South Gloucestershire Diabetes Prevention Pilot Project

Full Evaluation Report

November 2016

South Gloucestershire Diabetes Prevention Pilot Project: Full Evaluation Report

Report authors

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We would like to thank all participants for their time and commitment in completing the questionnaires and physical measurements. We hope that the learning from this work will help direct better action on the prevention of type 2 diabetes and other long-term conditions.

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Diabetes Prevention

Type 2 diabetes is a serious, expensive and growing public health challenge. In England, national guidance recommends intensive lifestyle interventions promoting weight loss for people at risk of diabetes, and programmes of individualised care, information and advice for those recently diagnosed with type 2 diabetes (NICE, 2012; NICE, 2015). As NHS England rolls out an ambitious National Diabetes Prevention Programme (NDPP), it is essential that areas develop the staff skills, organisational capacity and local insight to make the most of this initiative. The South Gloucestershire Diabetes Prevention (pilot) Project (SGDPP) reflects priorities identified in Bristol North Somerset and South Gloucestershire (BNSSG)'s Sustainability and Transformation Plan (STP) on the urgent need for evidence on the implementation, effectiveness and cost-effectiveness of innovative service models for the prevention of diabetes.

South Gloucestershire Diabetes Prevention Pilot Project

The SGDPP developed from a successful bid to Health Education South West in 2015. It was led by South Gloucestershire Council's Public Health & Wellbeing Division, in collaboration with NHS South Gloucestershire CCG, Sirona Health, and Leap Valley Surgery. The pilot built upon the X-PERT Prevention of Diabetes (X-POD) programme (http://www.xperthealth.org.uk/), which consists of a six-week group education course followed by telephone and email support, with meetings scheduled at three months post-course, and again at six months post-enrolment. The design of the programme is compliant with NICE (2012) guidelines on the prevention of diabetes. The pilot was delivered between January and November 2016 through Leap Valley Surgery, offered to patients aged 35-75 years-old and at risk of diabetes – defined by body mass index (BMI) >30kgm^2 recorded in the last five years, plus a key diabetes risk factor such as raised blood glucose (HbA1c; 42-47mmol/mol).

Evaluation research questions and methods

The evaluation examined the impact, implementation, and delivery costs of a diabetes prevention pilot project based on group education, for participants at risk of developing type 2 diabetes. The main evaluation questions were:

1. What were the impacts of the SGDPP on the health and wellbeing of participants at six months post-enrolment?

2. How was the SGDPP implemented, with specific reference to the development of referral pathways, training for delivery staff, and stakeholder perceptions?

3. What were the costs per person associated with the delivery of the pilot?

The evaluation of the SGDPP pilot consisted of a before and after assessment of the biometric (weight, BMI, HbA1c level) and self-reported psychosocial outcomes of participants enrolled on the pilot. This was accompanied by a process evaluation of perceptions of the programme by participants, project staff and wider stakeholders, and a unit cost economic evaluation.

SGDPP staff collected biometric and psychosocial questionnaire measures, inputted this data, and collected the financial data. UWE researchers developed the evaluation plan, conducted qualitative data collection, and undertook most aspects of data analysis.

Participation in the project and evaluation

Out of 300 patients invited by letter, 95 (32%) enrolled, and 87 (29%) completed the course to the six-month stage. An additional four partners, who found they also met the inclusion criteria, enrolled and completed the programme to the six-month stage.

Drop out from the project and evaluation was very low – of the 99 individuals who started, only eight (8%) were unable to attend the six-month meeting and provide evaluation data at this point.

Attendance at each group education session and the six-month follow-up meeting did not fall below 84% capacity, with mean attendance for sessions at 90% capacity. Sixty-three (63.6%) participants attended all six group sessions. The mean contact time at group sessions was 10.7 ± 2.4 hours.

Participants provided very positive feedback on the group education sessions – 96% (90) gave a score of 9 or 10 when asked how much they would recommend the course to friends or family (where '0' is extremely unlikely and '10' is extremely likely).

Characteristics of participants at enrolment

Key characteristics of the 99 participants at enrolment were:

- 61.6% (61) female and 99% (98) White British
- 64.6% (64) aged 65 years and above. Mean 64.5 ± 8.2 years. Range 37 to 76 years of age
- 69.7% (68) retired
- 34.4% (34) highest educational attainment was up to 16 years at secondary school
- No participants were resident in an area in the top two national deciles for multiple deprivation; this reflects the demographic characteristics of the GP surgery's catchment. Nearly half (48.5%, n=48) were resident in an area of lowest deprivation (decile 10 in the Index of Multiple Deprivation, IMD).
- 69.7% (69) were obese, and 22.2% (22) overweight
- 52.5% (52) had a family history of diabetes
- 6.6% (4) of female participants had a history of gestational diabetes
- 70.7% (70) had a comorbidity; 34.3% had high blood pressure and 30.3% had arthritis
- 17.2% (17) reported a disability
- 24.2% (24) were taking part/or recently took part in another healthy lifestyle activity, such as a walking group, sport group or weight management group

Outcomes at six months

The table below shows that there were significant improvements for all measures, apart from those relating to mental wellbeing and mental ill health.

	No. of participants (n)	Baseline mean (SD)	6-month mean (SD)	Mean difference	Std. deviation difference	95% CI of difference
Weight (kg)	91	93.50 (16.38)	89.45 (16.28)	-4.04***	4.62	-5.01, -3.08
BMI (kg/m^2)	91	33.81 (5.95)	32.38 (6.10)	-1.43***	1.62	-1.77, -1.09
Waist circumference (cm)	91	107.37 (12.22)	102.05 (12.50)	-5.32***	5.03	-6.37, -4.27
HbA1c (mmol/mol)	91	42.24 (5.26)	38.79 (3.46)	-3.45***	4.07	-4.30, -2.60
Proportion meeting recommended physical activity guidelines	91	0.16 (0.37)	0.30 (0.46)	0.13**	0.48	0.03, 0.23
Mean no. of minutes/week of MVPA[§]	91	189.43 (275.26)	421.66 (498.15)	232.23***	488.15	130.57, 333.89
Overall self-reported dietary behaviour	91	49.68 (7.38)	47.24 (7.46)	-2.45***	5.93	-3.68, -1.21
Mental wellbeing (maximum score = 35)	91	27.59 (5.04)	27.64 (5.02)	0.04	3.61	-0.71, 0.80
Anxiety (maximum score = 28)	91	10.00 (3.91)	9.74 (3.41)	-0.26	2.89	-0.86, 0.34
Depression (maximum score = 36)	91	12.87 (4.93)	12.49 (4.42)	-0.37	3.19	-1.04, 0.29

Note: *p<0.05; **p<0.01; ***p≤0.001

[§] MVPA: Moderate-to-vigorous physical activity

The main outcomes relating to weight change for 91 participants at six months can be expressed as follows:

- **The mean weight loss was 4.04kg (SD 4.62)**
- **52.3% (45) achieved ≥3% weight loss**
- **40.7% (35) achieved ≥5% weight loss**
- **12.8% (11) achieved ≥10% weight loss**
- **Excluding participants with normal weight, i.e. BMI<25kg/m^2, 60.5% (52) achieved 2kg weight loss.** At the outset of the evaluation, we set 2kg weight loss as our minimum clinically important difference (MCID).

Further analysis found that:

- **Males lost more weight than females** (Males: M = -5.85kg ± 4.79; females: M = -2.97kg ± 4.19; t (89) = -3.00, p=0.003)
- **Participants living in areas of higher deprivation lost more weight than those resident in less deprived areas** (Higher IMD decile: M = -5.58kg ± 5.45; lower IMD decile: M = -2.95 ± 3.58; t (59.3) = -2.60, p=0.012)

There were no associations, or associations could not be determined due to small sample sizes, between weight loss and age category, employment status or educational level.

Stepwise multiple regression results found that gender, followed by area deprivation, were predictors of weight change at six months post-enrolment ($p<0.01$). Three other factors – contact time at group sessions, co-morbidities, and prior and/or concurrent engagement with other healthy lifestyle activities – were not predictors of weight change.

Process evaluation findings: Participants

Data were collected from fourteen focus groups (total of 62 participants), five one-to-one and telephone interviews, and written feedback from one participant.

The qualitative data suggest that the organisation, clarity of goals, and personal qualities of the delivery team were essential aspects of the success of the programme. These features appear to have supported the strong uptake and retention to the programme, satisfaction with the group-based format, and commitment of participants to achieve goals that directly reduce their risk of diabetes. The programme content was broadly well received and has underpinned what was perceived to be valuable new knowledge for participants. Positive elements of participant feedback can be summarised as follows:

- personal relevance and importance of the programme;
- overall clarity of the key messages;
- perceived influence of the programme on knowledge, skills, attitudes, motivations to change, and confidence to manage risk;
- personalised support on specific matters;
- 'professional' handling of sensitive issues;
- skills ('soft' and 'hard') of group educators;
- clarity of format and organisation of the programme;
- peer support and opportunities for participation;
- shared learning beyond the group: family, friends and acquaintances;
- diabetes prevention is a very important issue to put out in South Gloucestershire, not just with at-risk groups, but with the wider public (including children) and professionals; and
- some participants felt motivated to help professionals in this work.

Participants had a range of suggestions about the development and rollout of the programme. Staff need to be fully prepared to respond to queries following mail-outs of the initial GP surgery letter of invitation. This was felt to be an especially important moment for engagement given that individuals may be surprised or shocked, and will want further information. The programme itself would benefit from further revisions to make some aspects of the course less complicated, particularly the aspects covering biological/medical education on diabetes and the dietary advice. However, participants recognised that this was challenging given the nature of the subject matter. Some participants also felt that there could be more emphasis on physical activity goals and tips on changing levels of physical activity. Opportunities for networking between groups and for keeping up contacts after the programme could help people maintain changes and share their learning as part of wider community initiatives.

Process evaluation findings: Staff and wider stakeholders

Interview and written feedback was provided by three staff members directly involved in delivery, two expert patients and two GP surgery staff. As part of an expert panel, ten practitioners (external to the programme) from the local authority, GP practices, local CCGs, and community and voluntary sector agencies provided feedback on early stage results of the pilot evaluation in September 2016.

The pilot project was perceived by staff and stakeholders to have performed very strongly. Take-up (at 29%) and retention (at 92%) were considerably higher than the Project Steering Group anticipated. Based upon work in other areas, the group anticipated recruiting no more than 20% of invitees and retaining under 80% of those originally enrolled at six months. The outcome results also compared very favourably to similar programmes. Staff and stakeholders felt that a number of reasons could account for the project's performance.

Prior to the pilot, the delivery team had not run a diabetes prevention project. However, staff drew upon their extensive track record in running similar lifestyle education initiatives and combined this with specialist input from partners, for example, from the Diabetic Specialist Nursing Service. The pilot benefited from a well briefed, engaged and supportive GP practice team. The GP practice had an essential role in case finding and management of the initial mail-out to patients. Otherwise, the pilot was not perceived by practice staff to place any undue burdens on work of the practice.

X-PERT's Educator Training course was intensive and provided a thorough grounding for course delivery. However, at the end of the training, only trainees with a clinical background felt confident enough to lead the group sessions. This was felt to be an important consideration for scaling up a pool of educators. X-PERT were felt to be a very supportive organisation over the course of the pilot.

The delivery team invested considerable effort in building personal relationships with participants both during and after the group stage of the project. Staff emphasised the trailblazing nature of the pilot for the local area and the contribution that participants could make through their involvement. In comparison to many GP practices in BNSSG, the Leap Valley catchment does not include areas of high relative deprivation. Staff and stakeholders felt the pilot may have had more challenges with recruitment and retention had it been delivered in areas of higher deprivation.

Unit cost analysis

The cost per person was estimated to be £167 per person for the six months set-up, delivery, administration and management of SGDPP. Sensitivity analysis found the cost per person to range from £107 to £495, with higher costs including X-PERT training, equipment and evaluation.

For context, Public Health England (PHE) states that the NDPP intervention cost is assumed to be £270 per person over an 18-month period. These costs are weighted in the first six months and exclude expenditure on case finding and referring individuals to the programme (PHE, 2016).

Strengths and limitations of the study

The before and after study design does not allow us to compare participants' outcomes with normal care. However, it does allow for tests of association between baseline and follow-up characteristics, and to assess the role of demographic and programme-linked variables in predicting outcomes. The

process evaluation component has had an important role in helping to develop an account of how and why the project may be contributing towards its stated goals and the context within which the programme was implemented. It is important to be aware of the specific characteristics of the context of this pilot for the scaling-up and replication of the programme in other settings. The setting for the pilot was not an area of high social deprivation or high racial/ethnic diversity, which means that the project may need further adaptation or revision if delivered in areas with a different demographic profile.

Conclusions and recommendations

The success of the pilot project and the evaluation depended on close partnerships with all stakeholders, including LA Public Health, NHS South Gloucestershire CCG, Sirona, LTC Clinical Group, Primary Care, the Voluntary Sector and UWE researchers. The project provides evidence of high acceptability, reduced risk of diabetes, wider dietary and physical activity impacts, and potential cost-effectiveness of a group-based diabetes prevention education programme. Recruitment, retention and six-month outcomes exceeded initial expectations. Feedback from participants, staff and stakeholders has provided critical intelligence on how to successfully plan and scale-up the delivery of diabetes prevention work. This information enables best practice to be embedded locally, forming a robust foundation to support development and rollout of the NDPP.

There are a number of recommendations arising from this evaluation:

1. South Gloucestershire Public Health & Wellbeing Division and NHS South Gloucestershire CCG should consider the value of maintaining contacts with participants and collecting 12 months post-enrolment data. Apart from providing evidence of longer-term outcomes, this work will help provide local insight into patterns of retention and the resources involved in maintaining longer-term contacts with participants.
2. The SGDPP delivery team should be supported to consolidate and package their learning to relay on to other parties. Apart from helping to embed best practice locally, this work can be used to support and advise the service provider commissioned to deliver the BNSSG rollout of the NDPP.
3. Where possible, intensive lifestyle programmes such as the SGDPP should have continuity of support from designated educators, and there should be a clear focus on building friendly and supportive group dynamics.
4. In order to add local value and develop sustainable community services, intensive lifestyle programmes such as the SGDPP need to be delivered in parallel with other community-based lifestyle initiatives and self-care programmes.
5. Intensive lifestyle programmes such as the SGDPP should be coordinated with wider population health and related communication campaigns, such as those delivered through local food strategies and annual public health events.
6. A minority of participants in projects such as the SGDPP are likely to be willing to act as local champions, representatives, activists and expert patients. Local and national diabetes prevention initiatives can benefit through working in partnership with such volunteers.

1. Introduction

The prevention of type 2 diabetes has become a public health priority. Five million people in England are at high risk of developing type 2 diabetes. If current trends persist, one in three people will be obese by 2034 and one in ten will develop type 2 diabetes. Recent data show that 2.8 million people have been diagnosed – 2,550,000 (91%) with type 2 diabetes and 250,000 (9%) with type 1 diabetes. It is estimated that a further 500,000 people are living with undiagnosed type 2 diabetes. This carries a considerable societal cost, as well as an annual cost of approximately £10 billion to the NHS, or 10% of the NHS budget, with 80% of this spent on treating complications (Diabetes UK, 2015).

NICE guidance advises that the early detection and treatment of type 2 diabetes is beneficial and that intensive lifestyle programmes have an important role as one form of action (NICE, 2012). Type 2 diabetes is strongly preventable through moderate changes in weight and physical activity (Lindstrom *et al*., 2006), with one kilogram of weight loss being associated with a reduction in diabetes incidence of 16% (Knowler *et al*., 2002). Lifestyle factors targeted by diabetes prevention programmes are also common risk factors for other long-term conditions. For example, a wealth of evidence from randomised controlled trials shows that relatively modest changes in weight (2-3kg) or physical activity (30-60 mins/week of moderate intensity) modify key cardiovascular risk factors to a clinically meaningful extent (Aucott *et al*., 2004; Avenell *et al*., 2004; Bo *et al*., 2007; Esposito *et al*., 2004; Laaksonen *et al*., 2005).

