

Knowledge, opinions and behaviours related to food and nutrition in Catalonia, Spain (1992–2003)

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Abstract

Objectives: The main purpose of this study was to evaluate the modification of knowledge, opinions and attitudes to healthy eating, weight perception and dieting practices and preventive habits over a 10-year trend in the Catalan population from 1992 to 2003.

Design: Two cross-sectional surveys were carried out in Catalonia, Spain, during 1992–93 and 2002–03.

Subjects: In all, 2361 individuals in the ENCAT 1992–93 nutritional survey and 2061 individuals in the ENCAT 2002–03 health survey. The subjects' ages ranged from 10 to 75 years old.

Results: Lettuce and carrots, fish and olive oil were chosen as the healthiest foods in the two Catalan Nutritional Surveys. Although some improvement was reported, a high percentage of the population still thought that bread (31%), potatoes (23%) or olive oil (19%) should be moderated to prevent high blood cholesterol, especially among the youngest individuals. The perception of being overweight increased among males and decreased among females. There was an increase in the percentage of the population following a diet (from 13% to 17%). An increase in the consumption of iodine-enriched salt (from 26% to 40%) was observed as well as of diet supplements, especially among females (from 6% to 13%). The prevalence of males with diabetes increased from 3.4% to 4.5% and the number of individuals with diabetes not following any treatment decreased.

Conclusion: The Catalan population has improved their knowledge of healthy food and health-related attitudes. Nutrition policy should focus on young adults as a key age group for primary prevention of future nutrition-related chronic diseases.

Keywords
Attitudes
Beliefs
Healthy eating
Dieting practices
Spain

Acquiring correct eating habits is essential for promoting health among individuals and the population at large as well as for preventing a large number of pathologies that, to a greater or lesser extent, are nutrition related^{1–4}.

Multiple factors influence the adoption of eating habits, ranging from personal characteristics of the individual to those related to socio-cultural and psychological determinants. As such, societal food habits are determined to a large extent by cultural identification, traditions and belief systems. As evidenced by a number of studies, the influence of these factors on eating habits over the last few years has led to an unbalanced nutritional profile in Spain. This has been associated with a significant number of pathologies with marked prevalence and mortality, such as cardiovascular disease, certain cancers, obesity, osteoporosis, iron-deficiency anaemia and dental caries^{5–9}.

Educational interventions targeting the improvement of food and nutrition problems affecting the population at large constitute the main strategy for nutrition-related chronic disease prevention and control¹.

In any and all cases, it is critical to understand why people behave as they do. Especially in relation to how, in accordance with their perceptions, the reasons for their actions are justified. It is important to identify what these reasons are before initiating interventions for dietary change.

In order to achieve behaviour changes, it is critical to understand the rationale behind the conduct and the socio-cultural factors that influence it. Knowing this information enables educational programmes to be designed so as to enhance motivation for participants to want to be healthy and how to achieve it. Therefore, it is opportune to carry out studies that evaluate knowledge,

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opinions and attitudes of the target population and to identify erroneous concepts, beliefs and attitudes with the aim of designing educational programmes that are adapted to participants' needs. Moreover, this allows for tailored selection of the desired target behaviours to be modified or reinforced through the educational programme.

This study is derived from data obtained in the Catalan Nutrition Surveys of 1992–93 (ENCAT 1992–93) and 2002–03 (ENCAT 2002–03), both of which applied a similar methodology as a part of the Catalan Nutrition Monitoring system. The aim of this paper is to evaluate the modifications in three determinants of food behaviour, knowledge, opinions and attitudes, which occurred over a 10-year period as well as their distribution according to gender and age.

Methods

In ENCAT 1992–93¹⁰ the random sample population consisted of inhabitants aged 6–75 years living in Catalan municipalities. The theoretical sample size was estimated to be 3000 subjects, assuming a 70% response rate. Data were collected via two interviews. All study participants were administered a general questionnaire that compiled information about socio-economic variables (profession, level of education, etc.) as well as the following: food habits, chronic disease control, smoking, physical activity, knowledge and opinions about nutrition. This was carried out in conjunction with the realisation of two diet-assessment questionnaires. Furthermore, several anthropometric measurements were taken (body weight, height, circumferences, etc.) under standardised conditions.

