

A Practical Guide to Delivering Nutritional Advice to People with Diabetes

Pamela A. Dyson

Received: November 14, 2018 / Published online: January 31, 2019
© The Author(s) 2019

ABSTRACT

Dietary advice is fundamental to the management of diabetes. Although ideally such advice should be delivered by a state-registered dietitian, it is more usually delivered by other health professionals. The primary focus for those with type 1 diabetes is carbohydrate counting and insulin adjustment and for the majority of people with type 2 diabetes, weight management is key. Patient-centred care is emphasised for the delivery of dietary advice. It is widely recognised that knowledge alone is not sufficient to induce behaviour change and practical approaches to a variety of behavioural interventions are discussed.

Keywords: Diabetes; Diet; Person-centred

Abbreviations

ADA	American Diabetes Association
CBT	Cognitive behavioural therapy
DiRECT	Diabetes remission clinical trial
HbA1c	Glycated haemoglobin

Enhanced Digital Features To view enhanced digital features for this article go to <https://doi.org/10.6084/m9.figshare.7454978>.

P. A. Dyson (✉)
Oxford Centre for Diabetes, Endocrinology and Metabolism, University of Oxford, Oxford, UK
e-mail: pamela.dyson@ocdem.ox.ac.uk

MI	Motivational interviewing
PCC	Patient-centred care
SFT	Solution-focused therapy
SMART	Specific, measurable, achievable, realistic and time-based
SMBG	Self-monitoring of blood glucose
TDR	Total diet replacement

INTRODUCTION

There is a wealth of evidence demonstrating that dietary interventions are effective for the management of both type 1 and type 2 diabetes, for the prevention of type 2 diabetes, and there is now emerging evidence for the remission of type 2 diabetes [1–5]. Traditionally, it is recommended that nutritional advice is delivered by registered dietitians, and although there is evidence that dietitian-led interventions are more effective than those without input from dietitians [6], both the American Diabetes Association (ADA) and Diabetes UK recognise that other health professionals have a role in delivering dietary advice, ideally guided by a registered dietitian [1, 2]. However, access to registered dietitians is limited, and a survey in the UK in 2002 reported that the level of dietetic support for those with diabetes was dramatically lower than recommendations, and had not increased since a survey conducted 5 years previously [7].

The current recommended gold standard of care is to deliver dietary advice as part of intensive multicomponent lifestyle programmes, and this is endorsed by both international and national bodies [8–11]. However, in the UK for example, despite the fact that structured education was offered to 50% of those with type 1 diabetes and 90% of those with type 2 diabetes in 2015–2016, only 5–10% attended education programmes [12]. In many areas of the world, there are no dietitians or education programmes available, and where there are, limited uptake and restricted access to these facilities mean that people with diabetes rely on their primary healthcare provider for dietary advice. Unfortunately, primary healthcare professionals have little training in delivering dietary advice to people with diabetes. Nutrition and lifestyle education for physicians is insufficient and more than 75% report that they are inadequately trained to counsel their patients on diet and physical activity [13]. Nurses are often required to deliver dietary advice, but there is evidence that they have inadequate knowledge and skills to improve outcomes [14]. This lack of professional support for people with diabetes is illustrated by data from the Helpline at Diabetes UK, where approximately 70% of the 20,000 calls received annually are diet-related queries [15].

This article aims to offer a practical guide for health professionals who deliver dietary information to people with diabetes.

COMPONENTS OF DIETARY ADVICE

Evidence-based guidelines for dietary advice are widely available and differ slightly for type 1 and type 2 diabetes [1, 2]. The main emphasis for those with type 1 diabetes is to maintain blood glucose concentrations as close to the non-diabetic range as possible while avoiding hypoglycaemia, aiming for HbA1c of 48 mmol/mol (6.5%) or less in order to reduce the risk of long-term complications. The primary strategy for glycaemic control is widely accepted as carbohydrate counting with insulin dose adjustment on a meal-by-meal basis, and

two recent meta-analyses have confirmed the efficacy of this approach [16, 17]. It is recommended that carbohydrate counting and insulin adjustment are included in structured education programmes and referral to a local, validated programme is advocated. There is online, web-based information available for those with no access to structured education, for example from Diabetes UK and the Royal Bournemouth Hospital [18, 19], but these approaches have not been tested for efficacy and safety in randomised controlled trials.

