

A global survey of eating preferences, dietary habits and food beliefs

Kavita Kapur, Trisha Dunning

The pursuit of 'good' food and the desire to secure an abundant food supply significantly influenced the development of human civilisation, which in turn affected dietary preferences and eating behaviours. The authors of this article report the results of a questionnaire survey undertaken on behalf of the International Diabetes Federation Consultative Section on Diabetes Education (IDF DECS) to determine the food preferences and dietary habits of people with diabetes across the globe in order to translate this information into training programmes for healthcare professionals involved in the care of people with diabetes.

The development of eating preferences and behaviours is a complex multifactorial process (see *Box 1*). The food–medicine interface, especially in Asian medical systems such as Chinese medicine and Ayurveda, also influences food habits (World Health Organisation, 2003). As a consequence, many theories have been developed to explain eating preferences (Furst et al, 1996; Glanz et al, 1998; Levine et al, 2003).

Maslow's Hierarchy of Needs theory depicts a pyramid with five levels of needs ranging from physiological need at the base of the pyramid progressing through safety needs, love/belonging needs and esteem needs to the need

for self-actualisation at the highest level (Maslow, 1943). Lowenberg adapted Maslow's theory to incorporate the different stages in the development of food habits (1970). The lowest level of the hierarchy applies to food eaten to survive, the next level to food eaten for social security, progressing to eating to belong, then eating according to one's social status, and finally eating for self-actualisation. Lowenberg's adaptation of Maslow's theory might partly explain the differences in global eating preferences: people in countries with a limited food supply are likely to consume food to survive, while those in countries with an abundance of varied food are more likely to consume foods to satisfy higher personal needs.

Article points

1. Developing eating preferences and behaviours is a complex multifactorial process.
2. The researchers undertook an exploratory study to determine global dietary habits on behalf of IDF DECS.
3. Eating preferences differ between developed and developing countries.

Key words

- Food preferences
- Unhealthy foods
- Developing countries

Kavita Kapur is a Dietitian/Diabetes Educator at Steno Diabetes Centre, Denmark. Trisha Dunning is Inaugural Chair in Nursing at Deakin University and Barwon Health, Geelong, Australia.

In order to motivate people to make healthy food choices, it is important for health professionals to understand the factors that influence food preferences, habits, and beliefs. Many health professionals have difficulty motivating people from different cultural backgrounds to change their eating habits and sometimes regard culture as a barrier to effective care (Farooqi et al, 2000; Galasso et al, 2005).

The IDF DECS developed a multidisciplinary core curriculum and supporting teaching modules to educate health professionals to deliver diabetes education, including nutrition advice (IDF, 2006). In order to ensure the nutrition module was culturally relevant and appropriate, the authors undertook an exploratory study to determine global dietary habits on behalf of IDF DECS.

Aims of the study

The aims of the study were as follows.

- 1) To explore global eating trends and dietary habits.
- 2) To identify similarities and differences among countries and regions.
- 3) To include the information in the IDF DECS nutrition module to suggest ways health professionals could advise people with diabetes about appropriate nutrition.

Materials and methods

A one-shot cross-sectional survey was used to collect the data using anonymous questionnaires in 2005. Questionnaires were emailed to a purposive sample of 55 health professionals (doctors, nurses and dietitians) providing diabetes care across the seven IDF regions. The sample comprised 35 individual health professionals and 20 health professionals working for various diabetes associations. There are some limitations to this method as purposive samples may not be representative of the general sampling population and so the range and source of the responses may not reflect those of all health professionals or people with diabetes in that area.

Sampling procedure

The IDF member associations were asked to forward the questionnaire to relevant health

professionals in their respective regions. IDF DECS members were also asked to provide the names and contact details of health professionals in their regions who were likely to provide relevant information (n=55). One reminder email was sent to all potential participants three weeks after the questionnaire was first distributed to increase the response rate.