In ENCAT 2002–03¹¹ study participants were administered a comprehensive questionnaire that included many of the same questions used in the ENCAT 1992–93 study¹⁰, and to which additional topics were added addressing, among others, food security and level of physical activity. The theoretical random sample population consisted of inhabitants aged 10–80 years living in Catalan municipalities, as this group comprised the population source of residents registered in the official census. As a participation rate of 70% was assumed, the theoretical sample size was estimated to be 3300 individuals (n expected = 2310). The survey was carried out from March 2002 to June 2003 in the home of the subjects being interviewed by 22 previously trained dietitians.

Questionnaires

The same questionnaires were used in the 1992–93 and 2002–03 analyses. Only individuals aged 18–75 years answered the questionnaire about food attitudes and behaviour. Some questions were also answered by individuals aged 10 years and older.

The participants' knowledge about food was evaluated by two questions. One of the questions consisted of

answering (1) 'true', (2) 'false' or (3) 'don't know' to a list of 14 foods whose consumption should be moderate or reduced to prevent high blood cholesterol. The second one consisted of rating a list of 24 foods according to their opinion that such foods had on their health: (1) being 'harmful', (2) 'indifferent', (3) 'healthy' and (4) being 'very healthy'.

Preventive actions were determined by the following questions: 'Have you ever had your (cholesterol level, blood pressure) checked?'; 'Have you ever been weighed by a doctor or nurse?'; 'Where do you usually weigh yourself?' for which the following options were given: (1) 'home', (2) 'pharmacy', (3) 'private office or public health center', (4) 'in other places', (5) 'I never weigh myself'; and lastly, 'Do you take any (diet supplements, multivitamins, iodised salt or salt enriched with iodine and fluoride)?'.

Body image was assessed by the following questions: 'Do you consider yourself as obese or overweight?' Respondents who felt obese or overweight were asked: 'Are you worried about the possible effects excess weight has on your health?' giving them the following options: (1) 'yes a lot', (2) 'quite worried', (3) 'not much', (4) 'not at all'. Two other questions were asked to the entire sample: 'What do you consider the best method for losing weight?' and the following options were given: (1) 'eating less', (2) 'not drinking alcohol', (3) 'doing more exercise', (4) 'taking pills to reduce hunger', (5) 'others'; and 'How has your weight been throughout your life?' and the following options were given: (1) 'stable' and (2) 'unstable'.

Dieting practices were evaluated as follows: 'During the past 12 months, have you ever been on a diet?' and 'Are you currently following a diet?' Those who had been on a diet were asked: 'Who prescribed the diet?' and the following options were given: (1) 'a health professional – doctor, nurse, dietitian or pharmacist', (2) 'a friend', (3) 'a family member', (4) 'a non-health professional', and (5) 'others'. Those who were following a diet were asked: 'Why are you currently on a diet?' and the following options were given: (1) 'diabetes', (2) 'hypertension', (3) 'excess weight', (4) 'cholesterol' and (5) 'others'; and 'Who prescribed the diet?' and the following answers were given: (1) 'public health centre' 'doctor', (2) 'private doctor', (3) 'hospital', (4) 'others'.

Self-reported diabetes was determined with the following question: 'Are you diabetic?' and those who were diabetic were asked: 'Which treatment are you following?' and the following answers were given: (1) 'insulin', (2) 'diet', (3) 'oral hypoglycaemic agents', (4) 'diet and insulin', (5) 'diet and oral hypoglycaemic agents', (6) 'diet, insulin and oral hypoglycaemic agents', (7) 'no treatment being used' and (8) 'doesn't know or no comment'.

Analysis of the dependent variables was realised by group comparisons. Data were compared by age and sex, using the χ^2 test for comparing proportions, and always based on the independence between variables and a 5% level of significance. The SPSS for Windows version 12.0 was used for the statistical analysis.

Results

In ENCAT 1992–93, 2361 individuals (1077 males and 1284 females) from 10 to 75 years participated in the interview, and in ENCAT 2002–03 a total of 2061 individuals (954 males and 1107 females) participated.

Tables 1–3 show results about subjects' knowledge of how foods affect health and how certain foods affect serum levels of cholesterol for the period analysed.

There was an improvement in knowledge (Table 1) of the sample population, especially with respect to blue fish (there was an increase in the percentage of people who thought it was a very healthy food, from 18% to 40%), olive oil (the percentage of people who thought it was very healthy increased from 21% to 45%) and wine (26% of people in 1992–93 thought it was healthy and the percentage increased to 45% in ENCAT 2002–03). Some food, such as pork, was not thought to be as harmful in 2002–03 (36% of people) as in 1992–93 (47%). Non-olive oils (sunflower seed oil and corn oil) were seen as more harmful in 2002–03 (from 9% to 18% for sunflower seed oil and from 11% to 27% for corn oil). Sugar also was thought to be more harmful in 2002–03 (from 16% to 19%).