There is a clear need to evaluate such real-world programmes for diabetes prevention and management in UK communities. Indeed, the NICE guidance on diabetes prevention (NICE, 2012) identified a need for "evidence on both the short- and long-term effectiveness and cost-effectiveness of translating prevention trials into UK practice" as well as "a lack of evidence on the barriers to, and facilitators for, implementing intensive lifestyle-change programmes". There is also a need to conduct pragmatic evaluations comparing the outcomes of real-world diabetes prevention interventions with the benchmarks provided by large scale clinical effectiveness studies (Dunkley *et al*., 2014).

The NHS's 2014 publication, "5 Year Forward View - getting serious about prevention", states that the sustainability of the NHS, and the economic prosperity of Britain depend on a radical upgrade in prevention and public health. Launched in 2016, A Healthier You: The NHS Diabetes Prevention Programme (NHS DPP) is a leading example of this shift in direction. With a first wave of 27 areas covering 26 million people and making up to 20,000 places available, the NHS DPP will rollout to the whole country by 2020 with an expected 100,000 referrals available each year after. Those referred will get tailored, personalised help to reduce their risk of type 2 diabetes, including education on healthy eating and lifestyle, help to lose weight, and bespoke physical exercise programmes, which collectively have an evidence-base in reducing the risk of developing the disease.

In advance of this programme, it is essential that areas develop the staff skills, organisational capacity and local insight to make the most of this initiative. The SGDPP pilot evolved in response to

local needs and a clear awareness that the authority had little local experience in delivering intensive diabetes prevention lifestyle interventions. This document reports the evaluation outcomes of the pilot and examines the implications for service development in this field. It starts with an overview of the SGDPP pilot and the evaluation methods, then presents the findings over four sections: participant outcomes, participant feedback, project staff and wider stakeholder feedback, and the economic assessment. The report then reviews the main themes, study limitations, and recommendations for future action.

2. South Gloucestershire Diabetes Prevention Pilot Project

2.1 Origins of the project in South Gloucestershire

The SGDPP pilot project aimed to develop and implement a co-ordinated, tailored and effective programme for patients with non-diabetic hyperglycaemia (NDH), identified via primary and community care. The programme would offer non-pharmacological input such as self-management education (including generic self-management education sessions co-led by peers, telephone support, self-monitoring), client-centred physical activity and healthy eating advice to a defined set of patients.

Both the South Gloucestershire Joint Strategic Needs Assessment (2013) and the South Gloucestershire Health and Wellbeing Strategy (2013) stress the need for diabetes patients to have a universal standard of good care. The Joint Prevention Strategy and The Long-Term Conditions Strategy highlight obesity, pre-diabetes and type 2 diabetes as priority areas within the CCG's plans. The BNSSG Spotlight Diabetes project identified rising prevalence in BNSSG in line with national trends, poor patient/clinical outcomes in some parts of BNSSG, and variation in care across the health and care system.

South Gloucestershire CCG has a population of 260,000 with 25 GP Practices. This represents a significant challenge in terms of numbers of patients at risk of developing type 2 diabetes. Quality and Outcomes Framework (QOF) diabetes data from GP practices across the area highlighted a rise in diabetes prevalence in South Gloucestershire between 2014/15 and 2015/16 of **6.29%** (from 10,954 to 11,690 patients). In 2015/16, **511 patients** in South Gloucestershire had a raised HbA1c identified during a routine health check (511/6043 = 8.5%).

South Gloucestershire Public Health and Wellbeing Division were successful in a bid application from the Health Education South West Membership Council (HESW) to allocate £51,650 of the 2015/16 innovation fund budget to support this proposal. The HESW came into being on 01 April 2013 with a responsibility for driving up the quality of education and training outcomes locally to improve patient care and experiences. The X-PERT Prevention of Diabetes (X-POD) course was chosen after consultation with Professor Colin Greaves, Exeter University, who advises on the NDPP.

2.2 Programme design

The X-POD programme is offered by X-PERT Health (http://www.xperthealth.org.uk/), an award-winning registered charity that provides education to prevent and manage diabetes. This programme, along with the X-PERT Diabetes and X-PERT Insulin programmes, were developed because it was recognised that traditional clinical care was not equipping people with the knowledge, skills and confidence to self-manage their conditions. The mission is: *All people at risk of, or with, diabetes feeling empowered by having the knowledge, understanding and confidence to better manage their health*. The route to practice is by training healthcare professionals and peer educators to deliver the structured education to people at risk of, or with, diabetes.

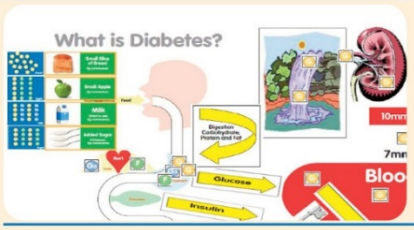
The X-PERT Programmes are structured self-management education that meets the key criteria to implement NICE Guidance. The philosophy supports participant empowerment and evidence-based practice, it has a written structured curriculum, trained educators who are quality assured, and process, satisfaction and health outcomes are audited. It has been shown to be effective in improving health and quality of life outcomes in a randomised controlled trial (RCT) and in routine national implementation (Deakin *et al.,* 2006 & 2011). The cost-effectiveness of self-management programmes has been investigated and X-PERT was shown to be the most cost-effective programme with one quality-adjusted life-year (QALY) gained costing less than €20,000 (Jacobs-Van Der Bruggen *et al*., 2009). The 2011 X-PERT Audit of 16,031 participants demonstrated that national implementation of the X-PERT Diabetes Programme could result in a cost saving to the NHS of £367 million per annum (Deakin *et al.,* 2011) and the 2016 audit report replicates the outcomes (https://goo.gl/qv3mqI).

The X-POD programme is a six-week group education programme that does not focus on prescription, dictation and reprimand. Instead, it aims to be an enjoyable way of learning about pre-diabetes, using visual aids and discovery learning, and it enables individuals to make their own informed decisions and set goals to improve their health. Participants also receive a comprehensive handbook that they can refer to during and in between sessions, and there is also the opportunity to attend a follow-up refresher session within 18 months post-completion of the programme.

Chart 1 (below) summarises the content of the six-week programme. Diabetes UK 2011 dietary guidelines acknowledge that nutrition management has shifted from a prescriptive 'one-size fits all' approach to a person-centred approach. They also recognise that the ideal proportion of macronutrients for weight loss and optimal blood glucose control is unknown and that it is the degree of adherence that will predict outcomes, so it is intuitive that a diet an individual enjoys and finds acceptable is more likely to succeed. During the X-POD programme, participants are therefore encouraged to adopt their diet of choice. The dietary approaches discussed are low fat, low carb, Mediterranean, and intermittent fasting, along with carbohydrate and fat awareness education. Participants also receive their health results with explanations delivered using easy to understand terminology and obtain an understanding with confidence on how to prevent long-term conditions such as type 2 diabetes, cardiovascular disease and fatty liver.

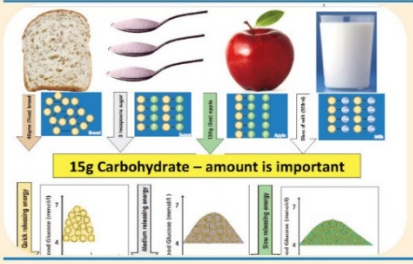
Chart 1: Main content of the X-POD six-week programme [Source: X-PERT Health]

X-PERT Prevention & Management Summary



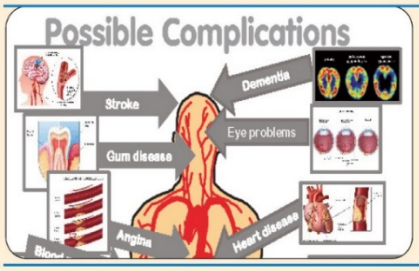
Section 1: What is pre-diabetes and diabetes?
Digestion, carbs and blood glucose control
The 7 lifestyle factors for optimal health
Health results - what do they mean?
Medications for diabetes
Setting goals: my health results

Section 2: Nutrition for health
Energy balance - what is it?
Nutrition for health - food groups/portions
Addressing the myths and misconceptions
Dietary approaches - low fat, Mediterranean, low carb, intermittent fasting, 500kcal deficient
Fat awareness
Setting goals: my dietary approach

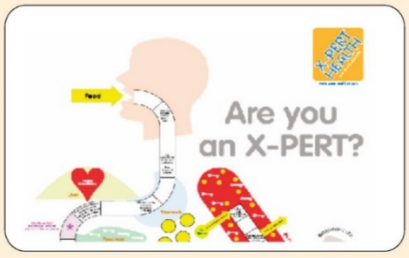


Section 3: Carbohydrate awareness
Carbohydrate and blood glucose levels
Assessing the *amount* of carbohydrate
Considering the *type* of carbohydrate
How good am I at estimating carbs?
What is my daily intake of carbs?
Setting goals: my carb intake

Section 4: Food labels and physical activity
Nutritional information on food packaging
The traffic light system & reference Intakes (RIs)
Nutritional claims - what do they mean?
Labelling for different dietary approaches
Physical activity - what, when and how?
Setting goals: my foods and activity



Section 5: Health check and reducing risk
Low and high blood glucose levels
How could diabetes affect my long-term health?
Prevention of complications
Importance of regular check ups
Work, driving, insurance, travel and sick days
Setting goals: reducing my risk



Section 6: Re-capping and the way forward
Recapping with the X-PERT Game
What resources are available to help me?
Revisiting my health profile
Have my needs been addressed?
More confidence to self-manage my health?
Setting goals: my diabetes goals for the future...

2.3 Programme implementation

The programme started in August 2015 with the establishment of a steering group with representation from SGC Public Health, the CCG, UWE and local health providers. A team leader was appointed in early autumn 2015. As part of the overall plan, the intention of the pilot was to train educators and run a small number of group based programmes in association with a GP surgery. Leap Valley surgery (along with its sister surgery, Abbotswood), was selected on the basis that it had shown an active interest in supporting the initiative.

Table 1: Timeline summarising the programme delivery and associated evaluation

June 2015	Funding for pilot programme secured from HESW
Aug 2015	Appointment of UWE evaluation team
Sept 2015	Establishment of DPP Steering Group
Sept-Oct 2015	Research Governance Approval General Service Contract established
Oct 2015	Recruitment of Diabetes Prevention Officer
Nov 2015	X-PERT Health as chosen provider Data collection framework for outcome evaluation
Dec 2015	Eligibility criteria / 500 Patients identified
Jan 2016	300 patients invited to sessions 8 Educators trained to deliver **Phase 1. Start of group courses (Groups A-D)**
March 2016	**Phase 1. Completion of six week courses (Groups A-D)**
April 2016	**Phase 2. Start of group courses (Groups E-G)**
June 2016	**Phase 2. Completion of six week courses (Groups E-G)**
July 2016	**Phase 1. Six month data collection (Groups A-D)**
Sept 2016	Preliminary evaluation findings reported to Expert Panel Preliminary findings for SGDPP in BNSSG STP bid for NHS DPP rollout
Oct 2016	**Phase 2. Six month data collection (Groups E-G)** BNSSG STP bid for NHS DPP successful
Nov 2016	Final SGDPP evaluation report

Figure 1: Taking part in the SGDPP group sessions

NB: Participants provided permission for the use of these photos in the evaluation

Following an initial search of the Leap Valley patient records (Table 2), the Steering Group decided to use the inclusion criteria for sending out patient invitation letters set out in Box 1 below. Details of the invitation letter are provided in Appendix 1.

Table 2: Results based on search of patient records at the pilot GP Surgery (Patient roll: 10,434)

Search terms/criteria	Number
Raised HbA1c: 42 – 47mmol/mol (not diagnosed diabetic)	273
BMI >30kg/m^2	1587
Raised HbA1c + BMI >30kg/m^2	115
Family history of diabetes	872
Cardiovascular disease (CVD, any)	639
CVD + over 40 years-old	604
Hypertension	1254
Hypertension + [40 years-old < Age < 75 years-old]	1240
Hypertension + [40 years-old < Age < 75 years-old] + [BMI >30kg/m^2]	727
Hypertension + [40 years-old < Age < 75 years-old] + [BMI >30kg/m^2] + raised HbA1c	339

Gestational diabetes or polycystic ovary syndrome (PCOS)	109
BMI >30kg/m^2 (in last two years), [40 years-old < Age < 75 years-old] + one other risk factor	135
BMI >30kg/m^2 (in last five years), [40 years-old < Age < 75 years-old] + one other risk factor	360
BMI >30kg/m^2 (ever had), [40 years-old < Age < 75 years-old] + one other risk factor	536

Box 1: Inclusion criteria used for patient letter invitations

- Aged 35 – 75yrs AND
- Raised BMI (>30kg/m^2) (recorded at some point within last five years)

PLUS one of following criteria:

- Previous raised HbA1c
- Cardiovascular disease (CVD)
- Hypertension
- Polycystic Ovary Syndrome (PCOS)
- Family history of diabetes
- History of gestational diabetes
- Black or minority ethnic (BME) group

At the point of sending out the letters of invitation, it was assumed that the take up rate would be under 20%. Respondents were provided with an introduction to the programme by phone and invited to enrol on scheduled group-based courses. These were delivered over two phases starting in January and April 2016. After completion of the six-week course, the programme lead sent out motivational emails to each group before holding a 'reunion' for each group at three and six months post-enrolment to share their experiences and complete follow-up measures.

3. Evaluation research questions

The aim of the evaluation was to present a robust and transparent account of the impacts of the SGDPP for participants, to examine the implementation of the project, and to assess delivery costs. The evaluation was designed to complement and build upon the project's performance monitoring plan. The overall evaluation questions were:

1. What are the impacts of the project on the health and wellbeing of participants at six months post-enrolment?
2. How was the project implemented, with specific reference to the development of referral pathways, training of delivery staff, and stakeholder perceptions?
3. What were the costs per person associated with the delivery of the project?

4. Methods

4.1 Overview

Building upon the research questions, the evaluation was organised around three areas concerned with (1) a baseline follow-up study of the outcomes for a sample of participants, (2) a process evaluation of perceptions of the implementation of the project by participants, project staff and wider stakeholders, and (3) an economic evaluation.

There was a division of roles between the South Gloucestershire Council Public Health (SGCPH) team and the UWE Bristol team. The SGCPH delivery team were largely responsible for the collection and inputting of questionnaire, biometric and financial data. The UWE team focused on the development of the evaluation framework, data collection tools and data analysis. UWE led the interview-based elements of the process evaluation. SGCPH and UWE collaborated in the production of the report and the interpretation of findings.

4.2 Outcome evaluation

This component of the evaluation focused on changes that reflect anticipated outcomes for participants. These were concerned with assessing changes in weight loss, waist circumference, HbA1c, general health, physical activity, dietary behaviour, mental wellbeing, mental ill health and social wellbeing.

Sampling and recruitment

Study participants were individuals who met the eligibility criteria for the diabetes prevention project. We agreed to a target of at least 30 completed matched pairs of before and after data by month 7 after programme commencement. At 56, the actual number of matched pairs from Phase 1 of the programme was substantially higher than the original target, and was further supplemented by 35 matched pairs from Phase 2 (Total = 91).

Tools and measures

Participants completed a baseline questionnaire at enrolment and a follow-up questionnaire at six months. Within the timescale of the pilot and its evaluation, follow-up at 12 months was not feasible. However, the evaluation framework was to be 'future-proofed' to enable such data collection should resources become available to do so, and 12-month data collection has been organised for December 2016 and March 2017.

The questionnaire built upon tools developed for evaluations of other diabetes prevention programmes, including the Living Well, Taking Control programme (Kok *et al.,* 2016) and associated Community-based Prevention of Diabetes (ComPoD) trial. Participants completed a questionnaire prior to participation in the core six-week group sessions, either in an individual session in the week prior to the six-week programme, or on arrival at the first group session. All participants were asked to provide demographic information (date of birth, gender, 'race'/ethnicity (here on: ethnicity), employment, education, disability), co-morbidities, and prior and/or concurrent participation in other healthy lifestyle activities.

