Making healthy choices

Expert in biomedical nutrition Professor Carla Miller develops programmes to help people adopt healthier food choices. Here, she describes her particular focus on diabetes management, and the importance of setting specific but achievable goals.

Can you outline the current diabetes situation in the US? What are the implications of this epidemic?

There were approximately 29.1 million people with diabetes and 86 million adults with prediabetes in the US in 2012. This translates into almost half of US adults either having diabetes or being at risk for developing the condition. The economic burden associated with elevated blood glucose exceeded US $1,000 for every American in 2012. People with prediabetes have an increased likelihood of developing type 2 diabetes mellitus, and those with type 2 diabetes are at greater risk of diseases associated with small blood vessels, such as neuropathy, and large blood vessels, such as cardiovascular disease. But this is not just a problem in America; the growing epidemic of diabetes is occurring across the world.

What led you to establish a research career within the areas of diabetes and nutrition?

I worked as a dietitian in medical centres for almost 10 years. During that time, I counselled patients with cardiovascular disease, many of whom also had type 2 diabetes. I became very interested in diabetes and how to help my patients make changes in their eating habits to optimise their blood glucose and cholesterol levels. I realised I needed more in-depth knowledge regarding behavioural change and returned to graduate school to obtain a PhD. In doing so, I became interested in learning how and why people engage in behavioural change, particularly as it relates to nutrition.

Can you discuss the established treatments for type 2 diabetes and their associated drawbacks?

Type 2 diabetes requires extensive self-management by individuals. Blood glucose levels are influenced by many factors such as the foods people eat, the level of physical activity achieved, medications and stress. People with type 2 diabetes report that controlling their food choices is one of the most difficult aspects of daily management. Food is present everywhere and in large quantities; making healthy food choices requires knowledge, skill and a plan of action in order to be successful.

How are you taking a different approach to the prevention or delay of type 2 diabetes, as well as its management?

We use a systematic process for the design, delivery and impact evaluation of behaviour change interventions. When interventions consist of techniques based on empirically-supported theory, that theory provides an explanation of how and why the intervention worked. Without theory to guide the process, programme developers do not know why an intervention did or did not work, or how to improve the programme. The identification of effective behaviour change techniques fosters the development of evidence-based practice in diabetes management.

What role does education play in the management of diabetes? To what extent have you investigated this aspect of nutrition intervention?

People tell us they want and need the support and accountability that behavioural interventions provide. Living with diabetes can be challenging and people value knowing that others face similar situations. The group-based interventions we offer enable participants to learn from each other and share the obstacles encountered and successes achieved.

Can you describe the insights you have gleaned to date with respect to glycaemic index (GI) and glycaemic load (GL)?

My research has demonstrated that dietary patterns improve following a behavioural intervention regarding GI and GL. Participants consumed more fruits, vegetables, dairy foods and high fibre foods, and ate fewer high fat foods and sugars, leading to an improvement in blood glucose. People need to set specific targets for change and develop detailed action plans regarding how, when and where they will substitute lower for higher GI foods. Simply stating that one is going to ‘eat more fibre’ is not specific enough. Currently, we are conducting a pilot study to determine how to set incrementally more challenging GI goals as people succeed in changing their eating habits. We need to learn more about the magnitude of incremental change that helps people succeed before a goal becomes so difficult that it is abandoned.

What key findings did you make in your recent study examining the translation of behaviour change interventions to the workplace?

My research team’s recent lifestyle intervention delivered at a university worksite proved the feasibility and efficacy of a worksite approach. Significant improvement in weight, fasting glucose, blood pressure, dietary intake and physical activity occurred among the participants randomised to the experimental group.
THE CHOICES WE make about food are closely related to our health. This is particularly true for those with diabetes, as blood glucose is tightly linked with carbohydrate consumption. Type 2 diabetes is a prime example of a disease that requires optimal self-management. Indeed, there is compelling evidence that the condition can be delayed and perhaps even prevented by lifestyle modification. Such changes are particularly important in the US, where the number of people diagnosed is growing by approximately 1 million per year.

However, insuring widespread lifestyle modifications is a complex undertaking. Today, food is available in abundance and making healthy choices takes more than just willpower: it requires knowledge, expertise and planning. Essential to this is behavioural theory.

Professor in Human Nutrition Carla Miller is using theory to understand why people make behavioural changes, and to help them achieve positive change in their diets. Based at The Ohio State University, Miller is researching the decision making process consumers apply to food choices for the development of effective behavioural change techniques.

A MAJOR HEALTHCARE BURDEN

Diabetes is one of the most prevalent conditions faced by healthcare providers. Almost half of adult Americans have diabetes or are at risk of developing the condition. Type 2 diabetes is associated with a 10 year decrease in lifespan due to the associated complications, most notably cardiovascular disease. Aside from the health impact, the economic burden totalled US $322 billion in 2012, amounting to over US $1,000 per person in medical insurance and lost productivity costs. It is therefore imperative to intervene in patients with prediabetes to prevent or delay the onset of type 2 diabetes. One way of achieving this is through diet. Furthermore, dietary changes can also help those who already have the disease to control their blood glucose and body weight, helping to prevent the onset of comorbidities including heart disease and stroke.