Questionnaire

The questionnaire consisted of 12 questions and asked about cultural influences on eating habits; staple foods; common carbohydrate, sugar, and fat foods; regional macronutrient recommendations; unhealthy eating habits; food belief; foods commonly used as medicine; and festivals and rituals (see *Box 2*).

The questionnaire was piloted by four health professionals in India and three IDF DECS members to ensure the content was relevant to the study aims, the language was appropriate and to determine whether the proposed distribution method was feasible before the questionnaire was distributed; however, it was not formally validated. Return of the questionnaire was taken as consent to participate and there was no direct working relationship between the authors and any of the participants who took part in the study.

Data analysis

The data were analysed using descriptive statistics and content analysis using the framework method. The framework method consists of a five-step process that involves a number of researchers becoming familiar with the data by reading it several times, establishing a thematic framework, indexing and charting emerging themes, and mapping and interpreting the findings (Ritchie and Spencer, 1994). Key words were identified in each question and the responses to each question were examined to identify the frequency with which the key word appeared. To understand the basis of any differences in food preferences and determine whether the preferences reflected food availability and economic factors, responses were divided into two groups defined according to the gross domestic product (GDP) at purchasing power parity (PPP) per capita. Developed countries were defined as having a GDP PPP per capita

Box 1. Factors influencing the development of eating preferences and food behaviours.

- personal likes and dislikes
- flavours
- palatability
- odours
- appearance of food
- customs
- religion
- Governmental policies
- food availability
- price
- economic issues
- family
- education
- time
- convenience of buying and preparing food
- storage facilities

Murcott, 1982; Rozin, 1990; Stafleu et al, 1995; Glanz et al, 1998; French et al, 2001; French, 2003; Levine et al, 2003; Hawkes, 2006; Jabs and Devine, 2006.

more than \$20 000 and developing countries as having a GDP PPP per capita less than \$20 000 (International Monetary Fund, 2006).

Results

Response rate

Forty-four health professionals from 36 countries responded giving a response rate of 81%. Some large countries with diverse ethnic backgrounds provided two or more responses, which were all included. Three respondents were excluded. One returned but did not complete the questionnaire, a second respondent from the South and Central America region (SACA) provided information for 16 SACA countries in one questionnaire, and the third provided information for all the Caribbean island countries in a single response. These responses were difficult to interpret and were excluded. Thus, 41 questionnaires from 34 countries were analysed.

Food preferences

The common carbohydrate, fat and sugar sources for developed and developing countries can be seen in *Table 1*.

Unhealthy foods

Unhealthy food was defined as being rich in fat, sugar or salt. The most common unhealthy foods are shown in *Figures 1a* and *1b*. Overall, foods rich in fats, oils and sugar were the most commonly consumed unhealthy foods. Developed countries were more likely to consume snacks frequently, eat large portion sizes and high-calorie foods, whereas developing countries reported a low intake of fruits and vegetables and a high intake of starchy foods. Portion sizes and frequency were assessed by health professional's judgement.

Common dietary beliefs

Thirty-nine health professionals provided information about common dietary beliefs of their patients. The responses were varied and contradictory suggesting food beliefs are a complex issue. The most commonly occurring belief was that fruit intake should be restricted. Other common beliefs were to restrict rice, starchy vegetables and carbohydrate-rich foods. It should be noted that the common food beliefs reported

in this study are those health professionals encounter in their day-to-day contact with people with diabetes and may not represent the actual beliefs of people with diabetes in the area.

There was a general trend to recommend restricting sugar intake, especially in developed countries whereas health professionals in developing countries suggested that honey or molasses should be substituted for white sugar (see *Figure 2*). Likewise, opinions differed about artificial sweeteners. Some respondents suggested that 'eating artificial sweeteners is fine,' while others advised restricting them.

Food as medicine

Six respondents from developed countries and 26 from developing countries responded to the

Box 2. The questionnaire sent to 55 health professionals to determine the dietary beliefs and eating preferences of people with diabetes in their region.

