of ensuring effective purchasing, integration and delivery of diabetes services in local communities, supported by and accountable to the NHS Commissioning Board, an overarching independent organisation (O'Flynn and Potter, 2011). The Health and Wellbeing boards have an important task of ensuring that CCGs work with local authorities so that commissioning accurately reflects the local public health priorities (Department of Health, 2012).

A reduction in premature mortality in diabetics can be achieved via more integrated levels of care, as highlighted in the North West London Integrated Care Pilot, which shares both patient records and clinical care pathways between multi-disciplinary teams (Majeed *et al.*, 2012).

In the 'Health Improvement' domain of the recently published Public Health Outcomes Framework for 2013-2016 (Department of Health, 2012), indicators such as diet, excess weight in adults, self-reported wellbeing, proportion of physically active adults and recorded diabetes prevalence can all be positively affected by local initiatives. Evidence that the DIMPLE Diabetes Champions initiative has affected these outcomes is provided in this study.

4.6. Future research

Although RCTs are no panacea, and problems exist in the real world setting due to inherent variation and confounding, guidelines exist for such work (Medical Research Council, 2008) and it would be advantageous to see if a statistically significant difference in outcome measures occurs, before and after a Diabetes Champions intervention. Further, the promising role of SROI in future commissioning of health services by local authorities needs to be further elucidated.

4.7. Conclusions

The DIMPLE Diabetes Champions initiative had demonstrable impacts upon all of those involved. Self-reported increases in knowledge of diabetes, positive psychosocial outcomes, an increase in exercise frequency and change of diet were evident. Further, the wider social impact was evident. The use of SROI has manifold benefits, including the rapidity of analyses and the accessibility of the method. Health promotion and primary preventive initiatives such as the DIMPLE Diabetes Champions initiative have important roles to play in empowering communities to be more aware of diabetes, its risk factors, signs and symptoms in order to halt the alarming rise in prevalence and to increase the number of individuals identified with diabetes.

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