

Research: Educational and Psychological Aspects

Making dietary changes following a diagnosis of prediabetes: a qualitative exploration of barriers and facilitators

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Abstract

Aim To explore the experiences of people recently diagnosed with prediabetes and overweight or obese in making dietary changes following a six-month primary care nurse-delivered dietary intervention pilot.

Methods Semi-structured interviews were conducted with 20 participants, purposefully selected to ensure a mix of ethnicity, gender and glycaemic outcome. Thematic analysis of interview data was undertaken.

Results Participants described feeling shocked when they received the diagnosis of prediabetes. Three core themes, each containing subthemes, emerged: (i) supportive factors - determination not to develop diabetes, clear information and manageable strategies, and supportive relationships; (ii) barriers - lack of family support, financial constraints, social expectations around food, and chronic health issues; and (iii) overcoming challenges - growing and sharing food, using frozen vegetables and planning. Challenges related to cultural expectations around providing and partaking of food were more evident for indigenous Māori participants.

Conclusions A diagnosis of prediabetes provides a window of opportunity for healthcare professionals to work with those diagnosed and their families to make healthful dietary changes. Dietary guidance is likely to be most effective when individuals' life circumstances are taken into account. Clear information and supportive relationships to facilitate lifestyle change are extremely important.

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Introduction

Prediabetes increases the risk of developing Type 2 diabetes [1]. Although this risk can be reduced through lifestyle changes [2–4], inadequate knowledge and support appear to negatively influence the motivation and ability of those with prediabetes to effectively adopt lifestyle changes [5]. An important aspect of delivering effective dietary advice is understanding the issues encountered by people when trying to adopt new dietary behaviours. However, research on factors affecting the ability to adopt protective dietary behaviours following lifestyle advice to prevent disease progression among those with prediabetes is limited, and a gap exists in understanding the barriers to making positive dietary changes among this group [5,6].

This paper reports research in New Zealand that examined making dietary changes among people with recently diagnosed prediabetes who had participated in a six-month primary care-based dietary intervention pilot study, the Prediabetes Intervention Package (PIP) [7]. In brief, the purpose of the intervention was to provide participants and their whānau (family group) with an understanding of the principles of healthy eating to empower them to make healthy dietary choices. The intervention was delivered by primary care nurses who were trained to deliver the intervention and they provided consistent individualized evidence-based dietary messages at four time-points over a six-month period. Brief dietary assessment [8], goal-setting and review, and an opportunity to attend community group education were core components of the intervention (Table 1). This multilevel primary care nurse-led prediabetes intervention was compared with current practice in a six-

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What's new?

- Well presented, clear dietary information and individualised manageable strategies within the context of supportive health professional and family relationships facilitate healthful dietary change in those with prediabetes.
- Conversely, lack of family support, financial constraints, social expectations around food, and chronic health issues present barriers to dietary change.
- Adoption of dietary recommendations for prediabetes is more likely to occur when guidance is tailored to individuals' life circumstances, and advice provided around the time of diagnosis of prediabetes when the motivation to make changes appears high may be an ideal time.

month pragmatic non-randomized quantitative pilot study [ACTRN12615000806561] with a qualitative arm [7]. After adjustment, those in the intervention group lost an average of 1.3 kg more than the control group ($p < 0.001$). Mean HbA_{1c}, BMI and waist circumference decreased in the intervention group but increased in the control group, although differences were not statistically significant. This qualitative study aimed to identify facilitators and barriers that influenced the ability to make dietary improvements through interviews with a subset of participants with recently diagnosed prediabetes who had received the six-month dietary intervention.

Participants and Methods

Setting and research team

The study was based in Hawke's Bay, a North Island east coast provincial region of New Zealand with two main

Table 1 The six components of the multilevel prediabetes intervention package (PIP) [7]

1. Health professional (primary care nurse and community nurse) training and dietitian support.
2. Individualized participant dietary assessment, goal-setting and dietary advice by primary care nurse at an initial 30-min appointment, followed by 15-min appointments at 2–3 weeks, 3 months and 6 months for reassessment, support and advice.
3. Key messages and consistent individualized opportunistic reminders based on participants' three dietary goals.
4. Nutritionally supportive primary care environment where pamphlets, magazines and posters in waiting rooms provided appropriate and consistent dietary messages.
5. Referral to a community-based group nutrition education course consisting of six-weekly sessions of 1–1.5 h each.
6. Written resources for participants, the key resource being the Diabetes New Zealand booklet, *Diabetes and healthy food choices*.

urban areas, Napier City (population: 57 240) and Hastings District (population: 73 245) [9]. The region's population is predominantly New Zealand European, with about one quarter indigenous Māori, and smaller proportions identifying as Pacific (4.4%) and Asian (3.6%) [9].