The questionnaire also covered the following areas:

- Overall life satisfaction (Life Satisfaction Scale, Abdallah *et al.,* 2008)
- Mental wellbeing (SWEMBS – Short Warwick Edinburgh Mental Wellbeing Scale, Tennant *et al.,* 2007)
- Mental ill health (Generalised Anxiety Disorder 7-item scale (GAD-7) and Patient Health Questionnaire (PHQ-9) for depression
- Physical activity (NZPAQ, McLean & Tobias, 2004)
- Dietary behaviour (Fat and Fibre Questionnaire, adapted from Shannon *et al.,* 1997)
- Motivation to change diet and physical activity behaviour (adapted from Miller & Johnson, 2008)

Biometric measures of height and weight (and thus BMI), waist circumference, and blood pressure were assessed by programme educators at baseline, on arrival at the first group session. At the point of enrolment and after six months, participants were asked to provide a blood sample for an HbA1c test, administered through the GP surgery.

During the follow-up sessions at 6 months, participants were asked to complete the same questionnaire as used at baseline, and HbA1c, weight, height, waist circumference, and blood pressure were assessed by the programme educator. They were also asked to provide feedback on programme satisfaction and the family/friends recommendation test (NHS England, 2013).

Data entry and analysis

Data was entered into an Excel spreadsheet using a template co-produced by the SGPH project team and UWE evaluators. Data entry was conducted largely by the project team, which enhanced local ownership of data collection and monitoring, and made best use of the limited evaluation resources. We required the project team to provide an export of the anonymised data to UWE at a timely point in advance of data analysis for reporting. We analysed the data using SPSS Statistics Version 22.0 (Armonk, NY: IBM Corp.). Descriptive and inferential (where appropriate) statistics were used for the analysis of data.

4.3 Process evaluation

This component of the evaluation examined key aspects of the project implementation, drawing upon Theory of Change and Realistic Evaluation methodologies (Pawson and Tilley, 1997; Connell and Kubisch, 1998).

Development of the process evaluation plan

The first stage of this work was to develop the priorities for process evaluation with the project team and steering group. These priorities corresponded to the interests of stakeholders including participants, service developers and potential future commissioners. We suggested that priorities included understanding referral pathways, training of delivery staff, and the perceptions of key stakeholders – notably GP surgeries and other primary care agencies.

Perspectives of participants

Sampling and recruitment

The programme was delivered to four groups (Groups A-D) who started in January 2016 (Phase 1), and three groups (Groups E-G) who started in April 2016 (Phase 2). We approached participants from both phases of the programme to take part in focus groups. Those who could not attend a focus group were offered the opportunity to give one-to-one feedback.

- Phase 1 cohort: 42 out of 60 participants took part in focus groups or 1-1 interviews.
- Phase 2 cohort: 25 out of 39 participants took part in focus groups or 1-1 interviews.

Data collection tools

An interview indicative topic guide covering perceptions of the project was piloted and used for data collection. Three members of the UWE research team (MK, MJ and RE) conducted and audio-recorded the interviews and focus groups.

Data coding and analysis

Audio-recorded data was transcribed and thematically analysed using NVivo 10. Given the small scale of the evaluation, a deductive framework was used to speed up the process of data analysis. This meant that we used a list of over 25 pre-set headings to classify the transcribed data. Data coding was conducted by all members of the research team (MK, MJ and RE) and checked for consistency through comparison and discussion of preliminary findings.

Perspectives of project stakeholders

We adopted a similar process to participant data collection in our interviews with project stakeholders. We audio-recorded project management meetings, the expert panel meeting, and interviews with the GP Practice management team.

4.4 Economic evaluation

We used a similar methodology to Savas & Grady's (2013) evaluation of an Impaired Glucose Regulation (IGR) project in Manchester to identify a range of costs linked to the programme. These included costs linked to recruitment and enrolment, costs of delivering group-based education sessions, follow-on support, staff training and development, staff management, meetings, management and administration, other worker time, and other costs. The project team was asked to complete a project time and cost information questionnaire (see Appendix 3 for details).

4.5 Research ethical issues

The study was conducted in accordance with the 2005 Research Governance Framework for Health and Social Care, and the 1998 Data Protection Act. Ethical approval was first sought and obtained through South Gloucestershire Council's Research Governance Framework (SGC, 2016) in October 2015. The application was subsequently ratified by UWE Bristol's Faculty of Health and Applied Sciences Research Ethics Committee in November 2016.

South Gloucestershire Council Public Health Division were responsible for implementing most aspects of the evaluation governance. Invitation letters were sent through the GP surgeries, and the project lead was not party to any identifiable patient records or information. Interested individuals then responded directly to their local programme team, at which point they gave details such as

address and contact telephone number. They also signed a consent form after having received written and verbal information about the research from a member of the team. This included information on the handling of data and rights of withdrawal. All data on participants was collected by the project team at enrolment and subsequent points. These were held in paper and electronic format in secure environments at the project offices. Records were inputted onto locally managed, password protected project databases. The UWE evaluation team received extracts from the databases with unique ID codes, but excluding names, addresses (apart from postcodes), or any other personally identifiable information. These data are held in a password protected environment at the university.

For the process evaluation with programme participants, UWE evaluators asked for assistance from the project team to distribute an information letter and consent form to prospective participants at least one week before formally asking for consent to take part. Prospective participants were given the opportunity to ask further questions about the evaluation, informed about the management of their data and the right to withdraw from the study. Transcribed audio files were anonymised. Audio files were copied to a password protected environment at the university. A similar procedure was adopted for stakeholder interviews, although interviewees were made aware that their identities might be recognised due to their specific role in the project.

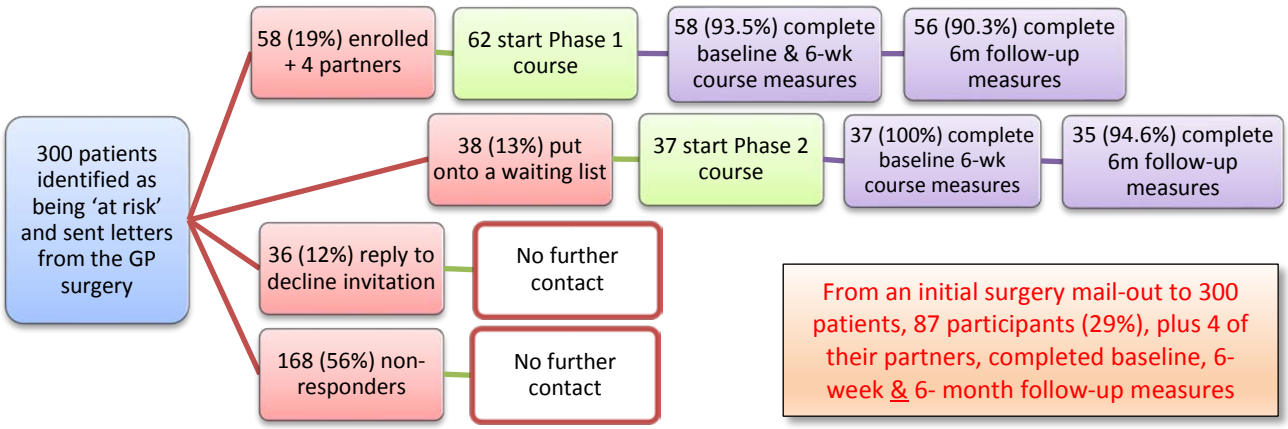
5. Outcome Evaluation Findings

5.1 Description of the study sample

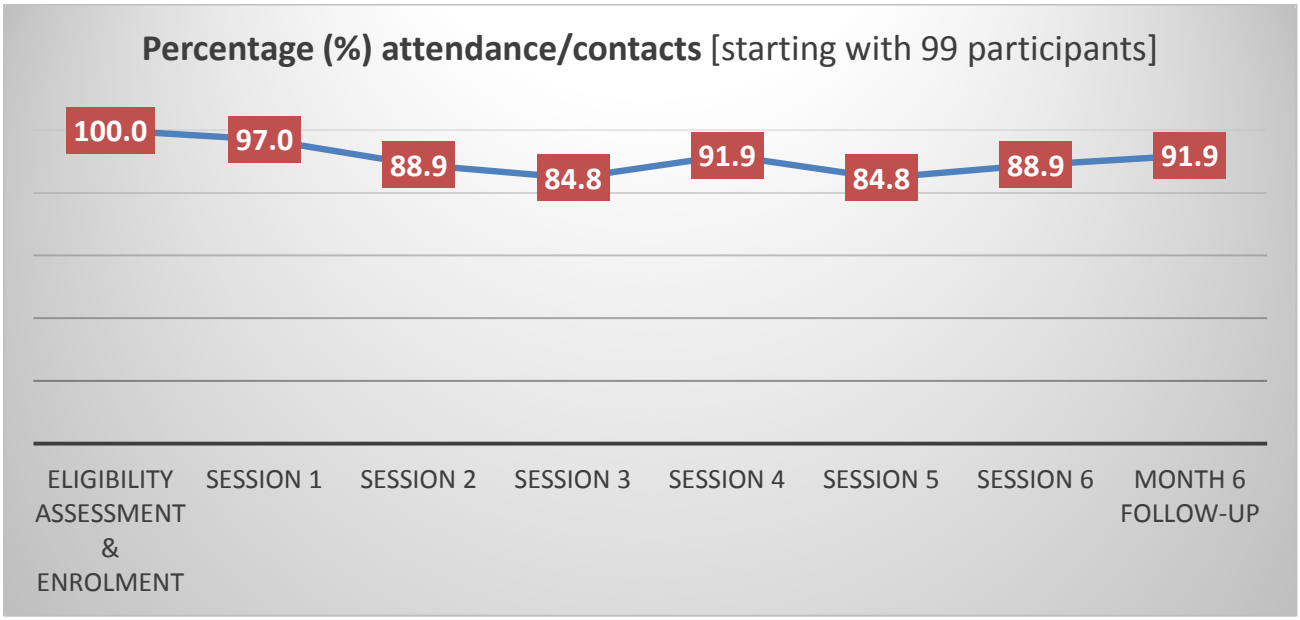
a) Recruitment to the programme

300 letters of invitation to participate in the January/February programmes were mailed out from two GP surgeries (belonging to the same practice). Approximately 19% (n=58) of those targeted were enrolled for the first phase (Jan16) along with four partners who also met inclusion criteria for raised HbA1c levels. A further 13% (n=38) were put onto a waiting list for the second phase (April16). Hence, the total number of participants starting the course was 99 (62 in Phase 1 and 37 in Phase 2).

The following flowchart gives an overview of participant recruitment and retention. This shows that out of 300 patients invited, 87 participants (29%), plus four partners completed the project at six months. Drop out from the project and evaluation was very low: of the 99 individuals starting the project only 8 (8%) did not provide six-month data.



b) Pattern of attendance at group education sessions and follow-up



At the beginning of all courses, each group started with either 15 or 16 participants. The above graph shows the pattern of attendance at each group education session and subsequent contact made with participants at the six-month follow-up. The mean attendance at group education sessions was 89 (89.9%) from a starting total of 99 enrolled participants.

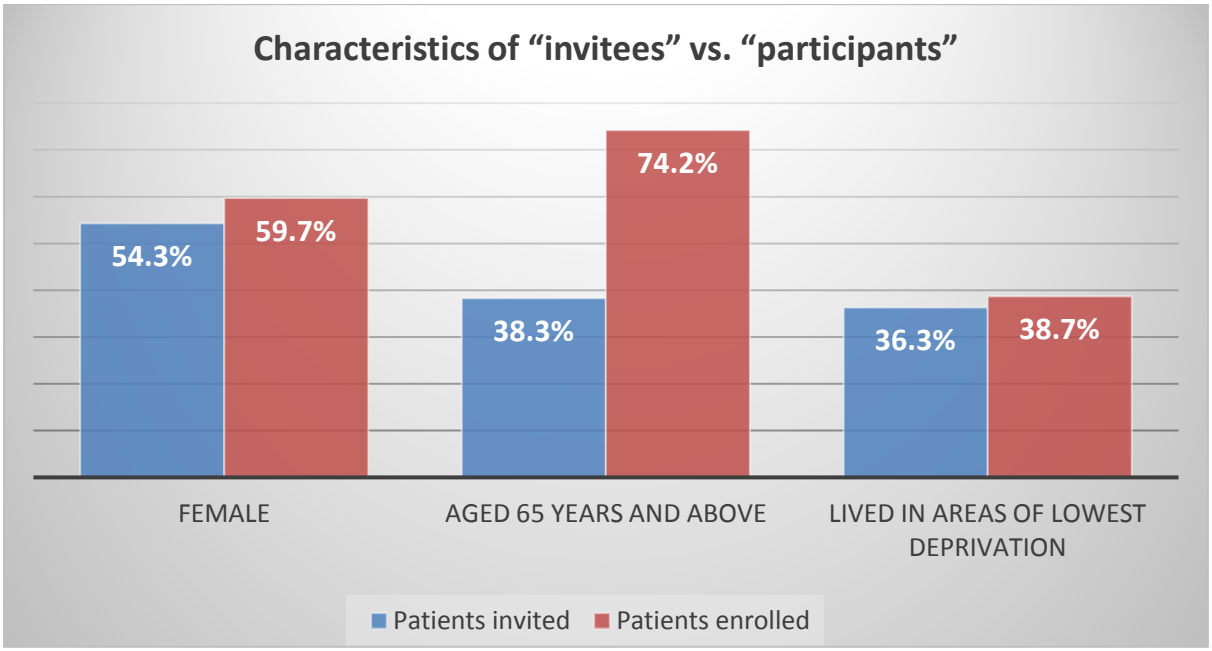
c) Contact time at group education sessions

The six structured group education sessions that were delivered over six weeks lasted approximately two hours each. The table below shows that five (5.1%) participants dropped out after Week 1 – this has been confirmed by the lead course educator. Sixty-three (63.6%) participants attended all six group sessions, i.e. 12 hours of contact time. The mean contact time at group sessions was 10.7 ± 2.4 hours.

Contact time at group sessions (hours)	Number (%) of participants
2	5 (5.1)
6	1 (1.0)
8	5 (5.1)
10	25 (25.3)
12	63 (63.6)

5.2 Programme participant demographics

Key characteristics of participants who started Phase 1 of the project (n=62) were compared to the 300 patients who received the initial invitation ("invitees"); findings are depicted in the graph below:



All participants were White British, except for one who was Asian or Asian British. The gender split was 38.4% (38) male and 61.6% (61) female. Participants ranged from 37 to 76 years of age, with 64.6% being in the '65 years and above' age bracket – the mean age was 64.5 ± 8.2 years, compared to 58.9 ± 10.6 years for "invitees". Matching the home postcode to corresponding Index of Multiple Deprivation (IMD) decile showed that the mean IMD decile for participants was 8.26 ± 2.14, compared to 7.73 ± 2.24 for "invitees" (the higher the IMD decile, the lower the area deprivation level). 52.5% (52) of participants had a family history of diabetes, while 6.6% (4) of female participants had a history of gestational diabetes. Other participant characteristics are detailed in the following table.