In ENCAT 1992–93, most of the people thought that carrots (52% of the population), lettuce (48%) and white fish (37%) were very healthy foods, which was a common observation for all age groups and sexes (Table 2). In ENCAT 2002–03, lettuce (47%), carrots (46%), olive oil (45%) and blue fish (40%) were thought to be very healthy by most of the population. The notion that blue

fish and olive oil were very healthy foods improved in all age groups and sexes. In addition the perception that wine was a healthy food increased in all age groups and genders. The perception that whole-grain bread was very healthy decreased among males and females, and only older individuals increased their awareness that this food was healthy over the period analysed.

Table 3 shows the perception of nutrition and its effect on plasma cholesterol levels. Cured meats and cold cuts (sausages), butter, baked foods and eggs were the identified foods that should be reduced or moderated to control blood cholesterol, in the 1992–93 and 2002–03 surveys. This perception was common for all age groups and sexes. Although some improvement was observed, a high percentage of individuals from 18 to 24 years thought that olive oil consumption should be reduced (49% of population in 1992–93 and 33% in 2002–03). In ENCAT 2002–03, 30% of the same age group thought that potato consumption should be reduced so as to prevent high blood cholesterol. Individuals also thought that bread should be reduced (39% of the population in 1992–93 and 31% in 2002–03). Sardine consumption should be reduced according to the oldest age group (18% of individuals in 1992–93 and 21% in 2002–03).

Table 4 shows trends in the preventive actions of the Catalan population. There was an increase in the proportion of individuals whose cholesterol had been checked. Nevertheless, in 2002–03, 34% of the population reported that they had never checked their cholesterol levels. There was an increase in the proportion of the

Table 1 Distribution of the population (%) based on opinions of how foods affect their health (ENCAT 1992–93 and ENCAT 2002–03)

	ENCAT 1992–93 (<i>n</i> = 2075)				ENCAT 2002–03 (<i>n</i> = 1858)			
	Harmful	Indifferent	Healthy	Very healthy	Harmful	Indifferent	Healthy	Very healthy
Blue fish	6.1	15.6	60.5	17.8	0.9	6.6	53.1	39.5
Honey	1.8	10.6	55.4	32.2	2.8	16.5	57.6	23.2
Lettuce	0.2	3.2	48.2	48.4	0.2	3.9	49.3	46.7
Cooked ham	5.4	27.5	55.3	11.8	6.1	41.1	45.8	6.9
White fish	0.9	6.5	55.7	36.9	0.9	9.2	65.3	24.7
Pork	47.2	33.4	15.6	3.9	35.7	41.9	20.7	1.6
Olive oil	3.4	14.9	59.8	21.8	1.2	6.4	47.1	45.3
Sunflower seed oil	9.3	43.5	40.8	6.4	18.0	54.5	24.3	3.2
Carrots	0.3	3.3	44.5	51.9	0.2	2.8	50.9	46.1
Rice	0.8	11.0	64.1	24.1	0.7	10.1	63.2	26.1
Lamb	8.6	28.5	51.7	11.1	10.3	38.5	45.6	5.6
Pasta	3.9	24.3	56.7	15.1	1.7	16.9	62.0	19.3
Butter	32.2	41.4	24.4	2.0	45.5	39.7	13.7	1.1
Corn oil	11.0	51.9	31.2	5.9	26.6	57.4	14.6	1.4
Veal	2.9	13.5	64.3	19.3	5.1	25.2	61.8	7.9
White bread	4.9	26.0	55.4	13.7	4.1	25.0	59.1	11.8
Chickpeas	2.9	15.3	62.9	18.9	0.9	7.4	64.3	27.4
Eggs	13.7	27.8	50.5	8.0	10.7	32.8	50.7	5.8
Potatoes	3.0	20.4	61.7	14.9	2.7	24.1	61.0	12.2
Whole-grain bread	4.6	16.9	51.5	27.0	1.6	15.3	57.8	25.2
Sugar	15.9	34.8	44.6	4.6	19.2	42.0	36.1	2.7
Wine	35.1	36.5	26.1	2.3	15.8	33.0	44.5	6.7
Lard	ne	ne	ne	ne	74.9	21.4	3.4	0.3
Milk	ne	ne	ne	ne	2.6	11.3	61.6	24.5

Sample: Population aged 18–75 years.
ne – non-evaluated.