The fundamental recommendation for the 90% of those with type 2 diabetes who are overweight or obese is weight loss. The benefits of losing at least 5% body weight have been well documented [20], with evidence that greater weight loss leads to greater benefit and even remission in 86% of those recently diagnosed who lose at least 15 kg [5]. The key question is what dietary strategy should be used to support weight loss in people with type 2 diabetes. For diabetes remission, the DiRECT trial (Diabetes Remission Clinical Trial) used a combination of total diet replacement (TDR) with a liquid formula providing 825–853 kcal/day for 12–20 weeks, followed by a structured programme of food re-introduction and weight maintenance [5]. Although this study was conducted in primary care, full training and support was supplied by four specialist research dietitians, and each primary care nurse received 8 h of training. At present, it is unlikely that this would be readily translated to general practice, but discussion is ongoing. For general weight management in those with established type 2 diabetes there is evidence that most dietary interventions are effective [20], that differences in outcomes between different strategies are small and insignificant [21–23], and that behavioural interventions increase efficacy [24, 25].

One aspect of weight management that is often overlooked is that of personal choice and despite recommendations that dietary advice should be culturally acceptable, affordable and tailored to the individual, the personal view of the health professionals commonly underpins advice. This can be illustrated by the recent controversy about low carbohydrate diets, where academics and health professionals alike

have opposing views; some are recommending healthy eating [26] and others are proposing that low carbohydrate diets should be the default strategy for those with type 2 diabetes [27]. In these debates, the views of the person with diabetes are rarely heard, despite calls for patient-centred care (PCC) [28].

DELIVERING DIETARY ADVICE

Medical care for those with diabetes traditionally mirrored the acute care model, where clinicians collect information and dispense advice based on observed clinical parameters. Research in the 1990s reported that physicians typically chose an area of concern for exploration before determining their patient's concerns, and interrupted the patient's opening statement after only 23 s [29]. Management guidelines for long-term conditions such as diabetes now emphasise the role of patient centred care [28] and empathy [30] while acknowledging that people with diabetes make daily self-management decisions that have greater impact on their health than those made by health professionals [31]. The challenge for most health professionals is using a patient-centred approach when they have little access to training in behavioural therapy or support from clinical psychologists.

PATIENT-CENTRED CARE

Patient-centred care (PCC) has been defined as encompassing the management of biophysical markers, alongside the human experience of disease [32]. Limited evidence suggests that a variety of behavioural approaches can improve interactions between health professionals and patients, and that some result in improvements in health outcomes, but many studies do not fully report specific details of successful interactions and the underpinning theories [32, 33]. PCC is rooted in a change of the health professional's mindset from an authoritarian approach to a more collaborative style and includes acquiring skills such as motivational interviewing,

empowerment-based communication, cognitive behavioural therapy and mindfulness [34].

APPLYING PCC TO WEIGHT MANAGEMENT IN DIABETES

A variety of behavioural and psychosocial strategies have been tested in studies and all appear to improve outcomes in people with diabetes when compared with no intervention [35, 36]. Some examples of useful practical strategies in practice include the 5C intervention [35] and solution focused therapy (SFT) [36]. The 5C intervention consists of five concepts: constructing a problem definition, collaborative goal-setting, collaborative problem-solving, contracting for change and continuing support. SFT is a brief, patient-led therapy focusing on solution-building rather than problem-solving and aims to increase an individual's personal control, and its efficacy for improving health-related psychosocial outcomes has been demonstrated [37]. There are a number of practical steps, outlined below, that can be useful when facilitating health behaviour change [38].