		Number (%) of participants
BMI categories (data missing for 3 participants)	Normal weight	5 (5.1)
	Overweight	22 (22.2)
	Obese	69 (69.7)
Employment status	Retired	68 (68.7)
	Employed	22 (22.2)
	Self-employed	3 (3.0)

	Long-term sick or disabled	2 (2.0)
	Students, carers or other	4 (4.0)
Education level	Postgraduate university	3 (3.0)
	Undergraduate university	12 (12.1)
	Some additional training	40 (40.4)
	Completed secondary school (up to 18 years)	10 (10.1)
	Completed secondary school (up to 16 years)	29 (29.3)
	Some secondary school	5 (5.1)
IMD decile* (mean = 8.26 ± 2.14)	3	2 (2.0)
	4	8 (8.1)
	5	5 (5.1)
	6	4 (4.0)
	7	14 (14.1)
	8	9 (9.1)
	9	9 (9.1)
	10	48 (48.5)
Co-morbidities	High blood pressure	34 (34.3)
	Arthritis	30 (30.3)
	High cholesterol	15 (15.2)
	Mobility problems	12 (12.1)
	Depression	11 (11.1)
	Coronary heart disease	10 (10.1)
	Stroke	2 (2.0)
	Polycystic ovary syndrome (PCOS)	2 (2.0)
	Other co-morbidities[§]	16 (16.2)
	Any co-morbidity	70 (70.7)
Prior and/or concurrent engagement with healthy lifestyle activities external to SGDPP	Weight management groups	9 (9.1)
	Exercise groups	3 (3.0)
	Swimming groups	2 (2.0)
	Yoga/relaxation groups	2 (2.0)
	Team sports	2 (2.0)
	Other activities[¶]	10 (10.1)
	Any activity	24 (24.2)
Smokers[¥]		3 (3.0)
Disabled[ç]		17 (17.2)

* IMD decile is from 1 (most deprived area in England) to 10 (least deprived area in England)
Source: English indices of deprivation 2015, Department of Communities and Local Government. Generated from postcode lookup at http://imd-by-postcode.opendatacommunities.org/

[§] Other co-morbidities reported: Alopecia, atrial fibrillation, hypo/hyperthyroidism, irritable bowel syndrome, leukaemia, vertigo, triple heart bypass, haemochromatosis, anosmia, ageusia, anxiety, coeliac disease, microscopic haematuria, Parkinson's disease, spondylolysis, osteoarthritis (OA), and multiple sclerosis (MS)

[¶] Other activities reported: Golf (x2), walking club, aqua aerobics, tai chi, gym, wood carving, epilepsy group, tennis, Gloucestershire Wildlife Trust volunteer, and heart rehabilitation group.

[¥] One participant smoked 20 cigarettes a day, another smoked 10 a day, and the other smoked two a day.

[ç] Disabilities reported: Arthritis (x7), difficulty walking (x3), spinal problems (x2), hearing loss (x2), poor breathing, psoriasis, epilepsy, below knee amputation due to motorbike accident, swelling in foot, problems in one elbow, OA, arthritis-related mobility problems (x2), knee injury, and MS.

5.3 Participant feedback on the group education sessions – course satisfaction

A total of 92 participants provided feedback on their experience of the programme at the point of completing the group education sessions. The following table shows that participants were very positive about the programme.

Did the course benefit you? *No. (%) of participants who responded 'yes'*	91 (98.9)
On a scale from 1-10, how much did you enjoy the course? [1: Not at all - 10: Very]	Mean = 9.40 ± 0.84 Range 7-10
Did the course meet your specific needs? *No. (%) of participants who responded 'yes'*	91 (98.9)
On a scale from 0-10, how much would you recommend this course to friends or family? [0:Extremely unlikely - 10: Extremely likely]	Mean = 9.65 ± 0.72 Range 7-10

5.4 Six-month follow-up results

Ninety-one participants attended the six-month follow-up, with 42 (46.2%) reporting major changes, 21 (23.1%) reporting that they have been on new medications, and seven (7.7%) reporting that they had undergone some form of operation, all in the last six months.

a) Changes in means, from baseline (T0) to six-month follow-up (T1)

	No. of participants, n	Baseline mean (SD)	6-month mean (SD)	Mean difference	Std. deviation difference	95% CI of difference
Weight (kg)	91	93.50 (16.38)	89.45 (16.28)	-4.04***	4.62	-5.01, -3.08
BMI (kg/m^2)	91	33.81 (5.95)	32.38 (6.10)	-1.43***	1.62	-1.77, -1.09
Waist circumference (cm)	91	107.37 (12.22)	102.05 (12.50)	-5.32***	5.03	-6.37, -4.27
HbA1c (mmol/mol)	91	42.24 (5.26)	38.79 (3.46)	-3.45***	4.07	-4.30, -2.60
*p<0.05; **p<0.01; ***p≤0.001						

As shown in the table above, there were significant improvements for all measures at T1 (p<0.001). A secondary analysis of change in mean HbA1c was run, excluding participants with a baseline reading below the minimum threshold value for pre-diabetes (i.e. less than 42mmol/mol) – the improvement in HbA1c observed at T1 was still statistically significant (p<0.001); results are tabled below:

	No. of participants, n	Baseline mean (SD)	6-month mean (SD)	Mean difference	Std. deviation difference	95% CI of difference
HbA1c (mmol/mol)	48	45.38 (5.29)	41.02 (2.79)	-4.35***	5.15	-5.85, -2.86
*p<0.05; **p<0.01; ***p≤0.001						

Data was analysed to assess the proportion of participants who achieved the minimum clinically important difference (MCID) of 2kg weight loss at T1 compared to T0, excluding the participant who had normal weight, i.e. BMI<25kg/m^2. Out of the 86 eligible participants, 60.5% (52) achieved the MCID. In addition, the proportion of participants who achieved a minimum percentage weight loss at T1 using thresholds widely adopted in weight loss programmes was also assessed, again excluding participants who had normal weight. Results are shown in the following table:

Percentage (n) who achieved weight loss thresholds at T1		
≥3% weight loss	**≥5% weight loss**	**≥10% weight loss**
52.3 (45)	40.7 (35)	12.8 (11)

80.2% (69) of the 86 participants who were overweight or obese, had reductions in BMI (0.06-5.85 kg/m^2). Out of the 91 participants who provided both T0 and T1 data, 82.4% (75) reduced their waist circumference (1-21 cm) and 87.9% (80) showed improvement in their HbA1c levels (1-33 mmol/mol).

b) Weight-related outcomes for participants with baseline HbA1c within pre-diabetes range, 42-47mmol/mol

The table below shows that there was significant weight loss at six-month follow-up (T1) for participants who had baseline (T0) HbA1c within the pre-diabetes range (p<0.001).

	No. of participants, n	Baseline mean (SD)	6-month mean (SD)	Mean difference	Std. deviation difference	95% CI of difference
Weight (kg)	38	98.76 (15.12)	94.17 (15.68)	-4.59***	4.65	-6.12, -3.06
*p<0.05; **p<0.01; ***p≤0.001						

Data was analysed to assess the proportion of participants who achieved the MCID of 2kg weight loss at T1 compared to T0, excluding participants who had normal weight, i.e. BMI<25kg/m^2. Out of the 37 eligible participants, 62.2% (23) achieved the MCID. In addition, the proportion of participants who achieved a minimum percentage weight loss at T1 using thresholds widely adopted in weight loss programmes was also assessed, again excluding participants who had normal weight. Results are shown in the following table:

Percentage (n) who achieved weight loss thresholds at T1		
≥3% weight loss	**≥5% weight loss**	**≥10% weight loss**
56.8 (21)	43.2 (16)	13.5 (5)

c) Changes in physical activity measures, from T0 to T1

This section is concerned with:

- The proportion of participants meeting recommended guidelines of at least 150 minutes/week of moderate-to-vigorous physical activity (MVPA) from T0 to T1 follow-up
- The mean number of minutes/week of MVPA

	Proportion of participants meeting recommended guidelines	Mean no. of minutes/week of MVPA
No. of participants, n	91	91
Baseline mean (SD)	0.16 (0.37)	189.43 (275.26)
6-month mean (SD)	0.30 (0.46)	421.66 (498.15)
Mean difference	0.13	232.23
Std. deviation diff.	0.48	488.15
95% CI of difference	0.03, 0.23	130.57, 333.89
p-value	p=0.01	p<0.001

Results show that there were significant improvements in physical activity outcomes – the proportion of participants meeting recommended guidelines of at least 150 minutes/week of MVPA increased from 16% (15) at T0 to 30% (27) at T1, while the mean number of minutes per week of MVPA increased from approximately 189 at T0 to 422 at T1.

d) Changes in diet measures, from T0 to T1

Overall and sub-categories for diet	No. of participants, n	Baseline mean (SD)	6-month mean (SD)	Mean difference	Std. deviation difference	95% CI of difference
Overall self-reported dietary behaviour	91	49.68 (7.38)	47.24 (7.46)	-2.45***	5.93	-3.68, -1.21
Substituting specifically manufactured low fat foods (max. possible score = 18)	91	11.40 (2.67)	11.41 (2.88)	0.01	2.80	-0.57, 0.60
Avoiding fat as a flavouring (max. possible score = 9)	91	5.76 (1.64)	5.47 (1.48)	-0.29	1.77	-0.66, 0.08
Modifying meats to be low in fat (max. possible score = 15)	90	7.54 (1.91)	7.23 (2.03)	-0.31*	1.30	-0.58, -0.04
Replacing high fat meats with low fat alternatives (max. possible score = 9)	91	6.52 (1.34)	6.33 (1.27)	-0.19	1.48	-0.49, 0.12
Eating fruit and vegetables (max. possible score = 15)	91	9.06 (2.37)	8.11 (2.25)	-0.95***	1.88	-1.35, -0.56
Eating cereals and grains (max. possible score = 6)	90	3.26 (1.23)	2.90 (1.17)	-0.36*	1.49	-0.67, -0.04
Choosing high-fibre foods (max. possible score = 9)	91	6.24 (1.94)	5.81 (1.83)	-0.43*	1.72	-0.79, -0.07
*p<0.05; **p<0.01; ***p≤0.001						

For diet measures, a lower score indicates healthier diet choices reported. Results show that there was a significant improvement in overall self-reported dietary behaviour for participants at T1 (p<0.001). A breakdown of analysis by sub-categories yielded significant dietary improvements for the following:

- Modifying meats to be low in fat (p=0.025)
- Eating fruits and vegetables (p<0.001)
- Eating cereals and grains (p=0.026)

- Choosing high-fibre foods (p=0.02)

e) Changes in mental wellbeing and mental health measures, from T0 to T1

This section draws upon the following measures:

- Short Warwick-Edinburgh Mental Wellbeing Scale (SWEMWBS)
- Generalised Anxiety Disorder 7-item scale (GAD-7)
- Patient Health Questionnaire (PHQ-9) for depression

	No. of participants, n	Baseline mean (SD)	6-month mean (SD)	Mean difference	Std. deviation difference	95% CI of difference
Mental wellbeing (max. possible score = 35)	91	27.59 (5.04)	27.64 (5.02)	0.04	3.61	-0.71, 0.80
Anxiety (max. possible score = 28)	91	10.00 (3.91)	9.74 (3.41)	-0.26	2.89	-0.86, 0.34
Depression (max. possible score = 36)	91	12.87 (4.93)	12.49 (4.42)	-0.37	3.19	-1.04, 0.29
*p<0.05; **p<0.01; ***p≤0.001						

For self-reported measures of mental wellbeing (SWEMWBS), the desired outcome is a higher score, whereas for measures of anxiety (GAD-7) and depression (PHQ-9), the desired outcome is a lower score. Results show that, at T1, none of the improvements observed were statistically significant (p>0.05). Participants were also asked how difficult have anxiety- and depression-related problems made it for them to do their work, take care of things at home, or get along with other people – the 0.07 ± 0.39 score improvement from T0 to T1 was similarly not significant (p>0.05). This is not surprising since mean scores suggest that participants' levels of anxiety and depression at baseline were mild.

5.5 Association between demographics and changes in means at T1

The relationships between demographic characteristics of participants and the programme outcome measures of changes in mean weight, BMI, waist circumference, and HbA1c were examined using independent-samples t-tests. Effect size statistics for any significant differences were interpreted using guidelines proposed by Cohen (1988, pp. 284-7):

0.01 = small effect
0.06 = moderate effect
0.14 = large effect

There were no significant differences across all outcome measures for participants aged under 65 years and those 65 years and over (p>0.05). However, significant differences were observed between genders and between IMD for areas lived in for the following outcome measures:

- Changes in mean weight (kg) for males (M = -5.85 ± 4.79) and females (M = -2.97 ± 4.19; t (89) = -3.00, p = 0.003). The magnitude of the differences in means (mean difference = -2.88, 95% CI: -4.78 to -0.97) was moderate (eta squared = 0.092).

- Changes in mean BMI (kg/m^2) for males (M = -1.90 ± 1.54) and females (M = -1.15 ± 1.61; t (89) = -2.17, p = 0.033). The magnitude of the differences in means (mean difference = -0.74, 95% CI: -1.43 to -0.06) was small (eta squared = 0.050).

- Changes in mean weight (kg) for participants who lived in more deprived areas (M = -5.58 ± 5.45) and those who lived in less deprived areas (M = -2.95 ± 3.58; t (59.3) = -2.60, p = 0.012). The magnitude of the differences in means (mean difference = -2.63, 95% CI: -4.65 to -0.61) was moderate (eta squared = 0.071).

- Changes in mean BMI (kg/m^2) for participants who lived in more deprived areas (M = -1.97 ± 1.89) and those who lived in less deprived areas (M = -1.04 ± 1.27; t (60.3) = -2.63, p = 0.011). The magnitude of the differences in means (mean difference = -0.93, 95% CI: -1.64 to -0.22) was moderate (eta squared = 0.072).

Associations between employment status and education level with changes in means could not be ascertained due to a lack of representativeness – the majority of participants were retired, unemployed, long-term sick or disabled (73.6%), and/or did not have a university education (86.8%).

5.6 Association between participant motivations and changes in means at T1

Participants' motivations to change behaviour in terms of physical activity and diet choices were assessed based on two measures – importance and confidence. Participants who scored 0-5 were categorised as having 'low' motivation, while those who scored 6-10 were categorised as having 'high' motivation.

Participant motivations			**Baseline**	**Month 6**
Physical activity	**Importance**	No. of participants, n	99	91
		% in 'high' category	71.7	84.6
		Range	0-10	0-10
		Mean score (SD)	7.10 (2.28)	7.62 (2.05)
		Median	8.0	8.0
	Confidence	No. of participants, n	99	91
		% in 'high' category	54.5	60.4
		Range	0-10	0-10
		Mean score (SD)	5.73 (2.82)	6.05 (2.54)
		Median	6.0	6.0
Diet	**Importance**	No. of participants, n	99	91
		% in 'high' category	92.9	95.6
		Range	0-10	2-10
		Mean score (SD)	8.39 (1.78)	8.70 (1.46)
		Median	9.0	9.0
	Confidence	No. of participants, n	99	91
		% in 'high' category	82.8	90.1
		Range	0-10	2-10
		Mean score (SD)	7.30 (1.97)	7.86 (1.72)
		Median	8.0	8.0

Participant motivations	No. of participants, n	Baseline mean (SD)	6-month mean (SD)	Mean difference	Std. deviation difference	95% CI of difference
Physical activity: importance	91	7.13 (2.30)	7.62 (2.05)	0.48	2.55	-0.05, 1.01
Physical activity: confidence	91	5.67 (2.88)	6.05 (2.54)	0.39	2.21	-0.08, 0.85
Diet: importance	91	8.46 (1.76)	8.70 (1.46)	0.24	2.13	-0.20, 0.68
Diet: confidence	91	7.34 (2.00)	7.86 (1.72)	0.52*	2.43	0.01, 1.02
*p<0.05; **p<0.01; ***p≤0.001						

Results show that there was a marginally significant increase, from T0 to T1, in the percentage of participants who felt confident to make changes in their dietary choices (p=0.046). None of the other improvements in participants' motivations were statistically significant (p>0.05). Comparisons were not made to assess the association between participant motivations on diet choices and programme outcomes due to a ceiling effect: 92.9-95.6% placed high importance on making healthier diet choices, and 82.8-90.1% had high confidence to make healthier diet choices.

Independent-samples t-tests to assess the association between participant motivations on physical activity and programme outcomes found no significant differences for changes in mean weight, BMI, waist circumference, and HbA1c between participants who had low motivation towards physical activity and those who had high motivation, whether at T0 or T1 (p>0.05).

