

ORIGINAL COMMUNICATION

Nontraditional nutrition education interventions: the radio ECCA method

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Objective: To evaluate a nutrition education intervention using a radio programme in the Canary Islands.

Design: Pre–post quasiexperimental epidemiological study.

Setting: Free living population in the Canary Islands, Spain.

Subjects: A sample of 1753 individuals out of 6846 volunteers participating in the educational programme.

Interventions: A 6-week radio programme consisting of 12 didactic units with supplementary print support material and four optional attendance-based healthy cooking seminars.

Results: At 2 months postintervention, an increased consumption of pulses, salads, fruits and juices, cereals and fish, and a decreased consumption of meat, sausages, pastries, French fries, bread and eggs were observed.

European Journal of Clinical Nutrition (2003) **57**, Suppl 1, S86–S89. doi:10.1038/sj.ejcn.1601811

Keywords: nutrition education; evaluation; radio; community participation; Canary Islands

Introduction

The Canary Islands have not been exempt from the changes in food habits occurring in developed countries. Modifications have included a progressive increase in the consumption of animal foods, high intakes of energy dense processed products with a simultaneous decrease in plant-based foods. Important lifestyle changes have also taken place as well as a progressive decrease in physical activity and energy expenditure. The Canary Island Nutrition Survey (Serra Majem, 2000) demonstrated inadequate and unhealthy dietary patterns and lifestyle habits requiring the following recommended modifications: increase consumption of fruits and vegetables, fish, pulses, bread, pasta, *gofio* (toasted corn or wheat flour), rice and other cereals, preferably in wholegrain form; reduce consumption of industrial baked goods and

whole-milk dairy products; choose olive oil over other vegetable oils; moderate intakes of meat, fat and derivatives; and the promotion of healthy breakfasts and snacks.

The Healthy Nutrition Regional Commission, in conjunction with the General Direction of Public Health, issued recommendations for a programme targeting the general public to be undertaken, taking into account the Canary Island Health Plan objectives. The Canarian Health Service and the Foundation ECCA (Emisora Cultural de Canarias) designed the nutrition education programme 'Healthy food, nutrition and cuisine' (Alimentación y cocina saludable). This programme featured the innovation of imparting distance education via radio, for which Foundation ECCA was responsible. The course's general objectives were to: (a) enhance the health and quality of life of the Canary Island population through improved dietary habits, (b) empower participants to appraise customary food habits in the light of healthy nutrition principles and (c) provide health professionals with a tool to facilitate the integration of promoting healthy nutrition as part of their usual tasks.

The purpose of this study was to evaluate the effectiveness of the 'Healthy food, nutrition and cuisine' programme in effectuating changes in food and nutrition habits in the Canary Islands.

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ECCA METHODOLOGY

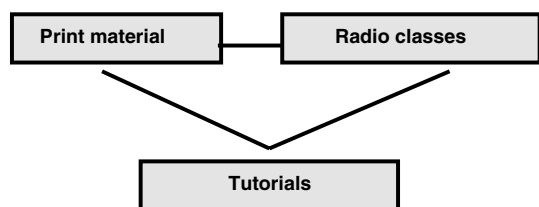


Figure 1 The ECCA method used in the nutrition intervention.

Materials and methods

The programme designed by Foundation ECCA consisted of 12 didactic units that included the following elements: radio class and printed support material (class content, explanatory notes, glossary, bibliography, questionnaires, evaluation and healthy cooking recipes); optional participation in healthy cooking workshops conducted throughout the Islands. A total of 29 workshops were held once a week for 4 weeks, in which healthy menus were prepared under the supervision of project culinary staff. They were held as part of the project's face-to-face tutorials, although tutorials were also conducted by telephone or by correspondence (see Figure 1). Thus far, two courses have been implemented, each one lasting 6 weeks (two classes/week), from 15 May to 21 June in both 2001 and 2002.

Each of the 12 units targeted issues identified in the Canary Island Nutrition Survey. Apart from components of healthy nutrition and a balanced diet, additional topics included physical activity, nutrition throughout the life cycle, food shopping and food safety.

Design

A pretest–post-test design with only one group as described by Campbell and Stanley (1982) was conducted, with a pretest before and post-test 2 months after the intervention.

Sample

The sampling frame consisted of the population that had participated in both courses, comprising 6846 individuals. The final sample included a total of 1753 participants (25.6%), selected from the two courses and representing all areas of the Canary Islands.

Measurement tools

An especially designed self-administered food frequency questionnaire was administered consisting of a closed food

list with frequency of consumption indicated per week. Weekly intake was converted into daily consumption, taking into account portion sizes and food group definitions (dairy; protein foods; cereals and pulses; fruits and fruit juices; and vegetables) (Requejo & Ortega, 2003). Validity was evaluated using the Kuder–Richardson method (0.799).

Statistical analysis

Descriptive analyses were conducted for all data, using proportions for qualitative variables and means, standard deviations and medians for quantitative variables. Other analyses included paired Student's *t*-test, Wilcoxon and paired McNemar tests.

Results

The majority of course participants were female (90%), between 25 and 44 y old (80%) with elementary-high school education (83%).

Results are shown in Table 1. Physical activity was significantly increased ($P < 0.001$) pre–post-test, as well as increased consumption of stews, juices, cereals, salads, fruits and fish and a decreased intake of soft drinks, pork and sausages, chicken, industrial baked goods, french fries and bread.

