Influence of national culture on diabetes education in Malta: A case example

Cynthia Formosa, Kevin Lucas, Anne Mandy, Carmel Keller

Diabetes is a condition of particular importance to the Maltese population. Currently, 10% of the Maltese population has diabetes, compared with 2–5% of the population in the majority of Malta's neighbouring European nations (Rocchiccioli et al, 2005). The high prevalence of diabetes results in nearly one out of every four deaths of Maltese people occurring before the age of 65 years (Cachia, 2003). In this article we explore the possible contributions of the unique Maltese culture to the epidemiology, we hope that some lessons can be taken when attempting educational interventions in people of differing backgrounds.

The reasons why Malta has such a high incidence and prevalence of diabetes are complex. The Maltese population is the result of the inter-marrying between peoples of the various cultures and nations that have occupied the island through the ages. Eating habits are rooted in traditional culture. The apparent gradual steady increase of type 2 diabetes' prevalence in Malta during the late nineteenth to early twentieth centuries has been associated with drastic changes in dietary habits and food availability. During the nineteenth century, the majority of the population existed on large quantities of barley bread and wine, supplemented by olives, oil, onions, garlic, cheese and very little fish or meat. In season, melons, prickly pear and raw vegetables were abundant, but meat was rarely affordable. It was not before the turn of the twentieth century that living conditions started to improve for ordinary Maltese people (Savona-Ventura, 2001).

Extensive social disruption was brought about by lengthy blockades that occurred during the Second World War, resulting in near starvation for many Maltese people. The initial response to the blockade was an apparent increase in mortality from diabetes reaching a peak of 86.6 per 100 000 population in 1942. This sudden surge in mortality was possibly a result of difficulties in maintaining adequate clinical management of the more severe cases of diabetes. The immediate post-war years witnessed an apparent fall in mortality of 23 per 100 000 population by 1948. This fall may have been partly a result of the previously high selective mortality pattern. It may also have been in response to the subsequent better control of surviving people with diabetes following the

Article points

1. This study aimed to explore whether or not diabetes education improved knowledge, HbA_{1c} and cholesterol levels in Maltese people with type 2 diabetes.
2. There was no difference between the intervention and control groups in any of the metabolic parameters.
3. Sophisticated programmes that take account of the unique nature of Maltese culture are necessary to bring about behavioural and metabolic changes in this group.

Key words

- Education
- National culture
- Metabolic parameters

Cynthia Formosa is a Podiatry Co-ordinator at the University of Malta, Kevin Lucas is a Senior Lecturer in Health Psychology, Anne Mandy is a Principal Research Fellow and a Research Student Division Leader and Carmel Keller is a Principal Lecturer at the Institute of Post-graduate Medicine. All are based at the University of Brighton.

Page points

1. In the 1950s, Maltese cooking had been described as 'sub-Italian, monotonous and drab'. It included a high proportion of starch and fat that adversely affected the physical appearance of the majority of the Maltese by their mid-twenties.
2. It has been hypothesised that type 2 diabetes is a particular risk in populations who have experienced cycles of feast and famine, as the Maltese have repeatedly done.
3. People eligible for this study were Maltese, aged between 45 and 65 years, living with type 2 diabetes according to the WHO criteria, and had never attended a diabetes education program in the past.
4. Group diabetes education sessions were held in the diabetes clinic, St. Luke's Hospital, Malta.

period of dietary restrictions during the war years (Savona-Ventura, 2001).

The later post-war period saw an improvement in the social conditions for the Maltese population. In the 1950s, Maltese cooking had been described as 'sub-Italian, monotonous and drab'. It included a high proportion of starch and fat that adversely affected the physical appearance of the majority of the Maltese by their mid-twenties. The continuing presence of the British resulted in the introduction of foods such as fried eggs, bacon and chips into the Maltese diet. Nutritional studies carried out in 1981 confirmed that the Maltese were consuming large quantities of food with an average individual's daily intake at 6.5–8.5 MJ. With the improvement of the financial status of the population after the post-war years, the specific mortality rate from diabetes rose markedly, reaching a peak of 129.2 per 100 000 population in 1975 (Savona-Ventura, 2001).