- What are the cultural influences and eating styles of the general population in your area (also take into consideration ethnic minority groups in your regions?) For example the different eating styles could be omnivorous or vegetarian eating style, or continental, American style.
- What are the indigenous staple foods of your region? For example, in India rice, whole wheat, 'Ragi', 'Bajra', 'Jowar', 'Millets' are some of the staples used in the different regions of the country.
- What is a basic meal pattern of the general population in your region? For example, most people eat three meals a day in India.
- List the common carbohydrate foods available in your region. For example, rice, wheat flour, potatoes and bread are some of the common carbohydrates easily available in India.
- What is the proportion of the different macronutrients advised to the patients in your region? For example, in India it is: carbohydrates 55–65%, protein 20%, fat 30%.
- If the sugar intake is high in your region what are the major sources?
- If the fat intake is high in your region what are the major sources?
- What do you think are the major issues regarding the eating pattern of the population in your region? What are healthy and unhealthy food habits? For example, in India, a large majority of people are vegetarian but the food commonly eaten is rich in sugars and fat.
- What are common dietary beliefs and myths in your region? For example, in UK it is believed that people with diabetes 'should not eat bananas'.
- What are the local foods that are taken as medication and what is the appropriate advice given regarding that? For example it is believed that Bitter gourd (a vegetable) and Jamun (a fruit) have properties to help reduce blood sugars. The advice normally given to the patient is they may eat the same but not to stop the medical treatment.
- What are the diet related issues you have to deal with during cultural festivals within different religious groups, such as fasting?
- Anything else specific about diet you would like us to know?

question about food eaten as medicine. Eighteen named bitter gourd (*Momordica charantia*) as a common food eaten as medicine in their area. Other foods eaten as medicine reported by developing countries were: Fenugreek (*Trigonella foenum-graecum*), Neem (*Azadirachta indica*), blackberry, traditional herbs and pumpkin.

Table 1. Major sources of carbohydrate, fat and sugar in developed and developing countries.

	Carbohydrate	Fat	Sugar
Developed countries	Rice, starchy vegetables, fruits, processed foods	Vegetable oil, meat, dairy, fried food	Soft drinks, bakery goods, chocolate, sweets
Developing countries	Rice, starchy vegetables, corn, coarse cereals, wheat	Vegetable oil, animal fat	Sugary beverages, traditional sweets

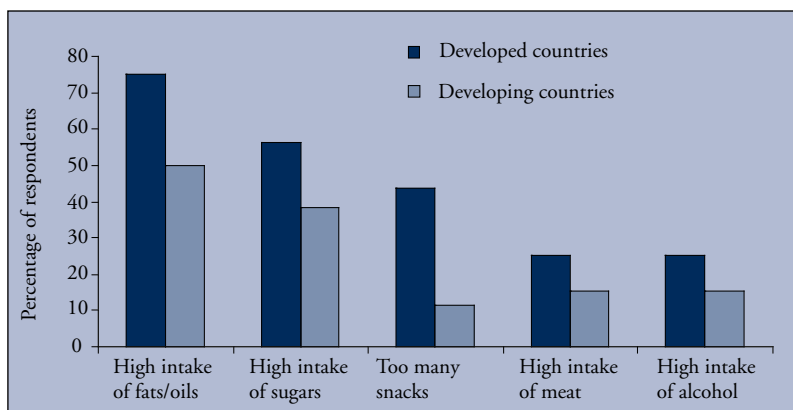


Figure 1a. Comparison of unhealthy food habits between developed and developing countries.

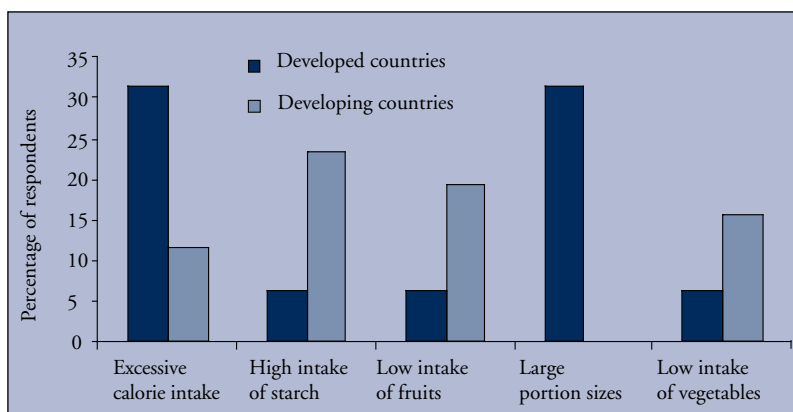


Figure 1b. Comparison of unhealthy food habits between developed and developing countries.