When compared to recommended daily intake for food groups, the following significant differences were observed pre- and post-test: increased intake of fruits, fruit juices and vegetables and a decrease in meat group consumption. There

Table 1 Weekly food consumption pre–post-test results* ($n=1753$)

	Pre-test	Post-test	Significance (95%)
Rice	2.06	2.05	NS
Cereals	1.54	2.04	$P < 0.001$
Bread	5.18	4.94	$P < 0.001$
Baked potatoes	2.17	2.20	NS
French fries	1.67	1.44	$P < 0.001$
Pulses (beans)	2.06	2.10	NS
Vegetable stew	3.07	3.21	$P < 0.006$
Salads	3.81	4.25	$P < 0.001$
Fruits	6.54	6.88	$P < 0.001$
Fruit juice	3.47	3.73	$P < 0.004$
Nuts	1.18	1.21	NS
Fish	1.99	2.13	$P < 0.001$
Red meat	0.59	0.63	NS
Pork	0.64	0.57	$P < 0.001$
Chicken	1.72	1.67	$P < 0.03$
Rabbit	0.19	0.21	NS
Eggs	2.26	2.18	$P < 0.004$
Sausages	2.58	1.97	$P < 0.001$
Yoghurt	4.79	4.83	NS
Cheese	3.51	3.46	NS
Soft drinks	1.68	1.44	$P < 0.001$
Baked goods	1.54	1.04	$P < 0.001$

*Wilcoxon test. NS=nonsignificant.

were also decreases in dairy, pulse and cereal intakes although not at significant levels.

With respect to differences by age group, the only significant finding was in fruit and fruit juice intake, with those aged 25–34 and 14–24 y having greater increases in consumption. Those coming from higher education levels also comprised the segment with significant increases in fruit and juice intakes.

Discussion

The 'Healthy food, nutrition and cuisine' programme was an important endeavour to improve previous nutrition education models applied in the Canary Islands. Earlier efforts focused almost exclusively on information being provided by institutions implementing the interventions. The 'Healthy food, nutrition and cuisine' programme effectively incorporated principles of persuasive communication as well as appropriate communication channels such as the radio and techniques in group settings, the latter being critical in the process of education and changing ideas (Lewin, 1948). Moreover, a fundamental approach of the programme was to recognise that all individuals have the capacity to identify their health problems and means to resolve them. It is not easy, however, to evaluate these types of programmes due to their multiple facets as well as the statistical weakness inherent in quasiexperimental designs, especially those evaluating changes in dietary habits (Garrard, 1992).

Generally speaking, up to the present, the radio has played an important role in nutrition education, albeit with limited effectiveness due to its unidirectional nature (Tones, 1985). Nevertheless, in this programme, it was applied within a bidirectional context as dialogue between teacher and student was made possible along with group interaction (Modolo, 1980). Furthermore, the use of structured and systematic support material congruent with beliefs and positive motivations enhanced behavior change (Contento *et al*, 2002). Positive experiences with mass media have also been demonstrated elsewhere. In Australia, healthy cooking workshops were also conducted in tandem (Scott *et al*, 1991) and in the California (USA) '5 a day for better health' programme, part of the National Cancer Institute's campaign, mass media efforts were sponsored by health authorities and supermarket chains (Foerster *et al*, 1995). In Holland, a 4-year programme to reduce fat consumption that utilised the radio also included collaborations from social organisations as well as health authorities and the food industry (Van der Feen *et al*, 1998). In a British 6-month intervention programme utilising radio and TV to reduce obesity within a sample of 6000 adults, participants significantly increased fruit and vegetable intake and physical activity with accompanying weight loss (Miles *et al*, 2001). However, in our study, fruit and vegetable consumption is still low after the intervention (2.6 portions

per day), although increased by 10% (2.4 portions per day before the intervention).

Use of the radio in conjunction with face-to-face interactions, such as groups and tutorials, are key elements of success in these types of nutrition interventions. The Stanford Five City Project on cardiovascular health showed that those communities simultaneously applying both person-to-person interaction and mass media had better outcomes than those using only one method, with significant improvements in food consumption and their consequent implications for community health (Fortmann & Varady, 2000). Nonetheless, this experience also demonstrated the importance of including initiatives that address food availability to maximise the progress achieved in knowledge and motivation. Use of the radio in Mexico to effectuate changes in knowledge and attitudes was also effective (Cabrera-Piraval *et al*, 2002).

Participation in the 'Healthy food, nutrition and cuisine' programme was either on an individual or group (healthy cooking workshops) basis. However, only 15% of the participants in each course opted for group involvement. In summary, nutrition education initiatives should include three basic elements: (a) concrete messages addressing specific aspects of the nutrition issue, (b) application of social communication techniques and (c) maximum participation of the target community (Dehollain *et al*, 1983). As a final point, health authorities should also assume the responsibility to investigate, plan, implement and evaluate future interventions of educational communication incorporating novel methodologies that go beyond traditionally applied methods.

Acknowledgements

We express our appreciation for the collaboration of the Canarian Health Service and the Foundation Radio ECCA, along with the team participating in the programme. We also thank Joy Ngo for her help with editing the English manuscript.

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