There is sufficient evidence to attribute the late nineteenth to early twentieth century increase in cause-specific mortality rates and presumed increased prevalence of diabetes to a change from a thrifty Mediterranean diet to a relatively abundant Anglo-Italian one (Neel et al 1998; Savona-Ventura, 2001). Prior to the twentieth century, the Maltese had adapted to a physiology best suited for a diet based mainly on unrefined carbohydrates. This adaptation of physiology in some individuals enabled those with the adaptation to be more likely to survive during periods of restricted diet, a phenomenon that has been described as the 'thrifty genotype' (Neel et al, 1998). Neel and colleagues suggest that the increase in fat and refined carbohydrate intake that occurred during the late twentieth century 'overloaded' such individuals, giving rise to the observed increased incidence of obesity, increased peripheral insulin resistance and consequent higher prevalence of type 2 diabetes in the Maltese population. For similar reasons, the anthropologist Robert Ferrell has hypothesised that type 2 diabetes is a particular risk in populations who have experienced cycles of feast and famine, as the Maltese have repeatedly done (NMSU, 1998). Moreover, the history of early population movements in the Mediterranean region suggests a possible Semitic and Middle Eastern contribution to the genetic pool of countries such as Malta where diabetes is more frequent. In Cyprus, Israel, Italy, San Marino and Turkey, a positive history of diabetes in first-degree relatives was found in 34–45 % of people with diabetes but only in 15–20 % of the general population (Schranz, 1997). The situation is complicated further by the fact that the vast majority of Maltese people marry and have children with others from within the Maltese population.

Despite the high prevalence of diabetes in Malta, no studies to date have explored the possible contributions of the unique Maltese culture to these epidemiological findings.

Methods

This study was approved by the University of Brighton Research Ethics Committee and by the University of Malta Ethics Board. Individuals were recruited from the diabetes outpatient clinic, St Luke's Hospital, Malta. This hospital is the only public hospital on the island and is the sole provider of diabetes education in Malta. It is estimated that an average of 1100 people from all over Malta visit the diabetes outpatient clinic at St Luke's Hospital every month, the majority of whom present with type 2 diabetes (Azzopardi and Grixti, 2000). People eligible for this study were Maltese, aged between 45 and 65 years, living with type 2 diabetes (type 2 diabetes defined using World Health Organization [WHO] criteria), and had never attended a diabetes education program in the past. People at the top of the waiting list for the programme were invited to participate as the intervention group while those lower down the waiting list were used as the control group. Both groups provided consent to participate in the study.

Group diabetes education sessions were held in the diabetes clinic, St. Luke's Hospital, Malta. Sessions were held on Saturdays for a period of four consecutive weeks. Sessions were 90 minutes in duration and usually run continuously throughout the year, except for the months of July and August when the weather was too hot. The content consisted of

information about various aspects of diabetes management that were delivered variously by a consultant diabetologist, a diabetes specialist nurse, a dietitian and a podiatrist. Sessions were delivered in a large lecture room that was well aerated and had good light and a friendly atmosphere. Participants were encouraged to ask questions and share their experiences in diabetes self-management. Educational leaflets were also distributed after the sessions.

Procedure

Sample size was determined by the use of a power calculation using fasting blood glucose and HbA_{1c} values at 95% confidence (Gagliardino et al, 2001). In total, 50 people were recruited into each of the two groups. Participants were matched for gender, educational level attained, current medication taken and marital status. No more than a 5-year difference was accepted for age or duration of diabetes for people matched in the two groups. Blood samples and measurements were taken at first interview and 3 months later in both the intervention and the control groups.