Table 2 Distribution (%) of the population according to what foods they consider as very healthy (ENCAT 1992–93 and ENCAT 2002–03)

	ENCAT 1992–93				ENCAT 2002–03				ENCAT 1992–93			ENCAT 2002–03		
	Age groups (years)				Age groups (years)				Total	Men	Women	Total	Men	Women
	18–24	25–44	45–64	65–75	18–24	25–44	45–64	65–75						
Blue fish	18.9	20.6	15.0	13.7	40.7 ^a	43.7 ^a	38.6 ^a	27.7 ^a	17.8	18.2	17.5	39.5 ^a	37.8 ^a	40.9 ^a
Honey	32.9	34.1	32.1	24.8	17.6 ^a	25.1 ^a	25.3 ^d	19.3	32.2	34.0	30.8	23.2 ^a	25.7 ^a	21.1 ^a
Lettuce	50.9	51.6	44.8	41.9	51.5	51.3	44.3	33.2	48.4	46.3	50.0	46.7	47.7	45.9
Cooked ham	11.7	10.6	13.3	11.5	6.2 ^c	7.3 ^a	6.9 ^a	6.7 ^c	11.8	12.0	11.6	6.9 ^a	7.6 ^a	6.3 ^a
White fish	33.8	39.0	39.2	30.3	27.1	27.8 ^a	22.3 ^a	18.1 ^c	36.9	34.2	39.0	24.7 ^a	22.8 ^a	26.2 ^a
Pork	3.6	3.0	4.3	6.0	1.0 ^d	1.6 ^b	2.5 ^a	0.4 ^a	3.9	4.4	3.4	1.6 ^a	1.9 ^a	1.4 ^a
Olive oil	16.8	25.3	23.1	17.9	34.3 ^a	47.7 ^a	49.0 ^a	42.9 ^a	21.8	22.2	21.6	45.3 ^a	43.5 ^a	46.8 ^a
Sunflower seed oil	6.3	6.0	7.1	6.0	2.3 ^a	2.4 ^a	4.2 ^a	3.8 ^a	6.9	6.9	5.9	3.2 ^a	3.9 ^a	2.6 ^a
Carrots	57.4	56.3	47.3	38.5	47.4	52.0	43.5	33.6	51.9	50.3	53.2	46.1 ^b	44.4 ^d	47.5 ^d
Rice	19.3	26.5	26.2	20.9	23.1	30.1	25.8	18.5	24.1	26.1	22.5	26.1	26.9	25.4
Lamb	12.4	10.2	11.4	10.7	4.6 ^a	5.7 ^b	6.2 ^a	4.6 ^a	11.1	12.7	9.8	5.6 ^a	6.8 ^a	4.6 ^a
Pasta	15.1	16.8	14.3	11.5	19.9 ^b	23.3 ^a	18.0 ^a	10.5	15.1	17.4	13.2	19.3 ^a	21.1 ^a	17.9 ^a
Butter	1.7	1.6	2.8	2.1	0.3 ^a	0.9 ^a	1.8 ^a	1.3	2.0	1.9	2.1	1.1 ^a	1.1 ^a	1.2 ^a
Corn oil	5.5	5.4	6.9	5.6	1.7 ^a	0.7 ^a	1.6 ^a	2.2 ^a	5.9	5.3	6.3	1.4 ^a	1.5 ^a	1.2 ^a
Veal	21.0	18.5	20.6	15.4	8.5 ^a	9.7 ^a	6.7 ^a	4.6 ^a	19.3	19.2	19.5	7.9 ^a	8.3 ^a	7.5 ^a
White bread	11.9	12.4	17.1	12.4	11.4	10.2	13.8	12.2	13.7	15.9	11.9	11.8	12.8	11.0 ^d
Chickpeas	16.6	20.9	19.8	14.5	23.1 ^b	30.1 ^a	28.5 ^a	21.6 ^a	18.9	19.5	18.3	27.4 ^a	27.1 ^a	27.6 ^a
Eggs	7.3	9.4	6.6	8.1	5.5	5.7 ^b	6.5	4.7 ^c	8.0	8.1	7.8	5.8 ^a	5.5 ^b	6.2 ^d
Potatoes	13.6	14.9	16.0	14.5	10.1	11.6 ^d	14.8 ^b	10.2	14.9	16.6	13.6	12.2 ^c	13.5 ^a	11.1
Wholegrain bread	27.0	29.5	28.0	16.7	22.0	26.7 ^c	28.0 ^b	17.9 ^c	27.0	23.4	30.0	25.2 ^a	23.1 ^a	27.0 ^a
Sugar	6.7	4.8	3.8	2.1	2.0 ^a	3.0 ^d	3.5 ^d	0.8 ^d	4.6	4.8	4.5	2.7 ^a	2.9 ^a	2.6 ^b
Wine	1.9	2.5	2.1	2.6	5.9 ^a	5.9 ^a	8.4 ^a	5.9 ^a	2.3	3.9	1.0	6.7 ^a	9.2 ^a	4.7 ^a
Lard	ne	ne	ne	ne	1.0	0.1	0.3	ne	ne	ne	ne	0.3	0.6	0.1
Milk	ne	ne	ne	ne	31.9	27.1	22.8	11.0	ne	ne	ne	24.5	23.1	25.6