Two authors were not directly involved in delivering the intervention. SA, an independent qualitative health researcher with research experience in multi-ethnic communities, led this qualitative study, with input from LCW. KJC led the overall intervention study. Cultural advice was provided by a local Māori general practitioner.

Study design and ethics

Qualitative research methods were used as they are best suited to exploring people's perceptions and experiences from their own perspectives [10]. Individual, face-to-face, semi-structured interviews were conducted with a subsample of the 67 intervention participants who had completed the six-month PIP intervention. This research was conducted in accordance with the Declaration of Helsinki. The study was approved by the Northern A Health and Disability Ethics Committee (14/NTA/114/AM01).

Participants

PIP participants were non-pregnant adults aged ≤ 70 years with newly diagnosed prediabetes (defined as HbA_{1c} 41–49 mmol/mol (5.9–6.6%) in New Zealand) [11], BMI ≥ 25 kg/m², and not prescribed metformin. For this qualitative study, 20 participants from the intervention group were purposefully selected [12] to ensure diversity of demographic factors (gender and ethnicity) and post-intervention glycaemic states. Twenty-four participants were initially approached by their practice nurse to gauge their interest in being interviewed: four declined (two were too busy with other health issues and the other two gave no reason). Those, who agreed to participate, were contacted by the independent research interviewer (SA), who explained the study, sent them information, and made contact to arrange an interview.

Data collection and analysis

All interviews were conducted during August–December 2015 at a location of the participant's choosing. Informed written consent was obtained from each participant and all interviews were digitally audio-recorded. All participants were invited to include a family member or support person, but none did. Close attention was paid to cultural etiquette when interviewing Māori and Pacific people. The interview questions (Table 2) invited each participant to describe their reaction to the prediabetes diagnosis, their experience of changing dietary habits, including factors that supported or

Table 2 Interview questions

1	How did you feel when you were informed you had prediabetes?
2	What helped you make dietary changes?
3	What difficulties or barriers did you face when trying to make dietary changes?
4	Did you manage to overcome these difficulties or barriers? If so, how?
5	What would have made it easier to have maintained your dietary changes?
6	Do you have any other comments?

hindered their efforts, and their strategies to facilitate changes. The interview time was 45–60 min.

The dataset comprised 20 interview recordings, transcribed by an external transcriber and checked for accuracy by SA. Each author undertook multiple close readings of the transcripts. Transcripts were analysed manually using thematic analysis guided by Thomas's general inductive approach [13]. A draft coding schema was developed by SA by identifying patterns and themes in the text and segmenting data into preliminary categories around the research questions, then amalgamating similar categories. Data coding and initial theme development were reviewed by LCW and KJC, and were discussed together over the course of several meetings during data collection. A joint iterative process involving all authors determined the final key themes and subthemes [10]. Data saturation was reached with 20 interviews [14].

Results

The 20 participants comprised nine Māori, nine New Zealand European and two Pacific people, with equal numbers (n = 10) of women and men. They were aged 43–69 years, and reflected the three glycaemic states at six months: regressed to normoglycaemia (n = 4), experienced persistent prediabetes (n = 14) or developed diabetes (n = 2). All but one of those with persistent prediabetes had seen some improvement in HbA_{1c} and/or weight loss.

Three core themes, each containing subthemes, were generated: (i) factors that supported making dietary changes, (ii) factors that acted as barriers to making dietary changes, and (iii) overcoming challenges.

Factors supporting dietary changes

All participants described making some form of dietary change, which included cutting back on unhealthy foods (e.g. fatty foods, sugar, sweet drinks and alcohol), reducing portion sizes and introducing healthy foods (e.g. fruit, vegetables and grains). Three subthemes encompassed factors described as impacting on participants' ability to make dietary changes: a strong determination not to develop

diabetes, access to clear information and manageable strategies, and supportive relationships.

A strong determination not to develop diabetes

The majority (n = 15) of the participants described feeling 'shocked' or 'concerned' when they discovered they had prediabetes and considered the diagnosis a strong motivation to make dietary improvements. Many had friends or relatives who had diabetes and they were insistent that they did not want to "end up like them", with multiple health problems.