Outcome measures

The outcome variables measured for both groups before and after the intervention were HbA_{1c}, blood pressure, weight and diabetes knowledge, together with a full lipid profile including high-density lipoprotein (HDL) cholesterol, low-density lipoprotein (LDL) cholesterol and triglycerides. Diabetes knowledge was assessed by means of the Diabetes Knowledge Questionnaire (DKQ-24; Meadows et al, 2000). This scale was developed for use with people who have type 2 diabetes and it is a reliable and valid measure that is relatively easy to administer (Garcia et al, 2001). The contents of this questionnaire were read to the participants in one-to-one interviews in their language of preference (English or Maltese). When translating the DKQ-24 into the Maltese version, the 'back translation' method was used. This method has been used extensively in translations of questionnaires across many countries in order to ensure reliability and validity and is described in detail elsewhere (Leung and Arthur, 2000; Frosch et al, 2001; Halepota and Wasif, 2001; Nusbaum et al, 2001).

Statistical analysis

The data were analysed using SPSS version 14. Normality of distribution was established using a Kolmogorov Smirnov test.

Results

Metabolic parameters

No within-group statistical differences were found in any of the metabolic parameters from before the intervention to 3 months after a period of diabetes education, with the exception of HDL-cholesterol and triglycerides, both of which showed a significant increase. Within-group differences were only found in weight for the control group over the same period. *Table 1* shows the results for metabolic parameters in both groups. *Table 2* shows between-group comparisons.

Diabetes knowledge scores

During interviews, all participants chose to

Page points

1. Participants were encouraged to ask questions and share their experiences in diabetes self-management. Educational leaflets were also distributed after the sessions.
2. In total, 50 people were recruited into each of two groups. Subjects were matched for gender, educational level attained, current medication taken and marital status.
3. The outcome variables measured for both groups before and after the intervention were HbA_{1c}, blood pressure, weight and diabetes knowledge, together with a full lipid profile including high-density lipoprotein (HDL), low-density lipoprotein (LDL) and triglycerides.
4. No within-group statistical differences were found in any of the metabolic parameters from before the intervention to 3 months after a period of diabetes education, with the exception of HDL and triglycerides, both of which showed a significant increase.

Table 1. Metabolic parameters.

Variable	Mean intervention group before (n = 48)	Mean intervention group after (n = 48)	t test	p value	Mean control group before (n = 46)	Mean control group after (n = 46)	t test	p value
Weight (kg)	77.6 (15.6)	77.93 (14.9)	0.6	<0.5	79.78 (15.7)	80.01 (14.1)	2.4	<0.01*
Total serum cholesterol	5.3 (1.1)	5.5 (1.2)	0.8	<0.3	5.33 (0.9)	5.1 (1.1)	1.3	<0.1
LDL	3.2 (1.0)	3.1 (1.0)	0.9	<0.3	3.1 (0.8)	2.9 (0.9)	1.9	<0.06
HDL	1.3 (0.3)	1.4 (0.3)	2.3	<0.02*	1.4 (0.3)	1.4 (0.3)	0.3	<0.7
Triglycerides	1.7 (1.1)	1.9 (1.3)	2.1	<0.02*	1.6 (0.6)	1.6 (0.8)	0.4	<0.7
HbA_{1c}	6.8 (1.4)	7.1 (1.6)	1.8	<0.07	7.6 (1.9)	7.4 (1.6)	0.9	<0.3

**statistically significant differences (P < 0.05; paired sample t-test); numbers in brackets indicate standard deviation.*

Table 2. Between-group comparison.

Variable	Mean intervention group before (n = 50)	Mean control group before (n = 50)	t test	p value	Mean intervention group after (n = 48)	Mean control group after (n = 46)	t test	p value
Weight (kg)	77.6 (15.6)	79.78 (15.7)	0.7	<0.5	77.93 (14.9)	80.01 (14.1)	0.7	<0.5
Total serum cholesterol	5.3 (1.1)	5.33 (0.9)	0.3	<0.7	5.5 (1.2)	5.1 (1.1)	1.4	<0.1
LDL	3.2 (1.0)	3.1 (0.8)	0.3	<0.7	3.1 (1.0)	2.9 (0.9)	1.1	<0.2
HDL	1.3 (0.3)	1.4 (0.3)	1.0	<0.3	1.4 (0.3)	1.4 (0.3)	0.1	<0.8
Triglycerides	1.7 (1.1)	1.6 (0.6)	0.8	<0.4	1.9 (1.3)	1.6 (0.8)	1.1	<0.2
HbA_{1c}	6.8 (1.4)	7.6 (1.9)	2.1	<0.03*	7.1 (1.6)	7.4 (1.6)	0.9	<0.3

**statistically significant differences (P < 0.05; 2 sample independent t test); numbers in brackets indicate standard deviation.*

Table 3. Diabetes knowledge scale scores.