5.7 Modelling predictors of weight at T1

Stepwise multiple regression was used to assess the ability of demographic factors to predict weight change at T1. The independent demographic variables entered were age, gender, and IMD for area lived in, based on the results from the independent-samples t-tests (see section 5.5). Results (see tables below) show that gender was the single best predictor of weight change at T1, accounting for 8.2% of the variance, F (1, 89) = 9.02, p<0.01. IMD for area lived in was the next best predictor – along with gender, it explained an additional 7.2% of the variance in weight change (F (1, 88) = 8.59, p<0.01). Age was, again, not a predictor of weight change. Adjusted R square values are reported to provide a better estimate of the true value in the relatively small sample population (n=91).

Multiple regression model summary[c]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	0.303[a]	0.092	0.082	4.42288	0.092	9.021	1	89	.003
2	0.416[b]	0.173	0.154	4.24548	0.081	8.593	1	88	.004

a. Predictors: (Constant), Gender
b. Predictors: (Constant), Gender, IMD
c. Dependent Variable: Weight change at T1

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	p-value
1	Regression	176.476	1	176.476	9.021	0.003[b]
	Residual	1741.008	89	19.562		

	Total	1917.484	90			
2	Regression	331.364	2	165.682	9.192	0.000[c]
	Residual	1586.120	88	18.024		
	Total	1917.484	90			

a. Dependent Variable: Weight change at T1
b. Predictors: (Constant), Gender
c. Predictors: (Constant), Gender, IMD

Subsequently, stepwise multiple regression was used to assess the ability of the following factors to predict weight change at T1: gender, IMD for area lived in, contact time at group education sessions, co-morbidities, and prior and/or concurrent engagement with other healthy lifestyle activities. Results confirm that gender, followed by IMD for area lived in, were predictors of weight change at T1 ($p<0.01$); the other three factors were not predictors of weight change.

The final modelling procedure was a direct logistic regression to assess the impact of gender and IMD for area lived in, on the likelihood that participants would achieve the MCID of 2kg weight loss at T1. These two control measures were chosen based on the outcome of the preceding stepwise multiple regression analysis. The full logistic regression model containing both predictors was not statistically significant, χ^2 (2, N=91) = 5.80, p=0.055. This result, therefore, suggests that gender and IMD for area lived in do not predict the likelihood that participants would achieve the MCID of 2kg weight loss at T1.6.

6. Process Evaluation Findings

6.1 Interviewee profile

Data were collected from fourteen focus groups (total of 62 participants, including two patient experts; 3-6 participants per group), five one-to-one and telephone interviews, and written feedback from one participant, between March and June 2016.

Phase	Focus groups		Number of interviews with individuals
	Number of groups	Number of participants	
1	9	Range 3-6; median = 5	3
2	5	Range 3-6; median = 4	2

6.2 Overall experiences of the programme

Participant feedback on the programme was overwhelmingly positive. The leading words used to describe the programme were 'educational', 'informative' and 'interesting.' Participants also commented on the format (e.g. 'well structured', 'planned', 'organised') and on their overall emotional responses (e.g. 'supportive', 'motivating', 'surprising', 'helpful'), for example:

> *I thought the programme was well organised and informative and encouraging.* [C]
>
> *It turned everything that I thought about upside down.* [B]
>
> *A wakeup call.* [E]

These general impressions are explored in further detail in the next sections.

6.3 Invitation to attend the programme

We asked participants to reflect back to their receipt of the initial invitation letter and their initial response. For many, the letter was a surprise, for example:

> *I was surprised because I didn't know anything about type 2 diabetes, this is not in my family and I've had quite a few health issues over the years and suddenly to get this letter and I thought, "Now what something else for me to worry about".* [A]

> *[Referring to diabetes…] Nothing, didn't know anything about it at all until the letter arrived.* [A]

> *I hadn't even considered I was diabetic or near diabetic I should say, pre-diabetic.* [B]

> *I was horrified that they would choose me to come because I go to the pool three or four times a week and I still work, and I thought I was quite healthy, it was quite a shock to find out "No you're not."* [B]

> *[I thought] "Why have they picked on me?" and I sort of came down a little bit indignant you know well I think I rang [the team] up with: "Why have you chosen me? Why am I on your hit list?"* [D]

Others, particularly with a family history of diabetes, were less surprised:

> *I wasn't [surprised] you see because I knew I was classed as obese, I knew I was in my fifties and I knew there's a history in my family.* [A]

> *Diabetes is always one I've worried about because my mum had it, her sister had it, so I've always thought "Oh you know I should be changing the way I…"* [B]

> *[It was] like a kick up the ass, I knew it was all there in my head and this just brought it out so that was like, ok, get on with it now otherwise you are going to regret it in ten years.* [A]

> *My father went through horrific problems later in life, being a diabetic. So I knew that I really had to do something about it.* [G]

Although most made contact soon after receipt of the letter, others were less sure:

> *I'm of the belief that if you're offered something for your benefit you're silly not to take it up and I think it was something for my benefit.* [A]

> *My instant reaction was to phone straight away, to make the thing to say yes please um and I don't know what I expected but I was just open to learn anything that could benefit me.* [C]

> *I got it and threw straight in the bin, it was um [my partner] that persuaded me.* [C]

> *There's been so much on the news about diabetes recently and I thought if I can learn something from it, I didn't know if I had it because I've never been tested for it. So I thought if I can learn something from it, it's got to be good.* [D]

> *I'm not very good on the phone, that's why I got my husband to do it because I seem to think hang on a minute why am I being picked on you know what's you know, am I being picked on for*

a certain thing and that's why I sort of stutter on the phone and I'm um so I got my husband to do it for me. [D]

Although some individuals did not immediately understand the criteria for selection, it appeared that all participants felt clear about these after contacting the SGDPP team. We did not receive any specific recommendations to change the wording of the letter.

6.4 Group course venue and format

The venue – its location and facilities – were rated highly by interviewees and was considered a positive factor by some individuals in attending the programme. The location in the surgery was felt appropriate by those who commented.

I think the fact that it was accessible, I don't drive you see so if I couldn't work here which I can you know I'd have to rely on my husband or a bus or something so if it had been held say at the other surgery in Yate, I'd probably wouldn't have taken it up. [A]

The duration and six-week format of the group sessions were positively received by most participants:

You feel like six weeks is sort of quite sufficient for you to know enough information to make that change that you need to. [A]

I wouldn't have minded a few more, I quite enjoyed the course. [C]

However, some felt that the course length could have been reduced in length:

I think probably the whole thing could have been done in four weeks over two hours, I would say. [F]

6.5 Group course presentation and content

The standard of the delivery of the programme was very highly rated:

I've been in teaching all my life, so I know what it's all about and I thought their presentation very, very good. [A]

I think it was done very simply and it wasn't too complicated, I didn't find it too complicated. [B]

The thing is you weren't blinded by science on the course. It was just done very nicely and you were informed, not confused. If you were confused [the educator] didn't mind trying to help. [B]

An aspect of the content that was rather problematic concerned some of the biological aspects of diabetes. The X-Pert course includes quite a lot of detail and advises educators to make use of metaphors to explain the processes. However, for at least one group, some individuals felt that these explanations were hard to understand:

I found the course, informative but there was a couple of weeks when I was, went home very confused, um a lot of information in the six weeks to take in and think about. [A]

Just probably a little bit too much information but towards the end um there was less information and we seemed to, most of us seemed to understand it a lot better you know. [E]

The lorries and things, the first week we did that I did find that confusing but I think that was the use of the terms lorries and road sweepers and I think when we went over it and recapped … it made much more sense when we were … just using the correct words. [A]

6.6 Course handbook

The course handbook was commented on very positively by a small number of interviewees. It was felt to be well organised, informative, well-illustrated and useful. The handbook was useful to consult after group sessions of specific topics. It was also a useful resource to share with friends and family, and in two cases had been passed around to a wider circle of friends.

6.7 Data collection: questionnaires and measures

No interviewees gave strongly negative feedback on the questionnaires and the biometric data collection. It appeared that the groups had been clearly informed about the importance of this data collection and the educators put time aside to explain and support participants to provide the information.

It's the price you pay for us taking up that offer… very fair. [A]

Those forms were fine. They were quite self-explanatory, I didn't have any problems. [F]

6.8 Course educators

In all focus groups and individual interviews participants had a number of positive things to say about the educators. It was evident that interviewees felt that the educators were trusted and had excellent subject knowledge of diabetes, healthy lifestyles and related aspects of illness, health and wellbeing. They also showed an ability to communicate this knowledge both 'clearly' and 'precisely'. More widely, interviewees commented on 'people skills' of the educators. Leading terms used to describe the educators were 'friendly', 'open', 'welcoming', 'not patronising', 'organised', 'humorous' and 'light hearted'.

Brilliant… what I liked …is that [the educator] is clear. She doesn't expect us to be bright youngsters who are going to pick up on the first path [she'll go over things] so we're all clear in our minds exactly what can happen and what's going on. She allows us time to discuss it and bring out views out and listen to what we're saying and tells us what we can do or not do about it. I think she's done a brilliant job. [G]

[The educator] knew her audience and you know worked towards that, she made it humorous as well as informative and she um she never talked down to us, well I never felt that she did, even though she had to go over some of the things again and again and again and again, she didn't mind at all. [B]

Individual support was provided at the beginning and end of sessions and by phone or email to discuss personal aims and issues, and points of clarification.

The use of two educators to run sessions was reported to work as a good format:

[The two educators] were a good pair and its helpful to have two people taking a session because one, when one of them starts to get, shall we say a little bit tired or needs a drink or just to sit

down, the other one takes over and then you've got to change a voice, somebody different to listen to, but they both had interesting things to say and they were interested in us. [C]

The educators used a variety of educational techniques with the group and specific individuals. This was a rather abstract subject to explore in interviews. However, some of the key techniques mentioned were:

- Helping participants set personal goals
- Advising on small incremental changes
- Checking understanding with participants
- Affirming personal value of experiences
- Using gentle humour when exploring sensitive topics
- Recapping and reframing topics
- Rehearsing topics
- Providing examples and motivational stories
- Using metaphors and visual models to explain complex topics

6.9 Course expert patient

Interviewees were largely very appreciative that an Expert Patient was willing to attend their group and share his experiences. The main message recalled concerned the importance of having an early diagnosis and early dietary change:

I think that bringing [the Expert Patient] along was superb because it's somebody who is actually experiencing it and has done for a long time and can truthfully tell you various things as he did share. Bless him, he's excellent. [G]

However, not all interviewees felt the same:

Um perhaps I shouldn't say it… but with [the Expert Patient] knowing he's had type 2 diabetes for 25 years and he's doing this course and I'm thinking "Oh my goodness [he is not well]". A personal aspect you know [was] that I didn't find him a role model for me. [A]

One suggestion was that, for future runs of the programme, more than one Expert Patient might attend specific sessions to illustrate different experiences such as the impact of diagnosis, longer term complications and making a successful lifestyle change.

6.10 Experiences of being part of a group

Overall the size of the group was felt to be about right, particularly given that there were also opportunities to talk to the educators before and after sessions. Other group members were reported to be 'interesting', 'motivating' and 'quite similar' in terms of background and circumstances: "we're all in the same boat". Interviewees commented on differences in personality, for example with regard to levels of 'chattiness', motivation, collaboration and competiveness. We were told about some examples where individuals had become friendly outside the group, but it appeared that most participants did not interact outside group sessions:

It was sort of 12 and that was it, most people you know were out the door and away home [A]

I chatted, I mean I didn't particularly sit next to one person each week, so I was sort of mixing who I sat next to. I didn't particularly form any friendships as such but everyone was, you know, really friendly and got on with everyone, and so that wasn't an issue. [F]

Nevertheless, it appeared that most individuals were broadly well disposed and respectful towards other members. Further peer support might have developed after the end of the group sessions component of the programme. We did not fully explore the role of supplementary contacts with the educators outside the group sessions.

6.11 Role of other services and support

The questionnaire-based data showed that some participants were engaged in other community and health related activities that might contribute towards diabetes prevention. Weight management groups – such as Slimming World and Weight Watchers – were the main groups mentioned. In all cases, these were compared less favourably with the SGDPP programme, for example:

I think slimming clubs are basically in it for the money you know you pay over your £5 a week and you either get a good… um I can't think what they call themselves - whoever takes the class. You can get good and bad. [A]

Apart from the commercial aspects and the standard of education, these participants commented on different dietary messages that focused on reducing fat rather than carbohydrate consumption.

6.12 Perceptions of impact on diabetes and diet related behaviours

A strong message to come from the interviews was that all participants felt that they had learned important and valuable knowledge about diabetes and associated lifestyle behaviours. This was a revelation to many individuals:

The way food is processed within the body - It's the exact opposite to anything I thought. It was very, very informative. [B]

I thought "I know about sweets and chocolates, cakes, buns that sort of thing". You don't think of the other things- the high carbohydrates food that promotes your sugar intake. [G]

Yes … I was amazed about the different carbs. [G]

Some of this insight related to understanding the meaning of blood test results:

Knowing what my number was, frightened me because I'm only just under pre, so I thought "Oh gosh, so that's made me think, we wouldn't have known that would we?" [A]

Diet related issues are a major focus for the programme and were extensively discussed in the focus groups. Some individuals expressed concerns and uncertainty about specific issues. However, it was evident that a number of key messages were clearly understood by participants including:

- Reduce consumption of highly processed carbohydrates
- Eat more vegetables and fruit as part of a balanced meal
- Reduce portion sizes
- Have planned meal times

- Read food labels before buying

Although some individuals wanted more instruction, most appeared to appreciate the self-directed approach emphasised by the educators:

> *They gave us choices and it's for us to choose. I found that much more helpful because then I think it motivated me than just being told: "Well you're fat and you need to lose weight". I'd go: "Yeah I know that."* [A]

Many were able to describe their personal types of lifestyle change they were seeking to adopt, for example:

> *I decided right, weight is obviously the answer to it, so I decided to cut down on everything. And that has helped me quite a bit, I've lost a lot weight and you know I feel better for it.* [A]

> *I've just been basically eating low carbs, so lots of homemade soup, lots of protein, very little carb wise.* [F]

> *The snacks between because they said it's good to, if you try to stick to your three meals so that your insulin levels can stabilise again between, so that's something I've purposely tried to eat breakfast, dinner and tea sort of thing so that it will stabilise between.* [C]

> *A lot like silly little things like I've alleviated completely putting sweetener or sugar on my oatmeal, just by putting a bit of cinnamon and perhaps just a few, half a dozen sultanas…* [D]

> *We've cut out our afternoon snack and we're eating different foods.* [C]

6.13 Perceptions of impact on physical activity

Participants were able to feedback on a number of key messages on physical activity that arose from the programme. Some those reported in focus groups were:

- Nearly everyone can increase their physical activity
- Don't hold off, start doing something today
- Incorporate more physical activity- especially walking- into everyday activities such as shopping and housework
- Make gradual changes to routines and increase physical activity over time
- Monitor what you do

As with diet related behaviour, participants adopted a number of personal strategies, for example one person changed what she did around the home:

> *I would say I've been trying to up my exercise and whether that be in the house, how can I put it, this is going to sound silly, um like everybody we have a bathroom and a toilet upstairs, I actually have got one downstairs so I try and use the one upstairs if I need to go, it just increases the amount of activity and the less time say even if I'm watching a programme and say the ad comes on, I'll say "right go upstairs" and do that.* [F]

Physical activity appeared to have somewhat less emphasis than dietary change during the sessions, according to a few of the focus group interviewees. One participant felt that there should have been

more emphasis and that the educators could have set a higher level of expectations (such as a weekly target) on participants.