Agenda Setting

Typically, most health professionals have a strong righting reflex where they try to persuade or convince individuals to change their behaviour in order to improve their health, but without first gaining their permission. The most persuasive and influential voice in any interaction is the person with diabetes; the locus of control rests firmly with them and they are best placed to set the agenda. Some examples of useful phrases to set the agenda and elicit specific issues around weight management include:

'Are you interested in talking about weight reduction or do you have more important concerns today?'

'Today we could talk about weight reduction in terms of your diet or physical activity—what do you think?'

‘Studies show that losing weight improves all aspects of diabetes control. What do you think?’

Once the person with diabetes has identified a specific issue this can be further defined using simple techniques to assess importance and confidence [39]. In order to assess importance the following question can be asked:

‘How important do you think that weight loss is for your health? On a scale of 1 to 10, where 1 is not at all important, and 10 is very important, what number would you give yourself?’

Many people are already aware of the link between health and body weight and will allocate a high score in answer to this question. A high score denotes that weight loss is of consequence to the individual, and no further time or effort is needed to convince them. If a low score is volunteered by the person with diabetes, indicating that weight loss is not important, this can be explored by a follow-up question:

‘What would need to change in your life to make weight loss more important?’

Once importance has been established and addressed, confidence can be assessed in a similar fashion by asking:

How confident are you about actually losing weight? On a scale of 1 to 10, where 1 is not at all confident, and 10 is very confident, what number would you give yourself?’

A high score denotes confidence that the individual feels able to achieve weight loss and can begin the process of goal-setting and defining the dietary intervention that they would like to adopt. In practice, many people with type 2 diabetes recognise the importance of weight loss, but report low confidence. When an individual reports a low score, the health professional’s righting reflex comes into play and they often begin to make suggestions and provide their own solutions to the individual’s issues. This frequently creates resistance and, as a result, the person with diabetes often refuses to engage and will ignore, deny or question any

recommendations made. This can be addressed by simply noting the confidence number given by the individual and asking them for their opinion about the next step by saying:

‘You have given me (for example) the number 3 for how confident you feel. This tells me that you don’t feel confident at all about losing weight. What would need to change in your life to move the score up to a 7 or 8?’

Techniques such as cognitive behavioural therapy (CBT) and motivational interviewing (MI) are useful techniques for supporting discussion about barriers to behaviour change. CBT is a structured talking therapy designed to support problem-solving by facilitating and supporting skills to challenge negative thoughts and modify dysfunctional behaviour. It helps people understand the links between thoughts, feelings and behaviour and although there is evidence of its effectiveness for depression and anxiety, there are equivocal results for glycaemic control and quality of life [40]. MI is a style of counselling that explores and supports resolution of the ambivalence that prevents people achieving their personal health goals and operates through five guiding principles: expressing empathy through reflective listening, developing discrepancy between goals and behaviour, avoiding arguments and confrontation, adjusting to rather than opposing resistance and supporting self-efficacy. MI has been widely applied to diabetes and evidence shows that it has the potential to facilitate behaviour change [41] and that it is effective for weight loss in people with type 2 diabetes [42]. Applying these strategies supports the individual in identifying specific issues which can then be addressed through collaborative goal-setting.

Goal Setting

Goal setting techniques are effective for health behaviour change [43], and there are different techniques that can be employed including ‘SMART’ (Specific, Measurable, Achievable, Realistic and Time-based) [44] or the simpler ‘What, How and When?’ approach. Setting

specific and realistic goals is key for successful behaviour change, together with regular self-reflection and feedback.

Self-Monitoring, Self-Reflection and Feedback

Feedback is integral to health behaviour change [45], and it is generally accepted that self-monitoring is effective for improving glycaemic control and weight loss in people with type 1 diabetes. For people with type 2 diabetes not treated by insulin, self-monitoring of blood glucose (SMBG) is associated with modest but significant reductions of HbA1c of approximately 3 mmol/mol (0.3%) in studies of 6 months or less [46, 47], although these benefits are not maintained at 1 year's follow-up [46]. There is also a significant association between self-monitoring by diet or physical activity diaries or self-weighing and weight loss [48], with evidence suggesting that daily or weekly self-weighing improves outcomes [49]. There are a wide variety of strategies to support self-monitoring including paper diaries and technology-enabled self-management solutions using mobile phones, secure messaging and digital feedback from personal devices tracking physical activity, energy expenditure and food intake, and there is evidence of efficacy for these technology-enabled self-management devices [50].