Miller’s laboratory conducts wide-ranging efforts to help people in this transition, and ultimately lessen the burden of this global problem. Their research follows a systematic approach based on psychological theory to identify the targets of behavioural change and translate those targets to the patient.

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TESTING MOBILE TECHNOLOGY

- Using mobile technology in the context of a diary study, the team is investigating how goal setting theory can influence the achievement of a lower GI diet.
- Tailored goal setting interventions are more effective. Mobile technology provides the perfect means of personalising goals to individual needs, but there is little research regarding the efficacy of such an approach.
- In this pilot study, Miller’s team will determine the potential of mobile technology to personalise a dietary goal for the adoption of a lower GI diet, as well as the impact of such a dietary change on body weight and blood glucose.

Miller’s overall goal is to help people change their nutrition-related behaviours,” she explains. This involves targeting determinants of behaviour – the mechanisms of change – using precise methods: “Techniques for targeting behavioural determinants are selected and applied in an intervention, and a randomised controlled trial is used to evaluate impact,” details Miller.
WHY DO PEOPLE CHANGE THEIR FOOD CHOICES?

OBJECTIVES
• To identify the predictors/determinants of nutrition-related behaviour change
• To understand the design, delivery and impact of behaviour change nutritional interventions
• To translate effective behaviour change interventions to workplaces

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FUNDING
National Institute of Diabetes and Digestive and Kidney Diseases [NIDDK], National Institutes of Health [NIH]
Food Innovation Center, The Ohio State University

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CARLA MILLER is a professor at The Ohio State University and holds an appointment in Human Nutrition and in Health Behaviour and Health Promotion. She is a Fellow in the Academy of Nutrition and Dietetics. Miller serves as Associate Director of the Interdisciplinary PhD Program in Nutrition at The Ohio State University and is a member of the Center for Clinical and Translational Science. Miller’s research focuses on the development, implementation and evaluation of behaviour change interventions, primarily for people with type 2 diabetes or prediabetes. She has extensive experience in conducting randomised controlled trials for impact evaluation.

GOAL SETTING
The challenge of a healthy lifestyle is something everyone can relate to. Knowing what is good for us is often not enough to adhere to change. Indeed, people encounter numerous challenges when trying to adopt, and particularly maintain, a healthy lifestyle. In order to understand how and why individuals change their nutritional habits, and what makes them successful, Miller applies psychological behaviour change theory. Goal setting, a widely used behavioural change tool in diabetes, has been a particular focus of their work. In 2011, in collaboration with Loyola University Maryland, the team tested a behavioural intervention incorporating specific glycaemic index [GI] goals. GI is a ranking of carbohydrate-containing food based on their effect on blood glucose levels. Low GI foods can be beneficial for type 2 diabetes patients as they are slowly absorbed, which can help to control postprandial blood glucose levels.

Despite this, limited research has been conducted to assess the effects of goals regarding the consumption of low GI foods on diabetes outcomes. Thus, the team devised a study to evaluate just that. In a three month intervention, participants saw significant decreases in weight, BMI and plasma glucose levels. These findings suggest that helping patients to set specific targets for dietary change, and assisting them to achieve those goals, could improve outcomes in the clinic.

DESIGNING INTERVENTIONS
As well as assessing what makes change successful, Miller also designs her own interventions. Diabetes requires extensive self-management; but while self-management is imperative to extending lifespan, it is also challenging. Diet is reported to be one of the most difficult behaviours to self-manage – hence, she aims to design theory-based interventions that will help make this task easier.

In her early work, Miller undertook a nutritional intervention for older adults with diabetes. This disease becomes more prevalent with age – it is around twice as common in those over 65 as in the general US population. Yet, paradoxically, intervention programmes are usually aimed at younger adults. In recognition of the lack of initiatives targeting older patients, Miller and her colleagues designed an innovative programme. The intervention involved weekly group sessions led by a dietitian, informed by social cognitive theory and learning theory, which resulted in marked improvements in diabetes management skills and blood glucose. The study revealed the importance of food labelling knowledge and the high potential benefits of nutritional education targeted at older adults with diabetes.

INTERVENING AT WORK
More recently, Miller has been implementing her interventions in the workplace, a particularly promising environment for health promotion. While there is no doubt that type 2 diabetes can be prevented or delayed by lifestyle changes, the majority with prediabetes report not receiving any advice about risk reduction from their healthcare provider.

In this context, places of work offer a valuable framework. Employees spend about half of their waking hours in the workplace, and it is an ideal way to reach a large proportion of the adult population. The worksite potential is huge; improving health outcomes for just a small section of the workforce could translate into a significant cut in healthcare costs.

Exploring this possibility, the researchers delivered a lifestyle intervention at a university worksite. Participants showed significant improvements in dietary intake, physical activity, weight and fasting glucose. Following this success, the team is working to obtain funding so that they can translate the intervention to employees with prediabetes across an entire university system. “We need to take interventions that work to the broader population of people at risk where they live and work,” Miller adds. In the longer term, the lifestyle interventions she is testing could be valuable for informing health policies at worksites.