'To be told that you are prediabetic. . . it just switched on the light for me! I thought - because I've seen the dramas my husband's gone through - well I'm not going to go down that road!' (Pt. 10, Māori woman)

Participants were clearly aware of the increased risk of progression to Type 2 diabetes if lifestyle changes were not made. Three people were driven to make these changes by a desire to be alive and healthy for their children and grandchildren. One man, reflecting on the early death of men in his grandfather's generation, said:

'I've seen all my kids grow up. Now I want to be involved with their kids and be a grandfather that I never had. And the only way you're going to do that is by being healthy. . . Without this [prediabetes diagnosis] I never would have known and, I don't know, maybe I might have got diabetes. But I'm not there and I'm not going to go there as far as I'm concerned. So that's helping me.' (Pt. 9, Māori man)

The diagnosis of prediabetes led many to reflect on the importance of self-responsibility. While they found the information and guidance they received essential for making appropriate dietary changes, six participants mentioned that this was of little use if they did not apply self-discipline by choosing healthy foods, forgoing unhealthy foods and reducing food quantities:

'The thing is you can have all the sessions and have all the education but if you don't do anything yourself, nothing's going to happen, right? . . . So I mean it's really up to the person, individuals.' (Pt. 20, Māori man)

Overall, this determination to be well and to not progress to diabetes was a deeply personal motivator, driven by a desire to be well for its own sake and for the sake of loved ones.

Access to clear information and manageable strategies

The participants described their limited dietary knowledge and their confusion from mixed dietary messages pre-intervention. They reported feeling empowered and motivated by the information and strategies gained from their primary care nurses and the community education groups. Individualized, clear achievable goals facilitated the initiation and continuation of dietary behavioural changes.

‘It wasn’t stop this, stop that. It was cut down on this, cut down, little steps. . .The favourite saying is “little steps”. And that’s probably one of the most helpful sayings I’ve ever heard. . .Not trying to do it in a week or two weeks, or two months or three months. It’s over a period of time, you know?’ (Pt. 9, Māori man)

A particularly empowering achievement was learning to read food labels:

‘Yeah, the label reading, that was excellent, that was really excellent. . .I must admit that has changed my thoughts when I do go shopping. I think oh I’ll just have a look at what the fat level is, or sugar, you know.’ (Pt. 8, Pacific woman)

Many participants commented that they were previously unaware of the extent of hidden sugars, salt and fat in commonly consumed processed foods.

Supportive relationships

The importance of strong supportive relationships when attempting and maintaining healthy changes in eating behaviours was clearly evident. Participants drew on the support of others across the spectrum: health professionals, fellow participants with prediabetes, family and friends. Regular contact and a good relationship with a trusted health professional was considered especially helpful. Many of the participants were deeply grateful to their practice nurses and community education facilitators, and felt the quality of these relationships was paramount:

‘It’s the way she encouraged me, how she uplifted me. I’m so grateful. . .So I think having the right people at the forefront there, just to open you up, you know, and acknowledging where I am at.’ (Pt. 8, Pacific woman)

Feeling accountable to someone else motivated some to ‘keep on track’. This feeling appeared to reflect the quality of the relationship and the value placed on that person’s opinion:

‘It was knowing that I was going to be checked up on [laughter]. . .If you’re accountable to someone you don’t want to upset them, you know.’ (Pt. 13, Māori man)

Those who attended the community education sessions commented that they drew strength and inspiration from others with prediabetes. At a day-to-day level, friends and family were considered invaluable, particularly those in the household who understood the participant’s need to make dietary changes and encouraged them to do so:

‘My family, they all know so they’re all very helpful. You know, they’ll say how are you going with your diabetes and so forth. . .They check to see how my diet is. My wife is very good. She’ll make sure that I have the good stuff, you know.’ (Pt. 12, New Zealand European man)

While it took personal commitment and effort to make the necessary dietary changes, this effort was not achieved in isolation but within the context of supportive relationships, clear information, and manageable strategies.

Factors perceived as barriers to making dietary changes

Participants described a range of barriers to making dietary changes. Perceived barriers were grouped into four sub-themes: (i) lack of household and family/whānau support, (ii) financial constraints, (iii) social expectations and pressures around food, and (iv) other chronic health issues.

Lack of household and family/whānau support

Lack of support from family and friends appeared to significantly undermine participants’ confidence and determination to improve their diet. Almost half (n = 8), representing all glycaemic outcomes, reported feeling challenged in this respect. Three people who lived alone or as single parents felt the lack of adult support was detrimental to their resolve to make important lifestyle changes. The others felt close adults in their daily lives were almost obstructive to their dietary efforts. Two women reported having to continue to cook unhealthy food for family members because they did not want to change their diets, and others reported finding it difficult when household members continued to eat unhealthy foods in their presence.

‘You have stuff out to cook tea but you decide, no, you’ll go and get takeaways because there’s somebody else sitting there with takeaways.’ (Pt. 5, New Zealand European woman)

Although most of these participants had control over the household food purchasing and cooking, they found the behaviour of others undermined their ability to maintain healthy eating habits.