CONCLUSIONS

Delivering effective dietary advice for people with diabetes goes beyond supplying information and addresses the behavioural and psychosocial determinants of health behaviour change. Adopting new skills and changing their own behaviour is challenging for many health-care professionals, and there are few education programmes available that specifically address effective consultation skills rather than increasing clinical expertise. Despite these challenges, there are practical strategies that can be incorporated into general practice and most of these strategies are not more time-consuming

than standard approaches and are more effective if used appropriately.

ACKNOWLEDGEMENTS

Funding. No funding or sponsorship was received for this study or publication of this article.

Authorship. All named authors meet the International Committee of Medical Journal Editors (ICMJE) criteria for authorship for this article, take responsibility for the integrity of the work as a whole, and have given their approval for this version to be published.

Disclosures. Pamela Dyson has no conflict of interest to declare for this manuscript, she receives no personal remuneration from any private company.

However, she is a member of:

- Diabetes UK Nutrition Sub-Committee
- Scientific Advisory Committee on Nutrition (SACN) investigating low carbohydrate diets in the management of type 2 diabetes

And has been involved with projects receiving unrestricted research grants from:

- Sugar Bureau
- PepsiCo Foundation
- Novo Nordisk
- Abbott Diabetes Care

She has also received honoraria for lectures from:

- Abbott Diabetes Care
- Lilly
- MSD
- Novo Nordisk
- Janssen
- Sanofi

Compliance with Ethics Guidelines. This article is based on previously conducted treatments and does not contain any studies with human participants or animals performed by any of the authors.

Open Access. This article is distributed under the terms of the Creative Commons

Attribution-NonCommercial 4.0 International License (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits any noncommercial use, distribution, and reproduction in any medium, provided you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license, and indicate if changes were made.