DKQ-24	Before	After	t value	p value
Intervention group	15.6	18.1	7.8 (47)	<0.001
Control group	15.0	17.8	6.5 (45)	<0.001

Numbers in brackets indicate standard deviation.

Page points

1. There was a significant improvement in knowledge scores for both groups from baseline knowledge. However, no significant differences in knowledge scores were found between the groups when they were compared both at baseline and after 3 months.
2. Successful management of diabetes requires an understanding of the lifestyle, beliefs, attitudes, family and social networks of the people concerned.
3. Malta's historical diversity, climate and culture have resulted in a people who value cafe and restaurant life in which eating out with families is particularly important, especially at weekends.
4. No fewer than 90 feasts are celebrated every year throughout the island, and people crowd the streets in all-night celebrations..

be interviewed in Maltese. The results of the DKQ-24 demonstrated that the mean score for the intervention group before attending the diabetes programme was 65 %, which increased to 75 % after 3 months. However, the mean score for the control group also increased from 61 % to 74 % over the same period. *Table 3* shows diabetes knowledge for both groups.

Diabetes knowledge scores were compared for each group at the beginning of the study and after 3 months. There was a significant improvement in knowledge scores for both groups from baseline knowledge. However, no significant differences in knowledge scores were found between the groups when they were compared both at baseline ($t = 7.9$; $df = 98$; $P < 0.43$) and after 3 months ($t = 5.1$; $df = 92$; $P < 0.6$).

Discussion

Previous studies of diabetes education programmes have reported conflicting results (Norris et al, 2001; Tankova et al, 2003; Ellis et al 2004; Persell et al, 2004; Trento et al, 2004). The NHS has recently embarked on a new diabetes self management programme: the Diabetes Education and Self Management for On going and Newly Diagnosed (DESMOND) (Lucas and Walker, 2004). DESMOND follows the NICE recommendations for evidence based group education programmes. The programme is underpinned by a philosophy which is dedicated to empowering people with diabetes to take the lead in self-managing their condition (Lucas & Walker 2004). Initial studies using DESMOND have shown some short-term, limited success on diabetes health beliefs (P = 0.05 – P = 0.006) (Skinner et al 2006); further work is still needed. [***Editors note: this paper was submitted, peer-reviewed and accepted for publication before the recent publication of the DESMOND randomised controlled trial.***] The diabetes X-PERT programme in the UK has been more systematically developed and aims to develop a patient-centred, group based, self-management programme based on theories of empowerment and discovery learning which are characterised by a focus on lifestyle and psychosocial outcomes (Deakin et al, 2006). Early results indicate a medium term impact on clinical parameters.

Few studies have demonstrated any effect of educational interventions that last longer than 6 months after the intervention (Duke Clinical Research Institute, 2005; Mauldon et al, 2006; Adolfsson et al, 2007). This is the first study to explore such issues in Malta and highlights the fact that improving knowledge alone does not necessarily result in people changing their behaviours, or in improved glycaemic control, cholesterol levels or weight management (Subratty et al, 2004; Duke Clinical Research Institute, 2005).

However, culture is known to strongly influence behaviour (Lifshitz, 2006). Although the Maltese culture is broadly Mediterranean in nature, it is also very distinctive, having its own blend of historical and economic traditions that have left their mark on the values, motivations, expectations and practices which characterise the Maltese population. Successful management of diabetes requires an understanding of the lifestyle, beliefs, attitudes, family and social networks of the people concerned. Maltese culture is that which makes the Maltese people unique and that which distinguishes them from their European neighbours.