Sample: Population aged 18–75 years.
^a $P < 0.001$, ^b $P < 0.005$, ^c $P < 0.01$, ^d $P < 0.05$, ne – non-evaluated.

Table 3 Distribution of the population (%) that believe that certain foods should be reduced or moderated to prevent high blood cholesterol (ENCAT 1992–93 and ENCAT 2002–03)

	ENCAT 1992–93				ENCAT 2002–03				ENCAT 1992–93			ENCAT 2002–03		
	Age groups (years)				Age groups (years)				Total	Men	Women	Total	Men	Women
	18–24	25–44	45–64	65–75	18–24	25–44	45–64	65–75						
Fruits	5.2	7.9	7.5	6.8	6.2	4.0 ^c	3.7 ^b	7.1	7.1	6.1	7.8	4.7 ^a	4.9	4.5 ^b
Olive oil	48.8	33.0	27.2	26.5	33.0 ^a	19.6 ^a	11.6 ^a	14.6 ^b	34.2	34.7	33.8	18.6 ^a	20.1 ^a	17.3 ^a
Bread	39.4	37.3	41.0	38.0	34.3 ^b	32.7	24.3 ^a	37.1	38.9	35.1	42.0	30.8 ^a	32.9	29.1 ^a
Sausages	82.2	86.9	84.8	74.4	88.9 ^d	93.6 ^a	93.1 ^a	87.5 ^b	83.8	81.3	85.7	91.9 ^a	90.3 ^a	93.2 ^a
Whole milk	ne	ne	ne	ne	65.0	69.5	77.9	68.8	ne	ne	ne	71.4	65.9	75.9
Vegetables	5.7	9.3	8.1	5.6	6.2	2.9 ^a	4.0 ^b	4.2	7.7	7.6	7.8	4.0 ^a	4.0 ^b	4.0 ^a
Butter	80.0	82.0	79.5	70.5	85.3	86.9 ^d	85.3 ^c	78.8 ^d	79.5	76.4	82.1	85.1 ^a	83.2 ^b	86.5 ^d
Cheese	47.5	52.9	56.9	47.9	55.9 ^d	60.7	65.9 ^c	58.6	52.2	49.2	54.7	61.3 ^a	60.8 ^a	61.7 ^b
Eggs	70.4	75.0	73.7	67.1	77.4	81.9 ^c	85.1 ^a	78.3 ^d	72.7	70.5	74.4	81.7 ^a	81.5 ^a	82.0 ^a
Pulses	16.4	19.2	20.8	20.1	9.8 ^d	7.4 ^a	11.5 ^a	15.0 ^d	19.1	17.8	20.1	10.2 ^a	9.7 ^a	10.5 ^a
Skim milk	ne	ne	ne	ne	6.2	6.4	6.7	11.3	ne	ne	ne	7.1	8.1	6.3
Baked goods	72.7	78.4	77.6	67.5	89.9 ^a	90.3 ^a	89.3 ^a	82.5 ^b	75.6	70.1	80.1	88.9 ^a	88.0 ^a	89.6 ^a
Sardines	24.1	26.6	25.1	17.9	19.6 ^d	15.2 ^a	16.1 ^a	21.3	24.6	25.1	24.2	17.0 ^a	19.2 ^a	15.3 ^a
Potatoes	ne	ne	ne	ne	30.2	21.9	21.0	21.7	ne	ne	ne	22.9	23.3	22.7

^a $P < 0.001$, ^b $P < 0.005$, ^c $P < 0.01$, ^d $P < 0.05$, ne – non-evaluated.

population with previously registered blood pressure (91% in 2002–03) exams. The percentage of the sample that had ever been weighed by a nurse or a doctor increased from 63% in 1992–93 to 77% in 2002–03. Most of the population reported weighing themselves at home. Regarding the consumption of diet supplements or vitamins, there was an increase in the proportion of individuals who consumed diet supplements (from 6% to 10%),

especially among females (from 6% to 13% of consumers), and who used iodised salt or salt enriched with iodine and fluoride (from 26% to 40%). A decrease in the consumers of multivitamins (from 10% to 8%) was observed.