REFERENCES

- Dyson PA, Twenefour D, Breen C, et al. Diabetes UK evidence-based nutrition guidelines for the prevention and management of diabetes. *Diabet Med*. 2018;35(5):541–7.
- Evert AB, Boucher JL, Cypress M, et al. Nutrition therapy recommendations for the management of adults with diabetes. *Diabetes Care*. 2014;37(Suppl 1):S120–43.
- Franz MJ, Powers MA, Leontos C, et al. The evidence for medical nutrition therapy for type 1 and type 2 diabetes in adults. *J Am Diet Assoc*. 2010;110(12):1852–89.
- Gillett M, Royle P, Snaith A, et al. Non-pharmacological interventions to reduce the risk of diabetes in people with impaired glucose regulation: a systematic review and economic evaluation. *Health Technol Assess*. 2012;16(33):1–236.
- Lean ME, Leslie WS, Barnes AC, et al. Primary care-led weight management for remission of type 2 diabetes: (DIRECT): an open-label, cluster-randomised trial. *Lancet*. 2018;391(10120):541–51.
- Briggs Early K, Stanley K. Position of the Academy of Nutrition and Dietetics: The role of medical nutrition therapy and registered dietitian nutritionists in the prevention and treatment of prediabetes and type 2 diabetes. *J Acad Nutr Diet*. 2018;118(2):343–53.
- Winocour PH, Mearing C, Ainsworth A, Williams DR, Association of British Clinical Diabetologists. Association of British Clinical Diabetologists (ABCD): survey of specialist diabetes care services in the UK, 2000. 4. Dietetic services and nutritional issues. *Diabet Med*. 2002;19(Suppl 4):39–43.
- International Diabetes Federation. International charter of rights and responsibilities of people with diabetes. Brussels: IDF; 2013.
- American Diabetes Association. Standards of medical care in diabetes. *Diabetes Care*. 2019;42(Suppl 1):S46–60.
- National institute for Health and Care Excellence. Type 1 diabetes in adults: diagnosis and management (NG17). London: NICE; 2015.
- National institute for Health and Care Excellence. Type 2 diabetes in adults: management (NG28). London: NICE; 2015.
- National Health Service. National Diabetes Audit 2016–17. NHS Digital, 2018. https://files.digital.nhs.uk/pdf/s/k/national_diabetes_audit_2016-17_report_1__care_processes_and_treatment_targets.pdf. Accessed 18 Oct 2018.
- Wormersley K, Ripullone K. Medical schools should be prioritising nutrition and lifestyle education. *BMJ*. 2017;359:j4861.
- Xu X, Parker D, Ferguson C, Hickman L. Where is the nurse in nutritional care? *Contemp Nurse*. 2017;53(3):267–70.
- Diabetes UK; Douglas Twenefour, personal communication.
- Vaz EC, Porfirio GJM, Nunes HRC, Nunes-Nogueira VDS. Effectiveness and safety of carbohydrate counting in the management of adult patients with type 1 diabetes mellitus: a systematic review and meta-analysis. *Arch Endocrinol Metab*. 2018;62(3):337–45.
- Fu S, Li L, Deng S, Liu Z. Effectiveness of advanced carbohydrate counting in type 1 diabetes mellitus: a systematic review and meta-analysis. *Sci Rep*. 2016;6:37067.
- Diabetes UK. Carbs count e-book. <https://www.diabetes.org.uk/resources-s3/2017-11/carbs-count-2012.pdf>. Accessed 18 Oct 2018.
- Royal Bournemouth Hospital: Bertie type 1 diabetes education programme. <https://www.bertieonline.org.uk>. Accessed 18 Oct 2018.
- Franz MJ, Boucher JL, Rutten-Ramos S, VanWormer JJ. Lifestyle weight-loss intervention outcomes in overweight and obese adults with type 2 diabetes: a systematic review and meta-analysis of randomized clinical trials. *J Acad Nutr Diet*. 2015;115(9):1447–63.
- Johnston BC, Kanters S, Bandayrel K, et al. Comparison of weight loss among named diet programs in overweight and obese adults: a meta-analysis. *JAMA*. 2014;312(9):923–33.