Malta's historical diversity, climate and culture have resulted in a people who value cafe and restaurant life in which eating out with families is particularly important, especially at weekends. Moreover, the Maltese people are overwhelmingly Roman Catholic (98 %) and the influence of the Church is extremely strong amongst the Maltese people (Baldacchino, 2000). Maltese feast days (variously dedicated to the patron saint of every town and village) emerged into the present form during the nineteenth century. The feast celebrations start 9 days before the actual feast (Benoit, 2004), and the feast season lasts from May to September. No fewer than 90 feasts are celebrated every year throughout the island, and people crowd the streets in all-night celebrations. Today, the village feasts are highly commercialised, with mobile kiosks selling hot-dogs, ice-creams, burgers, kebabs, chips and all sorts of Maltese fast food, including 'mqaret' (pastry stuffed with dates fried in oil) and nougat with almonds or peanuts. The types of food available during these feasts are generally high in fat, sugar and salt, but the feasts are a vitally important part of cultural and religious life. Furthermore, Maltese migrants to the UK, Australia and Canada still continue their traditions several generations on (Camilleri, 2003).

This study has highlighted the fundamental importance of sensitivity to people's cultural identity when attempting educational interventions. The complexity of behavioural change in health promotion strategies is well known and extensively documented. In general, simple information-providing approaches are unlikely to bring about lasting change (Lucas and Lloyd, 2005). Helping people with diabetes to manage their condition may alleviate, to some extent, the financial and personal burdens of diabetes for the Maltese population. However, in order for this to be achieved, we must learn to not only address medical aspects of chronic disease but encompass the psychosocial and cultural factors as well. ■

Acknowledgements

The authors are grateful for Alexandra A Garcia who gave permission to use the DKQ-24 questionnaire.

Page points

1. This study has highlighted the fundamental importance of sensitivity to people's cultural identity when attempting educational interventions.
2. Helping people with diabetes to manage their condition may alleviate, to some extent, the financial and personal burdens of diabetes for the Maltese population.
3. In order for this to be achieved, we must learn to not only address medical aspects of chronic disease but encompass the psychosocial and cultural factors as well.

Adolfsson ET, Walker-Engström ML, Smide B, Wikblad K (2007) Patient education in type 2 diabetes: a randomized controlled 1-year follow-up study. Diabetes Research and Clinical Practice 76: 341–50

Azzopardi J (2003) Personal correspondence. St Luke's Hospital, G'Mangia, Malta

Azzopardi J, Grixti M (2000) Department of Health Diabetes Services Report Malta, St Luke's Hospital, G'Mangia, Malta

Baldacchino G (2000) Introducing Social Studies: A Maltese Reader. PEG Publications, Malta

Benoit M (2004) It's festa time. Available at: http://www.aboutmalta.com/grazio/festatime.html (accessed 16.03.2008)

Cachia JM (2003) Providing Healthcare Abroad: The Maltese Experience. Health Care & Mobility in an Enlarged Europe. AIM&VZAJEMNA International Conference, Ljulbjana, Slovenia, 7th November 2003

Camilleri V (2003) Preservation of Maltese Culture and Language in the United Kingdom. Available at: http://www.maltamigration.com/about/foma/convention2000/full/topic2f.shtml?s=C39E5 (accessed 16.03.2008)

Deakin TA, Cade JE, Williams R, Greenwood DC. (2006) Structured Patient Education: the diabetes X-PERT Programme makes a difference. Diabetes Medicine 23: 933–4.

This study has highlighted the fundamental importance of sensitivity to people's cultural identity when attempting educational interventions.