Discussion

Some findings, such as health professionals' perceptions about high intake of sugar and fat, were expected. Others, such as the low intake of fruits and vegetables in developing countries, were unexpected and could reflect the high cost of these foods in these countries, which supports the contention that food choices and eating preferences are partly influenced by the economic resources of individuals and countries.

Although cultural factors play an important role in food choice, it appears that these factors are increasingly being overshadowed by globalisation, increasing urbanisation, agriculture and economics that improve food availability and influence choice – especially in developed countries (Shepherd, 1999; Drewnoski and Darmon, 2005; Drewnowski, 2007).

Soft drinks and beverages were major sources of sugar in both developed and developing countries. High sugar consumption has negative health effects such as increased prevalence of dental caries and high rates of periodontal disease in people with diabetes and hyperglycemia (Ismail et al, 1997; Mealey, 2006).

All respondents agreed that a high intake of sugar- and fat-rich foods was unhealthy. Unhealthy eating habits, especially high sugar and high fat diets, combined with increased periods of inactivity, are major contributors to the increasing prevalence of non-communicable diseases – especially obesity and diabetes (Popkin, 2006; Bray, 2004; National Institutes of Health, 2004).

Traditional medical systems such as Ayurveda and Chinese medicine recommend medicinal foods as a diabetes management strategy and are widely practised in developing countries. Other researchers have also reported Ayurvedic medicines being used to reduce blood glucose, including medicinal foods (Subbulakshmi and Naik, 2001).

The increased popularity of Chinese medicine and Ayurveda outside of Asia has triggered numerous studies to determine the hypoglycaemic effects of these medicines and foods on type 2 diabetes (Leatherdale et al, 1981; Ahmad et al, 1999; Krawinkel and Keding, 2006). Some foods have been shown to have hypoglycaemic properties, but more long-term studies are needed (Yeh et al, 2003; Kuriyan et al, 2007).

Cultural differences significantly affect eating habits among people from different regions in the study. Freimer et al (1983) suggested that, in order to improve concordance, it is important to consider food beliefs and practices before intervening: this suggestion has been incorporated into the IDF DECS curriculum (IDF, 2006).

Study limitations

Although responses were obtained from many parts of the world, the sample size was small and may not be representative or generalisable. The questionnaire only had face and content validity and further validation is recommended before it is used in other studies.

Conclusion

Eating preferences differ between developed and developing countries. High intakes of fat, sugar, calorie-dense and processed foods, large portion sizes, and frequent snacking were common in developed countries. Low intake of fruits and vegetables and high intake of cereals and starch occurred in developing countries. Some foods were used for their medicinal properties, especially bitter gourd. This study reinforces the differences in eating preferences among people from different regions. In a multicultural society where people from different regions coexist, it is important that health professionals consider and understand traditional foods beliefs and practices and identify acceptable and accessible healthy food options before starting any form of intervention. ■

Acknowledgements

We wish to thank Mary McGill, Anne Belton, and Dr Sheridan Waldron from IDF DECS for their support in planning and conducting the survey. We wish to also thank all those who took part in the survey by distributing or responding to the questionnaires.