22. Naude CE, Schoonees A, Senekal M, Young T, Garner P, Volmink J. Low carbohydrate versus isoen-energetic balanced diets for reducing weight and cardiovascular risk: a systematic review and meta-analysis. *PLoS One*. 2014;9(7):e100652.
23. Thom G, Lean M. Is there an optimal diet for weight management and metabolic health? *Gastroenterology*. 2017;152(7):1739–51.
24. Jacob A, Moullec G, Lavoie KL, et al. Impact of cognitive-behavioral interventions on weight loss and psychological outcomes: a meta-analysis. *Health Psychol*. 2018;37(5):417–32.
25. Johns DJ, Hartmann-Boyce J, Jebb SA, Aveyard P, Behavioural Weight Management Review Group. Diet or exercise interventions vs combined weight management programs: a systematic review and meta-analysis of direct comparisons. *J Acad Nutr Diet*. 2014;114(10):1557–68.
26. Mann J, McLean R, Skeaff M, Morenga LT. Low carbohydrate diets: going against the grain. *Lancet*. 2014;384(9953):1479–80.
27. Feinman RD, Pogozelski WK, Astrup A, et al. Dietary carbohydrate restriction as the first approach in diabetes management: critical review and evidence base. *Nutrition*. 2015;31:1–13.
28. Richards T, Coulter A, Wicks P. Time to deliver patient centred care. *BMJ*. 2015;350:h530.
29. Marvel MK, Epstein RM, Flowers K, Beckman HB. Soliciting the patient's agenda: have we improved? *JAMA*. 1999;281(3):283–7.
30. Eby D. Empathy in general practice: its meaning for patients and doctors. *Br J Gen Pract*. 2018;68(674):412–3.
31. Funnell MM, Anderson RM. Empowerment and self-management of diabetes. *Clin Diabetes*. 2004;22:123–7.
32. Mead N, Bower P. Patient-centredness: a conceptual framework and review of the empirical literature. *Soc Sci Med*. 2000;51(7):1087–110.
33. Griffin SJ, Kinmonth AL, Veltman MW, Gillard S, Grant J, Stewart M. Effect on health-related outcomes of interventions to alter the interaction between patients and practitioners: a systematic review of trials. *Ann Fam Med*. 2004;2(6):595–608.
34. Fisher L, Polonsky WH, Hessler D, Potter MB. A practical framework for encouraging and supporting positive behaviour change in diabetes. *Diabet Med*. 2017;34(12):1658–66.
35. Peyrot M, Rubin RR. Behavioral and psychosocial interventions in diabetes: a conceptual review. *Diabetes Care*. 2007;30(10):2433–40.
36. Harvey J. Psychosocial interventions for the diabetic patient. *Diabetes Metab Syndr Obes*. 2015;8:29–43.
37. De Jong P, Berg IK. *Interviewing for solutions*. 3rd ed. Pacific Grove: Brooks/Cole; 2007.
38. Zhang A, Franklin C, Currin-McCulloch J, Park S, Kim J. The effectiveness of strength-based, solution-focused brief therapy in medical settings: a systematic review and meta-analysis of randomized controlled trials. *J Behav Med*. 2018;41(2):139–51.
39. Mason P, Rollnick S, Butler C. *Health behaviour change: a practitioner's guide*. 3rd ed. London: Churchill Livingstone; 2018.
40. Uchendu C, Blake H. Effectiveness of cognitive-behavioural therapy on glycaemic control and psychological outcomes in adults with diabetes mellitus: a systematic review and meta-analysis of randomized controlled trials. *Diabet Med*. 2017;34(3):328–39.
41. Christie D, Channon S. The potential for motivational interviewing to improve outcomes in the management of diabetes and obesity in paediatric and adult populations: a clinical review. *Diabetes Obes Metab*. 2014;16(5):381–7.
42. Ekong G, Kavookjian J. Motivational interviewing and outcomes in adults with type 2 diabetes: a systematic review. *Patient Educ Couns*. 2016;99(6):944–52.
43. Shilts MK, Horowitz M, Townsend MS. Goal setting as a strategy for dietary and physical activity and behavior change: a review of the literature. *Am J Health Prom*. 2004;19(2):81–93.
44. Doran GT. There's a S.M.A.R.T. way to write management's goals and objectives. *Manag Rev*. 1981;70:35–6.
45. DiClemente CC, Marinilli AS, Singh M, Bellino LE. The role of feedback in the process of health behavior change. *Am J Health Behav*. 2001;25(3):217–27.
46. Machry RV, Rados DV, Gregório GR, Rodrigues TC. Self-monitoring blood glucose improves glycaemic control in type 2 diabetes without intensive treatment: a systematic review and meta-analysis. *Diabetes Res Clin Pract*. 2018;142:173–87.
47. Zhu H, Zhu Y, Leung SW. Is self-monitoring of blood glucose effective in improving glycaemic control in type 2 diabetes without insulin

-
- treatment: a meta-analysis of randomised controlled trials. *BMJ Open*. 2016;6(9):e010524.
48. Burke LE, Wang J, Sevick MA. Self-monitoring in weight loss: a systematic review of the literature. *J Am Diet Assoc*. 2011;111(1):92–102.
49. Shieh C, Knisely MR, Clark D, Carpenter JS. Self-weighing in weight management interventions: a systematic review of literature. *Obes Res Clin Pract*. 2016;10(5):493–519.
50. Greenwood DA, Gee PM, Fatkin KJ, Peeples M. A systematic review of reviews evaluating technology-enabled diabetes self-management education and support. *J Diabetes Sci Technol*. 2017;11(5):1015–27.