6.14 Perceptions of other impacts

Whilst the main focus of participant feedback was on dietary and physical activity change, participants also reported wider impacts relating to general 'confidence', 'self-direction', 'feeling happy' and being 'more well', for example:

> *It's just made me more positive. I'm enjoying life, I mean when I think how old I am I don't sort of, I just sort of think get on and go and do things, its um times, there's not that much time, go out and enjoy it.* [G]

> *[For me] I feel once people understand then they are free to make their own decisions and they're much more likely to make healthy decisions when they realise the implications to themselves.* [A]

6.15 Overall value of the programme

We asked what monetary value the participants might place on the programme and whether, on reflection, they would be willing to pay for the programme if they were starting again. Most interviewees found this quite a difficult question to answer and some declined to answer. The types of responses covered:

- No charge should be made. This is an important health promotion activity that needs to be supported by GPs, the NHS, the Council and national government because it benefits patients, taxpayers and the general public.
- A charge would make it more difficult for people on low incomes to attend.
- Participants could be invited to make a voluntary donation to help boost the availability of the programme or to enhance it in some way.
- Participants should not be charged, but should be made aware of the cost per head of the programme to the NHS/PHE. This might encourage attendance and help to share the message with others.

Some participants compared the programme to the cost of Weight Watchers and Slimming World. They felt it was important that publicity emphasised that participants would learn from trained educators with knowledge of diabetes, and not just weight loss, in a setting supported by their local GP. This message would help prospective participants understand the value of the programme.

6.16 Developing the programme

No interviewee said that the programme should not be delivered in future or in other settings. Rather the overwhelming feedback was that this was a good initiative and that others would benefit from it. Whilst participants felt that the skills of the educators and the support of the GP practice were important, no one felt that the circumstances were so specific that it could not be rolled out elsewhere with other staff following similar guidance. Some recommendations for future development were:

- Make sure that educators are 'good with people' and are able to communicate with people from a variety of backgrounds.
- Make sure that educators have a good biological/medical understanding of diabetes.

- Make sure the programme is age appropriate. Different generations can have different experiences and expectations with regard to diet, information technology and education.
- Continue to invite Expert Patients, but ask for their input only on specific sessions.
- Place more emphasis on physical activity.
- Include some friendly competition or more challenging targets for the group.
- Do not dilute the programme by trying to run it with bigger groups, fewer staff or in a shorter time. If the quality of the programme is harmed this reputation will get around.

More generally a number of interviewees said that the important messages of the programme needed to be communicated in GP Practices, schools and other local setting:

> *I think a lot of this information should be in the schools for the children to learn before they leave school.* [C]

One interviewee described how he had gained a lot from the programme and had started to share his learning with a wider circle of friends:

> *I thought [the programme] was very good and I told a lot of my friends about it. When I went out, I told them about it when I went out to lunch and when I met them about four or five weeks later, I took the book with me and passed it round, so that they could see what kind of scheme it is, that we've been involved in.* [C]

7. Process Evaluation: Staff and Stakeholders

7.1 Interviewee profile

This section reports on interviews with project staff and wider stakeholders, including members of the steering group, expert panel and GP surgery team.

7.2 GP Practice management

The GP Practice team felt that the pilot was well organised - "it's been a pretty slick process" – in part due to the skills and experience of the project lead and her ability to liaise effectively with the practice team. The buy-in of the practice was essential to undertake the searches of patient records and to obtain a clear agreement on the mail-out of invitation letters. There have also been many occasions when the SGDPP team have needed some assistance, for example with regards to swiftly getting the HbA1c tests completed and feedback to participants.

The specific context at Leap Valley Surgery was very fortunate for the programme. There was clear support from the GP partners and the team who had a shared understanding that the potential value of preventative work, and the implications of failing to address rising needs ("our register of diabetics has gone through the roof in recent years"). The main premise has a new, spacious and well-equipped community room. The timing was also good, given that the surgery was not currently engaged in major external reviews, such as a Care Quality Commission (CQC) visit, and had capacity to hire out the room. The on-site diabetes management team also had a history of working with colleagues in Public Health.

The Practice team have been impressed by the take up of the programme:

I think we've been surprised by the amount of people who signed up. My expectation was that patients perhaps wouldn't want to engage with proactively addressing their lifestyle and I've been pleasantly surprised by how many. You know the fact that there was a waiting list after the first one cohort, I think we were hoping that we might scrape enough together to fill the sessions and actually we put more sessions on, so I've been really pleased, so yeah exceeded expectations.

They reported no instances of negative feedback to clinicians, and have noted the high level of attendance and obvious sense of fun and engagement the delivery team have achieved at many of the sessions. In past experiences, the team had seen how the reputation of courses spread by word of mouth, and this pilot seemed to be attracting a lot of positive interest. After the project set-up, the Practice team have not had to commit too much in the way of resources to support the project.

Actually now it's ongoing there's not a huge amount of work for us as a practice to be doing it. It was the initial set-up, so that was I guess a bit of a challenge at the start.

The SGDPP lead paid for a small amount of admin time for the letters, such as the stamps, and also paid for some phlebotomy time. The team had had two or three enquiries from patients in response to the initial invitation letter, despite the letter clearly stating all communications should be made to the Public Health and Wellbeing Division. The project team also provided briefings to the practice team and routinely let the receptionists know how the project was progressing. This engagement was felt to be very helpful and motivating for GP surgery staff who were often pre-occupied with problems. As the first practice in South Gloucestershire to implement the X-POD programme, the practice team felt that it has raised the profile of the surgery and illustrated their commitment to being proactive on preventative work.

In terms of rolling out the programme to other practices, the practice team did not feel that this would be too difficult:

There wouldn't need to be any changes, [the team] could take this programme and roll it out and roll it out. I don't think… I'm not sure, you'd have to ask her obviously that she would want to make any changes and of course with the benefit of hindsight a couple of little things…

The main issues would be training up a community of educators with the right set of skills, and building solid relationships with GP practice teams.

7.3 SGDPP staff reflections

Although we did not formally interview members of the staff team, the officer responsible for delivering the pilot project provided a detailed reflective account of her experiences. The following is summary version of this account.

The training of Educators was an intensive and quite demanding experience. At the end of the training, only those with a clinical background felt confident enough to lead group session. Consequently, the pool of available Educators was not as abundant as first anticipated, with some only confident to co deliver certain sections of each session.

GP headed paper and engagement with telephone queries were felt to be important aspects of the **invitation** process. Personal explanations of the selection process with individuals before or at the start of the course also helped clarify the project rationale and the importance of attendance. In the **early stages** of the project the intensity of course delivery – three on one day was challenging, although it enabled the team to rapidly collect evaluation data. It would be advisable to have at least two educators to manage the collection of measures on the first session.

Overall, the sessions were perceived to have gone well – usually with a lot of patient input after initial reluctance. No course cohorts were difficult – although some patients were a little more challenging in terms of their beliefs and expectations. The **expert patient's** input was helpful in terms of complications of diabetes: "this was always a sobering session, and reminded people of why they were there." It was also helpful for Educators to have a different voice in the room. As clients arrived at sessions, educators offered tea, coffee and healthy snacks to create a welcoming atmosphere.

Whilst difficult for Educators to grasp, some of the **course content** was challenging to deliver, and for the patients to receive. It was clear in some sessions that the 'biology' was difficult for many to grasp – hence we had to revisit some bits on numerous occasions. This was tricky at times, when it was clear some in the group had already grasped and understood content, but it was also vital to ensure everyone understood the messages. The injection of humour and group discussion helped to keep such sessions on track.

In the post-group course period, the project lead gave those who had attended a thank you card, and details of 'reunion' groups. These were labelled to make them sound more fun and appealing. The project lead touch with all groups via email, on a monthly basis. If group members were not on email, emails were printed out and posted to them. This was intended to help each person feel part of a group and to remind them of the course key messages. Feedback from participants was drawn upon to inform subsequent courses. A lot of the feedback via email was very positive and informative. Some examples are as follows:

> *I find them [the emails] a source of support and enjoy the communication. (#1)*
>
> *I love getting the emails! Mainly they serve as a reminder to eat less carbs and not let the group down by reverting to a high hba1c at the next meeting. (This does not always work though) but also just the information you include is very informative and refreshes my memory. Keep them coming. (#2)*
>
> *With regards to the emails I feel they are invaluable because you feel that you still belong to that unit of people you went through the course with and also you still have help available if you need it. I know we are meeting up next year and I feel the emails help to keep us as a unit of people with the same sort of medical issues who will be able to meet up if only once or twice a year to see how we are getting on. I feel if the emails go it feels that the whole group has gone but with the emails it keeps the group 'Alive' (if that makes sense). (#3)*
>
> *Just wanted to say that I think the monthly emails have a really good effect on me personally as they keep you on the right track, if I am struggling or having a bit of a bad week they sort*

me out. It's brilliant to know that you are interested in us and our welfare and giving me the words of encouragement needed. Keep up the good work (#4)

I rather look forward to your emails, they motivate me to decrease the carbs if I have slipped from the straight and narrow and whilst I have not had much success losing weight I do feel that the emails sort of re-enforce the resolve. Should anyone ask if the project was worthwhile, I would not hesitate to confirm that it was and would recommend that attending this course is beneficial and educational. I also found the social side of this project was very pleasant. Look forward to the next email. (#5)

Partnership working has been key to the success of the initiative. The local authority have worked alongside the South Gloucestershire CCG, UWE, Sirona, the voluntary sector, LTC clinical group and primary care and the UWE evaluation team. Similarly, the DSN's based at Leap Valley have been extremely supportive throughout, both in terms of delivery time and upskilling myself and other Educators.

X-PERT have been a very supportive organisation to work alongside. They responded quickly to queries and offered support and guidance. Colleagues at the CCG have provided guidance and strategic input, and have really invested time and energy into making this a success. Staff at the surgery have worked alongside the project at each stage, really helping to increase attendance – staff speak highly of the project to patients, prompting interest. Some staff have also referred patients into the programme. Managerial support has also been crucial, and would have been extremely difficult without a manager who understands the process and supports throughout – even training as an Educator and delivering sessions! Any future rollout should have a robust management team

The project lead summarised the key lessons as follows:

- *Partnership working is invaluable. Cannot overestimate the value of investing time into building solid foundations for any course delivery with all stakeholders involved. Support from stakeholders is very important to success of the project for those involved in the delivery process*
- *Educators should be confident to deliver, possibly with a clinical background*
- *Two educators to deliver each session if possible.*
- *Patients who respond to a letter/make initial contact are likely to attend sessions – more so than those patients who may be advised to attend a course by a clinician. Possibly because they have had time to consider a letter/make a decision to contact, rather than feeling coerced into attendance by a clinician. Letters well received on GP headed paper*
- *We had a mostly white population who attended the group (one Asian participant). Consideration should be given to future courses which may have more diverse ethnic mix to ensure the resource/information provided meets requirements*
- *Learning styles are different for everyone. A course which provides a variety of learning styles would be best. Also, a course which delivers an understandable biological message – the*

biology is important as it really helps participants to understand WHY they are at risk, and WHAT they can do to improve things – but mustn't risk losing patients along the way who struggle with such content.

- *It may be helpful to have a patient representative/peer supporter at future sessions where possible – not every session, but in particular those which talk about complications of diabetes – or at the first session, maybe having someone talk about their experience of doing the course?*

- *Patients seemed to like the resources they received (books, tape measure, food labelling guides). It was great to be able to give them something practical.*

- *Provision of tea/coffee/healthy snacks is a good idea – both for modelling, and for showing appreciation to those who are attending*

- *Patient engagement is key at every stage. The initial contact is crucial so the letter of invite should be carefully worded. Continued patient contact beyond six weeks is also* ***essential*** *for patient motivation and support – crucial within the period when they may feel uncertain or demotivated. The work really begins when they end the course!*

7.4 Expert panel

On 23rd September 2016, we convened an expert panel to discuss the preliminary findings based upon the Phase 1 outcome evaluation data, the initial analysis of participant focus groups and individual interview data, and an early economic assessment. The main focus of discussion was the implications of the pilot project and its evaluation for the local delivery (in Bristol, North Somerset and South Gloucestershire, BNSSG) of the NHS National Diabetes Prevention Programme (NHS DPP). According to a recent patient data search, 20,000 people in the BNSSG area would be eligible for the programme, based on an HbA1c reading of 6.0-6.4%, recorded in the last 12 months.

Some of the key issues identified by the expert panel were:

- Careful management of case finding procedure at the level of GP surgeries and, given the resources involved, the potential need to identify additional funding to support this work
- The need for flexibility in the programme design to meet local needs
- Importance of appropriate communication or dissemination of information
- Constant personalised communication between the project lead and programme participants was a major factor in achieving good retention rate for the six-month follow-up
- Setting up a mechanism to try to encourage maintenance of participants' motivation for behaviour change after exiting the programme, e.g. a newsletter, blog, social media, etc.
- Information delivered by various providers about diabetes prevention needs to be consistent
- Residents in the BNSSG area need to be informed about the availability of a diabetes prevention programme in their locality, to avoid potential negative reactions to any invitation letters sent out
- The importance of behaviour change support systems
- The importance of peer-to-peer support

- The added value in terms of support from Diabetic Specialist Nursing Service, i.e. Sirona Care and Health
- The importance of coordinating prevention programme work with similar services, such as existing weight management, exercise referral and social prescription projects
- The programme needs to be able to achieve similar positive outcomes in the black and minority ethnic (BME)/inner city population

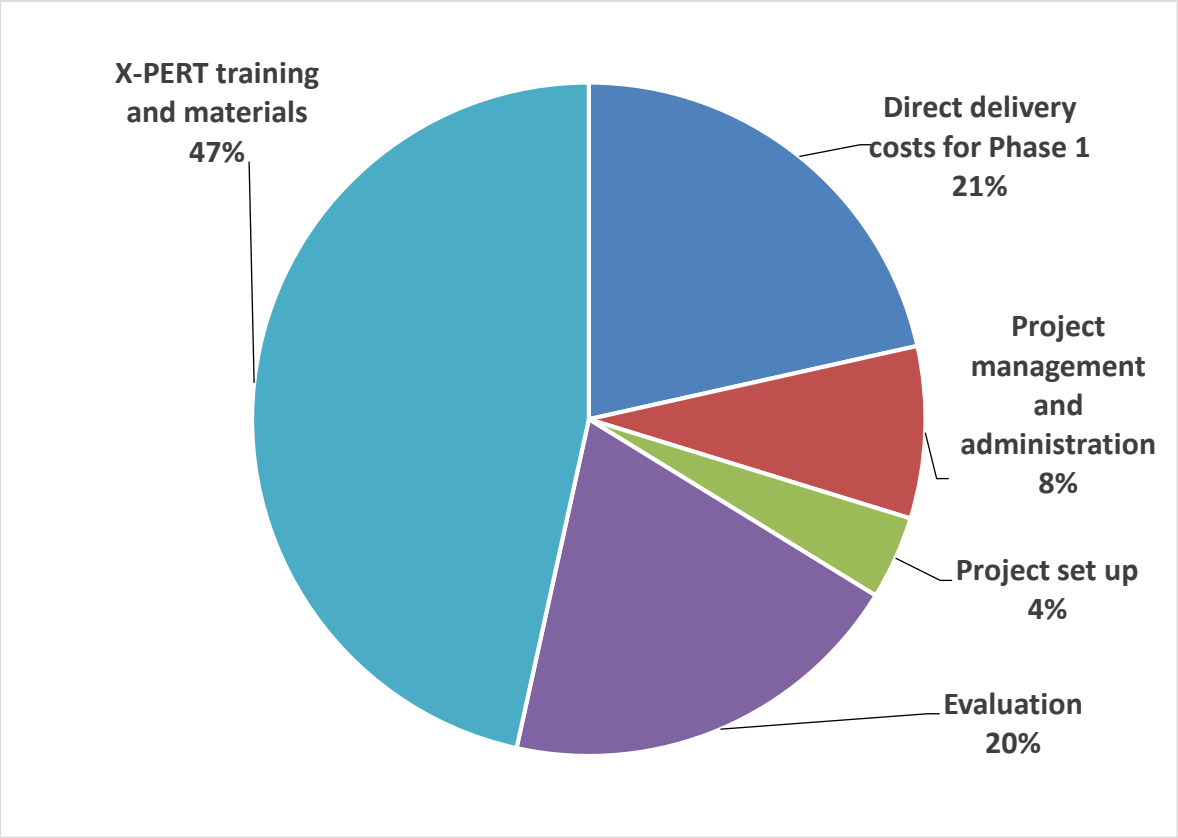
Overall, the expert panel discussion focused on how the SGDPP pilot provided a useful basis for understanding the issues involved in scaling up a prevention programme in the BNSSG area.