Financial constraints

A limited food budget was a significant challenge to making dietary changes for six participants. They complained that basic healthy foods were expensive while unhealthy food was cheap, thus making it difficult to make healthy choices. One single father who struggled financially, but nevertheless became normoglycaemic, questioned why support to improve access to healthy foods was not readily available:

‘Food is about the first thing that suffers. You start cutting back. You don’t want to. But, you know, all the bad food’s cheap, and all the good food’s expensive. They give subsidies for other things so why don’t they give subsidies for food?’ (Pt. 13, Māori man)

Another participant, who progressed to diabetes, had been made redundant and struggled financially. He stressed that this was his biggest barrier, and felt it was important that

health professionals realize these limitations when giving dietary advice to people on very low incomes.

Social expectations and pressures around food

Another challenge was the social expectation and pressure around providing and being offered food. Five participants, all but one of whom identified as Māori, reported this as a challenge. The cultural expectations around quantities of food and accepting food which was offered appeared very difficult to work with. A Māori woman (Pt. 15) described food as ‘a blessing and not a blessing’ for Māori and Pacific people, for whom food is central to meaningful social engagement and a source of cultural pride, and refusing food which is offered is considered offensive. One Māori man described this dilemma as follows:

‘She comes over and she brings cakes and stuff over and I’m going “No, no, no take...” But, see, it’s hard to say no because that’s like, mmm...’ (Pt. 13, Māori man)

Having visitors or entertaining others was also identified as particularly difficult, especially when on a limited budget and when guests had different dietary habits. When guests were numerous or stayed for long periods, meals that constituted unhealthy old favourites but which were easy and relatively inexpensive to prepare, were consumed.

Other chronic health issues

A further challenge was managing other chronic health conditions alongside prediabetes. Four participants described the impact that clinical depression had on their motivation to make dietary changes:

‘I’ve had mental health issues so I haven’t had a clear head over the last six months. So I’ve sort of let things slip.’ (Pt. 11, Pacific man)

Both the symptoms of depression and the side effects of prescribed medication were described as negatively impacting on the ability to maintain healthy eating. Another participant understood that dietary management of irritable bowel syndrome appeared to require following a diet that differed to that recommended for prediabetes.

Overcoming challenges

Despite the challenges already reported, and in some cases feeling overwhelmed by these difficulties, many of the participants (n = 12) described strategies they had developed to overcome them. Growing fruit and vegetables and sharing healthy food with family and neighbours were described as strategies for managing financial constraints. One woman took pride in her ability to manage on a very limited weekly food budget:

‘If I buy some fruit and veges I share it. And people that I know, if they’ve got leftovers, I’ll say “Yeah I’ll have it”.’ (Pt. 8, Pacific woman)

Using frozen vegetables when fresh ones were expensive or freezing seasonal foods for later use were commonly described as strategies. Prior to the intervention, a few people had not realized that frozen vegetables were a healthy option, and were quick to use them once this was clarified. Use of a Nutribullet to make vegetable smoothies was popular. Six participants used this device to ensure they consumed foods they might otherwise have found difficult to eat, such as vegetables. A woman who cared for preschool children in her home talked about the importance of taking time to plan her lunches carefully so she would not snack. She strongly recommended ‘just planning and being aware of what you have to do’ (Pt. 14, New Zealand European woman).

In describing the strategies used to improve their diet, participants exhibited a strong sense of empowerment from acquiring new knowledge and their investment in halting the progression of prediabetes.

Discussion

There is limited literature describing the experiences of people with recently diagnosed prediabetes, particularly around them making dietary changes [5,6,15]. This qualitative study aimed to contribute to knowledge in the field by exploring the barriers and facilitators to making dietary improvements following participation in a structured intervention offering goal-setting and dietary advice.

The current study found that amongst those with recently diagnosed prediabetes, a mixture of personal, interpersonal and environmental factors were described as ‘influential’ on the ability to make dietary changes. Supportive factors consisted of a strong determination not to develop diabetes, access to clear information and manageable strategies, and supportive relationships (both professional and personal). Factors that challenged participants’ ability or resolve to make changes were lack of whanau/family support, financial constraints, social expectations and pressures around food, and co-existing chronic health issues, in particular, mental health problems. Participants also described a range of strategies they used to overcome challenges, reinforcing the importance of their personal resolve and determination to not develop diabetes and to be well for their children and grandchildren.