Ahmad N et al (1999) *Bangladesh Medical Research Council Bulletin* **25**: 11-3
 Bray GA (2004) *Journal of Clinical Endocrinology & Metabolism* **89**: 2583-9
 Drewnowski A, Darmon N (2005) *Journal of Nutrition* **135**: 900-4
 Drewnowski A (2007) *Epidemiologic Reviews* **29**: 160-71
 Farooqi A et al (2000) *Family Practice* **17**: 293-7
 Freimer N et al (1983) *Western Journal of Medicine* **139**: 928-33
 French SA (2003) *Journal of Nutrition* **133**: 841S-843S
 French SA et al (2001) *American Journal of Public Health* **91**: 112-7
 Furst T et al (1996) *Appetite* **26**: 247-66
 Galasso P et al (2005) *Diabetes Educator* **31**: 719-25
 Glanz K et al (1998) *Journal of the American Dietetic Association* **98**: 1118-26
 Hawkes C (2006) *Globalization and Health* **2**: 4
 IDF (2006) *International Curriculum for Diabetes Health Education*. IDF, Brussels
 International Monetary Fund (2006) *World Economic Outlook Database*. International Monetary Fund, Washington
 Ismail AI et al (1997) *Community Dentistry and Oral Epidemiology* **25**: 438-43
 Jabs J, Devine CA (2006) *Appetite* **47**: 196-204
 Krawinkel MB, Keding GB (2006) *Nutrition Reviews* **64**: 331-7
 Kuriyan R et al (2007) *Diabetes Care* Epub ahead of print
 Leatherdale BA et al (1981) *BMJ* **282**: 1823-4
 Levine AS et al (2003) *Journal of Nutrition* **133**: 831S-834S
 Lowenberg ME (1970) *Food Technology* **24**: 751-7
 Maslow AH (1943) *Psychological Review* **50**: 370-96
 Mealey BL (2006) *Journal of the American Dental Association* **137**: 26S-31S
 Murcott A (1982) *Proceedings of the Nutrition Society* **41**: 203-10
 National Institutes of Health (2004) *Strategic Plan for Obesity Research*. National Institutes of Health, Bethesda
 Popkin BM (2006) *American Journal of Clinical Nutrition* **84**: 289-98
 Ritchie J, Spencer L (1994) In Bryman A Burgess R (Eds) *Analysing Qualitative Data*. Routledge, London
 Rozin P (1990) *Nutrition Reviews* **48**: 107-113
 Shepherd R (1999) *Proceedings of the Nutrition Society* **58**: 807-12
 Staffleu A et al (1995) *Appetite* **25**: 201-16
 Subbulakshmi G, Naik M (2001) *Bombay Hospital Journal* **43**: 548-61
 WHO (2003) *Traditional medicine*. WHO, Switzerland
 Yeh GY et al (2003) *Diabetes Care* **26**: 1277-94

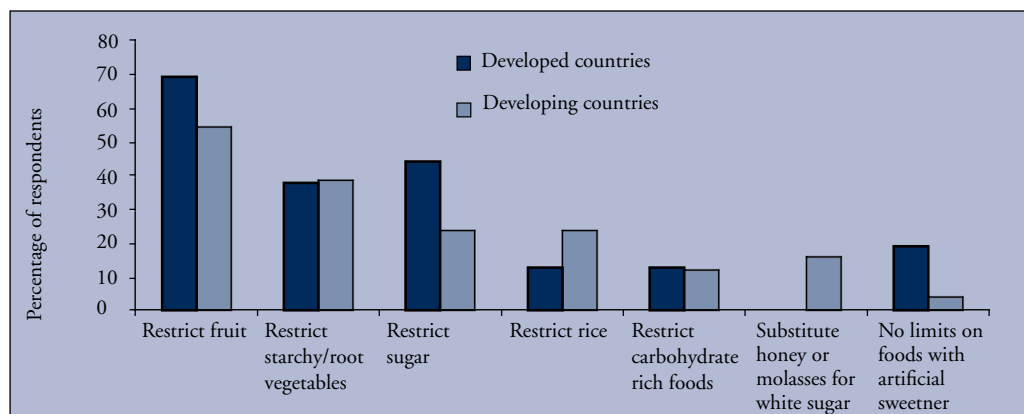


Figure 2. Comparison of health professionals' perceptions of food beliefs held by people with diabetes between developed and developing countries.