8. Economic Evaluation

We used a similar methodology to Savas & Grady's (2013) evaluation of an Impaired Glucose Regulation (IGR) project in Manchester to identify a range of costs linked to the programme. These included costs linked to recruitment and enrolment, costs of delivering group-based education sessions, follow-on support, staff training and development, staff management, meetings, management and administration, other worker time, and other costs.

Total cost for initial rollout and delivery of the first four courses was estimated to be £28,735. This included project set-up costs, management and administration, X-PERT training and materials, evaluation, and costs to delivery partners (see Appendix 3 for further details).

Chart 2: Costs of SGDPP from project inception to Month 6 for Phase 1 [total cost of £28,735]



A significant fraction of these costs was from one-off set-up costs and would not be incurred in a later rollout of the programme. The following table assumes that unit costs can be calculated on the basis of 58 clients who completed the programme to the point of six months. The analysis factored in a number of cost elements and showed a unit cost range from £107 to £495.

Table: SGDPP unit cost sensitivity analysis

Description	**Cost**	**Unit cost** (Cost/58 clients)
All project costs	£28,735	£495
Project set-up + Direct delivery + Management and administration + Evaluation	£15,357	£265
Project set-up + Direct delivery + Management and administration	£9,704	£167
Direct delivery + Management and administration	£8,552	£147
Direct delivery only	£6,179	£107

For context, Public Health England states that the NDPP intervention cost is estimated to be £270 per person. Local expenditure in case finding and referring individuals to the programme is not included in this figure (PHE, 2016, p.35). It should be noted that this figure is based on the delivery of an 18-month programme, with most costs incurred in the first six months of delivery.

9. Discussion, Conclusions and Recommendations

9.1 Main themes arising from the evaluation

This evaluation consisted of a before and after assessment of the biometric (weight, BMI, HbA1c) and self-reported psychosocial outcomes of participants in the 2016 SGDPP pilot. This was accompanied by a process evaluation of perceptions of the programme by participants, project staff and wider stakeholders, and a unit cost economic evaluation. This was a small-scale and short-term evaluation that depended upon a close collaboration between the SG delivery team and UWE Bristol researchers. Although the evaluation only tracked participants' progress up to six months and overall programme delivery over 12 months, the research identified a number of highly promising aspects of the pilot. Feedback and patterns of retention suggest high acceptability of the initiative from the perspectives of the GP surgery team and associated health and community services, and from participants themselves. The scheme exceeded its initial recruitment, delivery and retention targets. The outcome data shows that the programme is associated with positive changes in weight, HbA1c, diet, and physical activity measures. These results are widely distributed by demographic characteristics, and not confined to specific types of participants.

The qualitative data suggests that the organisation, clarity of goals and personal qualities of the delivery team were essential aspects of the programme's success. These features appear to have supported the strong uptake and retention on the programme, satisfaction with the group elements, and commitment of participants to achieve goals that directly reduce their risk of diabetes. The X-POD programme appears to have been, broadly, well received and has underpinned what was

perceived to be valuable new knowledge for participants. Positive elements of participant feedback can be summarised as follows:

- personal relevance and importance of the programme
- overall clarity of the key messages
- perceived influence of the programme on knowledge, skills, attitudes, motivations to change, confidence to manage risk
- personalised support on specific matters
- 'professional' handling of sensitive issues
- skills ('soft' and 'hard') of group educators
- format and organisation of the programme
- value of being part of a group, opportunities for participation
- shared learning beyond the group: family, friends and acquaintances
- diabetes prevention is a very important message communicate in South Gloucestershire, not just with at-risk groups, but with the wider public (including children) and professionals
- some participants felt motivated to help professionals in this work

Participants and stakeholders felt that some areas to consider for developing the programme included:

- initial GP letter of invitation: the challenge of how address reactions and queries
- adjusting contents of the programme
    - complexity of biological/medical education on diabetes
    - complexity of the dietary advice
    - emphasis on physical activity (PA)
    - emphasis on behaviour change techniques
- refining roles: expert patient, co-facilitators (especially regarding PA)
- longer term development: networking, support and community-based activities

Overall, the pilot was very well received by the main participating GP surgery, and staff anticipated that the initiative could be readily adopted in similar settings provided there were similar resources, project staff skills and preparatory activities with the surgery. The setting for the pilot was not an area of high social deprivation or high racial-ethnic diversity, which means that the programme may need further adaptation or revision if delivered in areas with a different demographic profile.

The start-up unit costs of the SGDPP appear to be similar to other pilot intensive preventative lifestyle programmes. We would anticipate that these costs would decline over time as delivery becomes embedded at the local level. However, as the NHS DPP programme guidance emphasises, retention and adherence to NICE programme delivery guidance are critical factors in achieving cost effectiveness.

9.2 Strengths and limitations of the study

This is a small-scale evaluation of a pilot programme. The before and after study design does not allow us to compare participants' outcomes with normal care. However, it does allow for tests of association between baseline and follow-up characteristics, and to assess the role of demographic

and programme linked variables in predicting retention. The process evaluation component has had an important role in helping to develop an account of how and why the programme may be contributing towards its stated goals and the context within which the programme was implemented. It is nevertheless, important to be aware that the study only provides a limited insight into the outcomes of the programme if it was scaled up and replicated in other settings.

9.3 Recommendations

There are a number of recommendations arising from this evaluation:

1. South Gloucestershire Public Health & Wellbeing Division and NHS South Gloucestershire CCG should consider the value of maintaining contacts with participants and collecting 12 months post-enrolment data. Apart from providing evidence of longer-term outcomes, this work will help provide local insight into patterns of retention and the resources involved in maintaining longer-term contacts with participants.
2. The SGDPP delivery team should be supported to consolidate and package their learning to relay on to other parties. Apart from helping to embed best practice locally, this work can be used to support and advise the service provider commissioned to deliver the Bristol, North Somerset, and South Gloucestershire (BNSSG) rollout of the NHS DPP.
3. Intensive lifestyle programmes such as the SGDPP should have continuity of support from specific educators, and there should be a clear focus on building friendly and supportive group dynamics.
4. In order to add local value and develop sustainable community services, intensive lifestyle programmes such as the SGDPP need to delivered in parallel with other community-based lifestyle initiatives and self-care programmes.
5. Intensive lifestyle programmes such as the SGDPP should be coordinated with wider population health and related communication campaigns, such as those delivered through local food strategies and annual public health events.
6. A minority of participants in programmes such SGDPP are likely to be willing to act as local champions, representatives, activists and expert patients. Local and national diabetes prevention initiatives can benefit through working in partnership with such volunteers.

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Appendix 1: Invitation Letter

Department for Children, Adults and Health

Dear …….

Leap Valley Surgery in Downend is currently working in partnership with the Public Health and Wellbeing Division within South Gloucestershire Council to identify and support individuals who are potentially at risk of developing Type 2 Diabetes.

Following a recent review of patients at your surgery, you have been identified as being 'at risk' of developing Type 2 diabetes. This does not mean you have diabetes now, or will definitely develop it, but there is some concern about your raised risk.

We are therefore pleased to invite you to join a pioneering new six week Diabetes Prevention course at Leap Valley Surgery, starting in January 2016.

The **X-POD course** is designed to increase your knowledge, skills and confidence to make lifestyle changes that will reduce your risk of developing diabetes. It is the only course of its type currently offered within South Gloucestershire, and as such is a great opportunity.

To book your place on the course, please phone XXX on TelXXX or email XXX @southglos.gov.uk. If you do not want to take advantage of this free programme, please could you also let us know? Alternatively, if you would like to find out more, or have any queries, please contact XXX on XXX/ XXX@southglos.gov.uk.

****Please do not contact your surgery as all bookings are being handled by the Public Health and Wellbeing Division within the local authority****

Yours sincerely

Name **XXX**

Job Title Diabetes Prevention Officer

South Gloucestershire Council

FAQ's

What is Type 2 Diabetes?

Most food we eat is turned into glucose (sugar) for our bodies to use as energy. Glucose enters the cells in our body with the help of insulin. The pancreas, an organ that lies near the stomach, produces the insulin we need. Type 2 Diabetes develops when your body cannot produce enough insulin, or when the insulin that is produced does not work properly. This causes sugars to build up in the blood. Left untreated, this can cause very serious health complications.

What makes me at risk?

There are many factors which increase a person's chance of developing Type 2 Diabetes. Some of the more common ones include:

- **Age** – being over the age of 40 (over 25 for South Asian people)
- **Genetics** – having a close relative with the condition (parent, brother or sister)
- **Weigh**t – being overweight or obese
- **Ethnicity** – being of South Asian, Chinese, African-Caribbean or black African origin (even if you were born in the UK)

Other risk factors include **family history of diabetes, polycystic ovary syndrome, raised blood pressure or cardio-vascular disease**. If you fall into one or more of the above categories, your risk of developing Type 2 diabetes is raised.

What can I do?

Call or email to book your place on the diabetes prevention course! Attending the X-POD course at your surgery will enable you to look at your lifestyle, and to understand better where you may be able to make some small changes to improve your chances of never developing type 2 diabetes. Courses are friendly and informal, with a maximum of 15 per group.

How will I benefit from attending?

The programme offers you the opportunity to explore how your body works and how lifestyle modifications may help to reduce your risk of developing diabetes. The aim is not to tell you want you should and shouldn't do, but to help and support you in setting realistic goals. Any concerns you may have with your lifestyle such as what you eat and how active you are can be addressed. Possible benefits from attending are:

- reduced risk of diabetes
- weight loss
- healthier eating
- increased energy levels
- improved fitness
- improved wellbeing and quality of life
- lower blood pressure
- lower blood cholesterol
- reduced risk of heart disease and other long-term conditions

When is the course?

Courses start on Wednesday 27th January at Leap Valley surgery, and you can choose to attend either Wednesday mornings (10am – 12noon) or Wednesday evenings (5pm – 7pm) for six weeks. Ideally you should be able to attend all six sessions. Please note – the first session will be slightly longer to allow for height/weight/BP measurements to be taken

The course is free to attend, refreshments are provided and you will also receive some handy resources to help you at home.
If you are unable to attend the course, but would be interested in alternative dates, please call XXX

Privacy Notice

Keeping Your Information Safe
In order to support your care, healthcare staff maintain records about you. We take great care to ensure your information is kept securely and used appropriately.

Information we hold about you

- Your name, address and contact details
- Records about recent blood glucose checks, height and weight

Consent to sharing your information
To save you having to give your information every time you attend our structured education programme, we will ask for consent to share your information with your GP practice.

When information is shared, it is passed securely and kept confidentially by the people who receive it.

Sharing information with other organisations
We will also ask for consent to share some details with colleagues at the University of the West of England (UWE), who will be evaluating this project. This will be discussed with you at the first session, and you will be asked to read and complete a consent form and questionnaire. Your name will be removed from any data we share with UWE, and as such is anonymised.

Other pre course tests
Before commencing the course, we will ask you to have an HbA1c blood test (if you have not had one within in the last three months) with the phlebotomist at Leap Valley Surgery. Once you have enrolled on the programme, we will ask you to call the surgery to arrange an appointment to have this done.

At the first group session we will ask to record your height, weight and blood pressure. This will be done sensitively, and not within the group setting.

The above tests are essential for us to be able to record your progress on the course.

Post course tests
In order for us to assess the effectiveness of the programme we are offering, we will ask you to complete further questionnaires at 6 and 12months.

We will also retake HbA1c blood tests, weight and height measurements and blood pressure.

If you have any concerns about any of the above, or would like further clarification, please contact XXX

Appendix 2: Questionnaire

SOUTH GLOUCESTERSHIRE DIABETES PREVENTION PROJECT (SGDPP): CORE DATASET

Participant identifiers (Office use only)

Project & Cohort ID	
Participant ID number	
Date (of questionnaire)	
Time point (please tick)	Baseline / Six months / 12 months

Biometric information (Office use only)

Has the participant been diagnosed with diabetes, pre-diabetes, or other diagnosis? (please circle)	Diabetes / Pre-diabetes / Other [please state]
Date of diagnosis – diabetes or pre-diabetes (DD/MM/YYYY)	
Is the participant on metformin? (Yes / No)	
Weight (kg)	
Height (cm)	
BMI (kg/m^2)	
Blood pressure (mmHg)	
HbA1c (mmol/mol or %) Date of HbA1c measurement (DD/MM/YYYY)	

Participant information

Title	
First name	
Family name	
Name known as	
Gender (please circle)	Male / Female
Date of birth (DD/MM/YYYY)	
Address	
Postcode	
Contact number	
Email	
Signature regarding consent statement	"I am happy for the information that I have given in this questionnaire to be used to evaluate and improve the activity [course or other term as appropriate]. I understand that any information I provide will be stored securely and kept confidential in line with the Data Protection Act 1998."

Date (DD/MM/YYYY)	
Race / Ethnicity (please circle)	Short version: White / Black or Black British / Asian or Asian British / Mixed / Chinese / Other [please state] Long version: White – British White – Irish Any other White background Black or Black British – Caribbean Black or Black British – African Any other Black background Asian or Asian British – Indian Asian or Asian British – Pakistani Asian or Asian British – Bangladeshi Any other Asian background Mixed – White and Black Caribbean Mixed – White and Black African Mixed – White and Asian Any other Mixed background Chinese Any other ethnic group [please state]
Employment status (please tick any that apply)	Employed / Carer / Retired / Self-employed / Student / Unemployed / Long-term sick or disabled / Other [please state] / Not disclosed
What is the highest level of education that you have completed? (please tick the highest level you have completed)	Primary school Some secondary school Completed secondary school up to 16 years Completed secondary school up to 18 years Some additional training (apprenticeship, BTEC courses etc.) Undergraduate university (degree) Postgraduate university (Masters degree or PhD)
Family history of diabetes	Yes / No
History of gestational diabetes	Yes / No / Not applicable
Long-term condition (please tick any that apply)	Hypertension / Stroke / Coronary heart disease / High cholesterol / Chronic kidney disease / Polycystic ovary syndrome / Arthritis / Mobility problems / Depression / Other [please state]
Smoking status	Do you smoke? Yes / No If yes, how many per day?
Do you have any disabilities? (please tick) If yes, please state.	Yes / No
Are you taking part in any OTHER activity groups to support your health? (please tick any that apply) Do not include this project.	Exercise group / weight management group/ cooking group / swimming group / team sport / yoga or relaxation group / mental health support group / Other [please state]

Physical activity

The following questions ask you about the time you spent being physically active in the last 7 days.

By 'active' we mean doing anything using your muscles. Think about activities at work, school or home, getting from place to place, and any activities you did for exercise, sport, recreation, or leisure. You will be asked separately about brisk walking, moderate activities, and vigorous activities.

Walking

1. During the last 7 days, on how many days did you *walk at a brisk pace*?

A brisk pace is a pace at which you are breathing harder than normal? This includes walking at work, while getting from place to place, at home and at any activities that you did solely for recreation, sport, exercise, or leisure.

Think only about brisk walking done for at least 10 minutes at a time.

Write in, put '0' if none *Days (per week)*

2. How much time did you typically spend walking at a brisk pace on each of those days?

Write in hours minutes

Moderate physical activity

1. During the last 7 days, on how many days did you do moderate physical activities?

'Moderate' activities make you breathe harder than normal, but only a little – like carrying light loads, bicycling at a regular pace, or other activities like swimming or social tennis. *Do not include walking of any kind*.

Think only about those physical activities done for at least 10 minutes at a time.

Write in, put '0' if none *Days (per week)*

2. How much time did you typically spend on each of those days doing moderate physical activities?

Write in hours minutes

Vigorous physical activity

1. During the last 7 days, on how many days did you do vigorous physical activities?

'Vigorous' activities make you breathe a lot harder than normal ('huff and puff') – like heavy lifting, digging, fast bicycling, or other activities like running or playing football.