Duke Clinical Research Institute (2005) Diabetes knowledge has little effect on improving outcomes. Available at: http://www.news-medical.net/?id=10666 (accessed 15.04.2008)

Ellis SE, Speroff T, Dittus RS et al (2004) Diabetes patient education: a meta-analysis and meta-regression. Patient Education and Counseling 52: 97–105

Frosch D, Porzsolt F, Heicappell R et al (2001) Comparison of German language versions of the QWB-SA and SF-36 evaluating outcomes for patients with prostate disease. Quality of Life Research 10: 165–73

Gagliardino JJ, Etchegoyen G; PENDID-LA Research Group (2001) A model educational program for people with type 2 diabetes: a cooperative Latin American implementation study (PEDNID-LA). Diabetes Care 24: 1001–7

Garcia AA, Villagomez ET, Brown SA et al (2001) The STARR County diabetes Education Study. Diabetes Care 24: 16–21

Halepota AA, Wasif SA (2001) Hopkins Symptoms Checklist 25(HSCL-25) Urdu translation: an instrument for detecting anxiety and depression in torture and trauma victims. Journal of the Pakistan Medical Association 51: 255–7

Leung SF, Arthur D (2000) The alcohol use disorders identification test (AUDIT): validation of an instrument for enhancing nursing practice in Hong Kong. International Journal of Nursing Studies 37: 57–64

Lifshitz A (2006) Cultural Awareness: A prescription for more effective medicine. Medscape General Medicine 8: 17

Lucas K, Lloyd B (2005) Health promotion: Evidence and experience. Sage Publications, London.

Lucas S, Walker R (2004) An overview of diabetes education in the United Kingdom: past, present and future. Practical Diabetes International 21: 61–4

Mauldon M, Melkus GD, Cagganello M (2006) Tomando Control: a culturally appropriate diabetes education program for Spanish-speaking individuals with type 2 diabetes mellitus – evaluation of a pilot project. The Diabetes Educator 32: 751–60

Meadows KA, Abrams C, Naditch L (2000) Diabetes-related knowledge of type 2 diabetes – Preliminary findings from an International Survey. Health and Survey Research Unit. Applied Statistics Centre, University of England.

Neel JV, Weder AB, Julius S (1998) Type II diabetes, essential hypertension, and obesity as "syndromes of impaired genetic homeostasis": the "thrifty genotype" hypothesis enters the 21st century. Perspectives in Biology and Medicine 42: 44–74

NMSU (1998) Genetics of Type 2 diabetes. Available at: http://darwin.nmsu.edu/~molbio/diabetes/disease.html (accessed on 16.03.2008) Norris SL, Engelgau MM, Narayan KM (2001) Effectiveness of self-management training in type 2 diabetes: a systematic review of randomized controlled trials. Diabetes Care 24: 561–87

Nusbaum L, Natour J, Ferraz MB, Goldenberg J (2001) Translation, adaptation and validation of the Roland-Morris questionnaire – Brazil Roland-Morris. Brazilian Journal of Medical & Biological Research 34: 203–10

Persell SD, Keating NL, Landrum MB et al (2004) Relationship of diabetes-specific knowledge to self-management activities, ambulatory preventive care, and metabolic outcomes. Preventive Medicine 39: 746–52

Rocchiccioli TJ, O'Donoghue CR, Buttigieg S (2005) Diabetes in Malta: Current Findings and Future Trends. Malta Medical Journal 17: 16–9

Savona-Ventura C (2001) Diabetic disorders in the Maltese Population. Available at: http://www.geocities.com/hotsprings/2615/epidemiology/diabetes.html (accessed 15.04.2008)

Schranz A (1997) The epidemiology of Diabetes in Malta. Diabetes/Metabolism Reviews 13: 181–99

Skinner TC, Carey ME, Cradock S, et al (2006). Diabetes education and self-management for ongoing and newly diagnosed (DESMOND): process modelling of pilot study. Patient Education and Counselling 64: 369–77.

Subratty AH, Cheekoory R, Fakira-Jhurry A (2004) A need for effective health education programme for diabetic patients in Mauritius. Nutrition & Food Science 34: 113–5

Tankova T, Dakovska G, Koev D (2003) Education and quality of life in diabetic patients. Patient Education and Counseling 53: 285–90

Trento M, Passera P, Borgo E et al (2004) A 5-year randomized controlled study of learning, problem solving ability, and quality of life modifications in people with type 2 diabetes managed by group care. Diabetes Care 27: 670–5

WHO (1985) Diabetes Mellitus. Report of a WHO study group. Technical report series 727. Geneva