Several of the barriers and facilitators to making dietary changes found in this study have been reported in studies with people diagnosed with Type 2 diabetes, including the degree of family support [16], financial constraints [17], social expectations and pressures around food [16], and managing co-morbid conditions [18]. An important difference between studies of people diagnosed with Type 2 diabetes and people in the current study is that the focus of participants in the former is on managing a diagnosed condition while in the latter the focus is preventing the development of a condition and this is a strong motivator.

A diagnosis of prediabetes can be confronting, challenging and unexpected [6]. In a UK study, people with prediabetes described feeling very uncertain and vulnerable at diagnosis, and having a strong need for information and support [19]. Participants in the current study also appeared to be vulnerable at diagnosis, expressing a sense of shock but at the same time a determination to reverse their risk. The point of diagnosis represents a window of time and opportunity, ‘a teachable moment’ [20] when people may be more open to making changes and developing or strengthening relationships with a trusted health professional who can advise and support them [21].

The study highlights the importance of supportive relationships at all levels. Their presence enhanced the person’s ability to make dietary changes while their absence was perceived as a major barrier. Although self-discipline was considered important, participants were aware that their ability to make recommended dietary choices was influenced by the presence or absence of supportive interpersonal relationships. The crucial role of family support for sustained dietary improvements was evident, as was also found in an Australian study with Aboriginal people with diabetes [22]. The strong influence of whānau/family and household members suggests that there could be important health benefits in engaging them in the education sessions and professional support provided to those with newly diagnosed prediabetes. The dietary information may also be pertinent for the family member (s) given recent studies which found concordance of abnormal glycaemia in couples where one spouse has diabetes [23,24]. In the current study, and in a UK study in which participants with prediabetes were asked how their prediabetes should be managed [25], good information and support from a trusted health professional were highly valued. This is consistent with the preferences of people with diabetes, who consider doctors, nurses and dietitians to be the most preferred source of support for diabetes management, and diet and weight loss the most important components of their diabetes management [26].

Participants’ food choices were also influenced by external factors such as budgetary constraints, the price of food, and social pressures around food. While the PIP intervention’s individualized goal-setting enabled the nurse and person with prediabetes to work, often successfully, with these factors [7], it was clear that they remained a real challenge where there was severe financial hardship. Although many participants developed strategies to work effectively with these limitations, there is also a need for advocacy to ensure wholesome foods, such as fruit and vegetables, are more financially accessible to those on limited budgets [27].

Social pressures around food affected all participant groups; however, managing the cultural sensitivities around food was particularly challenging for Māori participants as offering and partaking of food is central to manaakitanga

(hospitality), a practice integral to Māori culture. There is a strong cultural obligation for hosts to provide large quantities of food and for guests to consume as much as possible [28]. Similar cultural pressures around food are known to be present in Pacific culture [29]; however, they were not described by the two Pacific participants, neither of whom were closely connected to their wider Pacific families.

Factors that supported, acted as barriers, and helped overcome challenges were interrelated and multifaceted. Making dietary changes requires more than simply acquiring knowledge and deciding to act upon it. It also requires managing the myriad influences of complex lives, such as family and social pressures to do with food [30], in particular for those from marginalized populations [15]. While addressing social pressures is challenging, participants’ intentions of wanting to stay well for children and grandchildren were strong, and may help to lessen the social pressures around food. Starting conversations about how these two important areas can be managed would be a positive start.

A limitation of the study was that participants were approached in the first instance by the primary care nurse who had delivered the dietary intervention. This may have excluded those who denied their prediabetes diagnosis [6] and/or particularly struggled with their application of the intervention. The study’s findings may not apply to those who did not complete the six-month intervention, or to other cultural groups. Because we specifically wanted to explore the types of challenges encountered during the intervention and how these were approached, we only recruited those who had completed the intervention. While there were clear cultural distinctions around the giving and partaking of food, other differences between groups were not identified. This may be because of the relatively small sample size for some groups.

In conclusion, participants described a mix of personal, interpersonal and environmental influences on their food choices and dietary patterns. Good information coupled with trusting, supportive relationships at both personal and professional levels, along with a strong desire not to progress to diabetes, were key factors in empowering participants and facilitating necessary lifestyle changes. The cultural value of food and the social expectations around it, particularly among Māori participants, were also influential. Understanding the factors that can influence change is vital for health professionals working to effect positive change in dietary behaviour among those with prediabetes in order to prevent progression to diabetes.

The implications for practice are that dietary advice and goal-setting strategies are likely to be most effective when tailored to take account of the individual’s life circumstances. Dietary advice around the time of diagnosis when the motivation to make changes appears high may be an ideal time. However, it is unclear how long this potential window of opportunity to make changes may remain open, and this is an area for further exploration.

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Competing interests

Nothing to declare.

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