Think only about those physical activities done for at least 10 minutes at a time.

Write in, put '0' if none *Days (per week)*

2. How much time did you typically spend on each of those days doing vigorous physical activities?

Write in hours minutes

Frequency of activity

Thinking about all your activities over the last 7 days (including brisk walking), on how many days did you engage in:

At least 30 minutes of moderate activity (including brisk walking) that made you breathe a little harder than normal, OR

At least 15 minutes of vigorous activity that made you breathe a lot harder than normal ('huff and puff')?

Write in, put '0' if none *Days (per week)*

Physical activity motivations

The following questions are about your motivations to achieve a healthy level of physical activity on a scale from zero (not at all) to ten (extremely).

A healthy level of physical activity is doing at least 30 minutes of moderate intensity physical activity on 5 or more days per week.

Please circle the number that best describes how you feel on each line.

How important is it for you to achieve a healthy level of physical activity? (0 =not at all, 10=extremely)

0 1 2 3 4 5 6 7 8 9 10

How confident are you about being able to achieve a healthy level of physical activity over the next month? (0 =not at all, 10=extremely)

0 1 2 3 4 5 6 7 8 9 10

Diet

The following is a list of ways to reduce the amount of fat or increase the amount of fibre in your diet.

Please tick the box that best describes how often you do the following. If you do not include the foods listed below in your normal diet, please tick 'not applicable'.

Substitute specifically manufactured low fat foods	Usually or always	Sometimes	Rarely or Never	Not applicable
1. Eat frozen yogurt or low-sugar sorbet instead of ice cream?				
2. Use low-calorie or low-fat salad dressing instead of regular?				
3. Use yogurt instead of cream?				
4. Eat low-fat cheese instead of regular cheese?				
5. Drink semi-skimmed, skimmed, or 1% milk instead of whole milk?				
6. Use spray oil instead of oil, margarine or butter?				

Avoid fat as a flavouring	Usually or always	Sometimes	Rarely or Never	Not applicable
7. Eat potatoes without oil, butter or margarine?				
8. Eat bread or toast without butter or margarine?				
9. Avoid adding butter, oil, or margarine to vegetables?				

Modify meats to be low in fat	Usually or always	Sometimes	Rarely or Never	Not applicable
10. Take the skin off chicken?				
11. Eat grilled meat, rather than fried?				
12. Trim the visible fat from your meat?				
13. Eat small portions of meat?				
14. Eat baked, grilled or steamed fish, rather than fried?				
Replace high fat meats with low fat alternatives	Usually or always	Sometimes	Rarely or Never	Not applicable

15. Eat beans (e.g., kidney beans, chickpeas) and/or pulses (e.g., lentils) instead of meat?				
16. Eat egg whites and/or low-fat cottage cheese instead of meat?				
17. Eat fish, chicken or turkey instead of red meat?				

Fruits and vegetables	Usually or always	Sometimes	Rarely or Never	Not applicable
18. Eat raw vegetables or fruit as part of a snack?				
19. Eat fruit as part of your breakfast?				
20. Eat a vegetable or fruit as part of your lunch?				
21. Eat two or more vegetables as part of your dinner?				
22. Eat fruit for dessert?				

Cereals and grains	Usually or always	Sometimes	Rarely or Never	Not applicable
23. Eat high-fibre cereals (e.g., All Bran, Bran Flakes, Quaker Oats, Shredded Wheat, Weetabix, Oatmeal) instead of low-fibre cereals (e.g., Cornflakes, Rice Krispies)?				
24. Eat whole-grain crackers (e.g., Ryvita whole-grain crackers) or whole-grain bread (e.g., wholemeal, granary, brown) instead of white bread or regular crackers?				

Substitute low-fibre foods for high-fibre foods	Usually or always	Sometimes	Rarely or Never	Not applicable
25. Eat whole-wheat (brown) pasta instead of regular pasta?				
26. Eat brown rice instead of white rice?				
27. Eat the skin on potatoes?				

Healthy eating motivations

The following statements are about your motivations to eat a healthier diet on a scale from zero (not at all) to ten (extremely).

A healthier diet is one that is low in fat, low in saturated fat, and includes plenty of fruit and vegetables, and plenty of starchy foods.

Please circle the number that best describes your feelings on each line.

How important is it for you to eat a healthier diet? (0 =not at all, 10=extremely)

0 1 2 3 4 5 6 7 8 9 10

How confident are you about being able to eat a healthier diet over the next month? (0 =not at all, 10=extremely)

0 1 2 3 4 5 6 7 8 9 10

Thoughts and feelings

Below are some statements about your thoughts and feelings. Please tick the box that best describes your experiences of each over the last two weeks.

	None of the time	Rarely	Some of the time	Often	All of the time
1. I've been feeling optimistic about the future					
2. I've been feeling useful					
3. I've been feeling relaxed					
4. I've been dealing with problems well					
5. I've been thinking clearly					
6. I've been feeling close to other people					
7. I've been able to make up my own mind about things					

	Not at all	Several days	More than half the days	Nearly every day
1. Feeling nervous, anxious or on edge				
2. Not being able to stop or control worrying				
3. Worrying too much about different things				
4. Trouble relaxing				
5. Being so restless that it is hard to sit still				
6. Becoming easily annoyed or irritable				
7. Feeling afraid as if something awful might happen				
8. Little interest or pleasure in doing things				

9. Feeling down, depressed, or hopeless				
10. Trouble falling or staying asleep, or sleeping too much				
11. Feeling tired or having little energy				
12. Poor appetite or overeating				
13. Feeling bad about yourself — or that you are a failure or have let yourself or your family down				
14. Trouble concentrating on things, such as reading the newspaper or watching television				
15. Moving or speaking so slowly that other people could have noticed? Or the opposite — being so fidgety or restless that you have been moving around a lot more than usual				
16. Thoughts that you would be better off dead or of hurting yourself in some way				

If you checked off any problems <u>on this page</u>, how difficult have these problems made it for you to do your work, take care of things at home, or get along with other people?

Not difficult at all	Somewhat difficult	Very difficult	Extremely difficult
☐	☐	☐	☐

Appendix 3: SGDPP Evaluation Time and Cost Information

The following is representative of cost to deliver to the first four groups (i.e. Phase 1) to go through the Diabetes Prevention Pilot Project (January 2016 – March 2016). Some costs will be 'one off' and would only be incurred at the first phase of rollout. These costs would not be repeated should the programme roll out.

Each session was delivered by two Educators. These Educators varied in grading/ banding so each course (A – D) has been priced separately, then a mean cost applied.

There have been five steering group meetings, each of two hours, with various attendees from CCG, Sirona, UWE, community and Public Health. These have been difficult to add a value to due to the difference in cost for each attending. However, we have averaged that mean attendance = 7. Average salary for each attendee estimated approx. £20 p/h = £280 per steering group x 5.

The total cost for initial rollout and delivery to four courses was calculated as £28,735.31.

£

Project set-up costs

Staff	Activity	Time (minutes	Staff pay band [hour]	Costs
S Glos Admin/Finance/IT	[Included below]			
PH Lead for Obesity, Nutrition & Physical activity	Bid for initial pilot funding	14 hours	Hay 3 (£21.54 p/h)	£301.56
PH Lead for Obesity, Nutrition & Physical activity	Initial research into DPP	2.5 hours	Hay 3 (£21.54 p/h)	£53.85
PH Lead for Obesity, Nutrition & Physical activity	Contact with Exeter Uni	1.5 hours	Hay 3 (£21.54 p/h)	£32.29
PH Lead for Obesity, Nutrition & Physical activity	Evidence Review	5 hours	Hay 3 (£21.54 p/h)	£107.70
PH Lead for Obesity, Nutrition & Physical activity	Presentation of draft project plan	2 hours	Hay 3 (£21.54 p/h)	£43.08
PH Lead for Obesity, Nutrition & Physical activity	Contact with IT CCG Lead	1 hour	Hay 3 (£21.54 p/h)	£21.54
PH Lead for Obesity, Nutrition & Physical activity	Contact chief officer Avon LPC	20 mins	Hay 3 (£21.54 p/h)	£7.18
PH Lead for Obesity, Nutrition & Physical activity	Recruitment process of project manager	17 hours	Hay 3 (£21.54 p/h)	£366.18
PH Lead for Obesity, Nutrition & Physical activity	Initial contact/calls/emails to X-PERT	4 hours	Hay 3 (£21.54 p/h)	£86.16
PH Lead for Obesity, Nutrition & Physical activity	Visit to LEAP Valley Surgery/GP	2 hours	Hay 3 (£21.54 p/h)	£43.08
PH Lead for Obesity, Nutrition & Physical activity	Initial first report to HESW	2 hours	Hay 3 (£21.54 p/h)	£43.08
PH Lead for Obesity, Nutrition & Physical activity	Work with Performance and commissioning officer on initial contract between UWE and SGC	1.5 hours	Hay 3 (£21.54 p/h)	£32.29
PH Lead for Obesity, Nutrition & Physical activity	Initial meetings regarding budget	40 mins	Hay 3 (£21.54 p/h)	£14.36
				£1,152.35

X-PERT training and materials

Activity	Time (minutes	Staff pay band [hour]	Costs
Diabetes Educator Training	18.5 hrs per Educator 12 Educators trained = 222 hours	Pharmacy Staff x 2 Volunteers x 2 Sirona staff x 2 Hay 3 x1 NHS Band 6 x1 Staff#1 (Hay 8) Staff#2 (Hay 9) Staff#3 (Hay 9) Staff#4 (Hay 8)	£690 £0 £740 £398.49 £351.50 £229.58 £196.10 £196.10 £229.58
X-PERT Educator Training delivery costs			£6,000
X-PERT trainer subsistence/travel			£398
Refreshments for educator Training			£69
XPERT licence to run X-POD			£100
X-PERT resource package			£2,500
QA assessment cost			£595
Room Hire for Educator Training			£312
BP monitor/ cuff for patient measures			£96
Scales and height measure			£277
			£13,378

Project management and administration

	Activity	Time (minutes	Staff pay band [hour]	Costs
	1:1 Monthly support for Diabetes Prevention Officer	2 hours x 12	NHS Band 6 plus Hay 3 £19 p/h + £21.54 p/h = £81.08 per 1:1	£972.96
	Steering Group Meetings	10 hours	£20 x 7 attendees	£1400
				£2372.96

Evaluation

Activity				Costs
UWE	Evaluation Contract	Est. 57% of contract for set up and evaluation of 4 groups		£4,275
Diabetes Prevention Officer	Collection of initial questionnaire detail and input to database	16 hours	NHS BAND 6 £19 p/h	£304
Diabetes Prevention Officer	Collection of six month questionnaire and input to database	16 hours	NHS BAND 6 £19 p/h	£304
Diabetes Prevention Officer	Chase up of those who DNA'd six month/ unable to attend six month	7 hours	NHS BAND 6 £19 p/h	£133
Performance and Commissioning Officer	Contract for commissioning of UWE services	2 hours	Hay 6 (£17.16 p/h)	£34.32
Data Analyst	Database development, management & anonymization: UWE mtgs	2 hours	Hay 7 (£15 p/h)	£30
Data Analyst	Database preparation and amendment	4 hours	Hay 7 (£15 p/h)	£60
Data Analyst	Preparation and anonymization of data	4 hours	Hay 7 (£15 p/h)	£60
PH Lead for Obesity, Nutrition & Physical activity	Meeting with UWE to discuss collaboration	4 hours	Hay 3 (£21.54 p/h)	£86.16

PH Lead for Obesity, Nutrition & Physical activity	Research Governance Application Process	17 hours	Hay 3 (£21.54 p/h)	£366.18
				£5,653

Direct delivery costs for Phase 1: Groups A-D

	Group A	Group B	Group C	Group D	
Recruitment and enrolment	£148.7	£148.7	£148.7	£148.7	£594.8
Course Delivery Staff time	£989	£829	£1019.80	£801	£3639
Materials	£461.45	£461.45	£461.45	£461.45	£1845.80
Follow on **Staff time ()**	£24.92	£24.92	324.92	£24.92	£99.68
	£1,624	£1,464	£1,654.87	£1,436	£6,179

Notes
Recruitment and enrolment includes: participant identification, printing costs, mail out, envelope stuffing, record keeping, phone calls, further letters, paper and envelopes
Course delivery staff time: calculated hourly basis. Includes set up, liaison with surgery, running sessions, post administration, 6 week group and 3 and 6 month sessions
Materials: phlebotomy, refreshments, workbooks, leaflets, transport
Follow on time: emails, phone calls
Costs to both delivery team and GP Surgery included

Total costs

Project set up	£1,152.35
X-PERT training and materials	£13,378.00
Project management and administration	£2372.96
Evaluation	£5,653.00
Direct delivery costs for Phase 1: Groups A-D	£6,179.00
Total (Project inception to Month 6 for Phase 1: 58 clients)	**£28,735.31**

Appendix 4: Group Members and Thanks from the Project Lead

As the project lead on this programme, it has been a pleasure to meet such a wide range of people who have embraced the sessions, and enabled the courses to run so well. This project would be nothing without you all. With permissions, I would like to thank the following people who came along and shaped this evaluation project:

Group A: Wednesday 27th January to Wednesday 9th March 2016, 10am
Sandra Clark, Jackie Crammer, Patricia Horne, Roy Hubbard, Jeff Hughes, Connie Kelcey, Alan King, Geraldine Lambert, Jacqui Lewis, Philip Pegler, Nicholas Rhodes, Margaret Singleton, David Shortman, Jim Slocombe, Philip Swift.

Group B: Wednesday 27th January to Wednesday 9th March 2016, 1pm
Philip Bradley, Terry Brown, Geraldine Church, Mark Cutcliffe, Pat Monday, Christine Perry, Kath Pointon, Carol Rodwell, Michael Tavender, Kim Tooze, Christine Ward, Maggi Warner, Michael Williams, Susan Williams, Myra Wilmshurst.

Group C: Wednesday 27th January to Wednesday 9th March 2016, 5pm
Patricia Alford, Phillip Alford, Dave Alderman, Susan Evans, John Hardie, Michael Holder, Anne Hugh, Heather Hunt, Rosemary Lancaster, Peter Lee, Graham Peters, Alan Williams, Gail Wyatt, Julie Winfield.

Group D: Monday 15th February to Monday 21st March 2016, 10am
Jeff Amos, Sheila Bleaden, Ruby Bowring, Christopher Burt, Beryl Cook, Pauline Dent, Alan Ducker, Maureen Henderson, Sandra Hill, Bob Hutchinson, Susan Moreton, Diane Palmer, Rosemary Pearce, Barbara Pressey, Jackie Skinner.

Group E: Wednesday 13th April to Wednesday 18th May 2016, 10am
Michael Budd, Greg Derham, Debbie Firth, Michael Gillett, Kay Griffin, Janet Hazelby, Peter Hobbs, Barbara James, Elaine King, Robert Lapthorn, Rhian Niblett, Ann Price, Surinder Suthar, Louise Thorne, Geoffrey Witherden.

Group F: Wednesday 13th April to Wednesday 18th May 2016, 1pm
Georgina Baker, Richard Boyd, Mary Cronin, Nicola Daunton, Jill Davies, Gillian Gibbs, Steve Lewis, Rosamund Little, Elizabeth Machin, Stephen Ward, Elizabeth Welling.

Group G: Tuesday 19th April to Tuesday 24th May 2016, 10am
David Boucher, Roy Chappell, John Davis, Pauline Fletcher, John Godwin, Alan Headford, Pauline Hallett, John Hounslow, Suzanne Toghill, Linda Wood.

On a final note, thanks extended to Harvinder Bilkhu, patient representative who attended Educator training and initial sessions to advise and comment on content and delivery.

Thanks also to Barry Crammer and his wife, Jackie. Barry attended Educator training, then almost every session delivered throughout the year alongside Jackie. Barry was able to add depth to commentary on life with type 2 diabetes, and support all Educators delivering sessions. He was, and remains, a huge asset to this programme.