Table 5 shows trends for dieting habits and perceptions about excess weight. There was an increase in the percentage of the sample that had followed some kind of diet

Table 4 Distribution (%) of the population according to the interviewer's responses to various questions on preventive practices (ENCAT 1992–93 and ENCAT 2002–03)

	ENCAT 1992–93						ENCAT 2002–03					
	Men		Women		Total		Men		Women		Total	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
<i>Cholesterol</i>												
Have you ever had your cholesterol level checked?												
Yes	430	40.1	559	43.6	989	42.0	586	61.6 ^a	712	64.4 ^a	1298	63.1 ^a
No	574	53.5	660	51.6	1234	52.4	337	35.4	367	33.2	704	34.2
Doesn't know/No comment	69	6.4	62	4.8	131	5.6	29	3.0	26	2.4	55	2.7
<i>Blood pressure</i>												
Have you ever had your blood pressure checked?												
Yes	881	84.8	1117	89.1	1998	87.2	843	88.6 ^c	1022	92.4 ^c	1865	90.6 ^b
No	144	13.9	127	10.1	271	11.8	96	10.1	79	7.1	175	8.5
Doesn't know/No comment	14	1.3	9	0.7	23	1.0	13	1.4	5	0.5	18	0.9
<i>Excess weight</i>												
Have you ever been weighed by a doctor or nurse?												
Yes	640	59.6	842	65.7	1482	63.0	704	73.9 ^a	881	80.2 ^a	1585	77.3 ^a
No	413	38.5	430	33.6	843	35.8	240	25.2	205	18.7	445	21.7
Doesn't know/No comment	20	1.9	9	0.7	29	1.2	9	0.9	12	1.1	21	1.0
Where do you usually weigh yourself?												
Home	509	47.4	661	51.6	1170	49.7	425	45.4 ^a	529	48.1 ^a	954	46.9 ^a
Pharmacy	190	17.7	315	24.6	505	21.5	118	12.6	190	17.3	308	15.1
Private office or public health centre	52	4.8	73	5.7	125	5.3	118	12.6	123	11.2	241	11.8
In other places	92	8.6	49	3.8	141	6.0	72	7.7	59	5.4	131	6.4
I never weigh myself	230	21.4	182	14.2	412	17.5	203	21.7	198	18.0	401	19.7
<i>Consumption of supplements</i>												
Do you take any diet supplements?												
Yes	53	5.0	76	6.0	129	5.5	55	5.8	145	13.2 ^a	200	9.8 ^a
No	1002	95.0	1196	94.0	2198	94.5	892	94.2	956	86.8	1848	90.2
Do you take multivitamins?												
Yes	90	8.5	143	11.3	233	10.0	60	6.9	98	9.5	158	8.3
No	972	91.5	1128	88.7	2100	90.0	814	93.1	930	90.5	1744	91.7
Do you use iodised salt or salt enriched with iodine and fluoride?												
Yes	242	22.9	362	28.6	604	26.0	316	33.1 ^a	508	46.0 ^a	824	40.0 ^a
No/Doesn't know or No comment	813	77.1	903	71.4	1716	74.0	638	66.9	597	54.0	1235	60.0

Sample: Population aged 10–75 years.

^a $P < 0.001$, ^b $P < 0.005$, ^c $P < 0.05$.

within the last 12 months (from 20% to 23%) and in the percentage of the population who were on a diet at the time the survey was conducted, especially among males (from 10% to 15%). There were few changes regarding the reason for being on a diet. Among males, there was an increase in the proportion of individuals dieting for losing weight and for having diabetes. Among females, excess weight was the main reason for dieting and the percentage increased over the period analysed (from 47% to 54%). The proportion of individuals who considered themselves as overweight or obese showed some modifications. Among males, the percentage of individuals who perceived having excess body weight increased (from 26% to 29%), whereas the percentage of females with such perceptions decreased (from 42% to 38%). Among those individuals who reported having excess weight, both males and females felt more concerned about how this excess could affect their health in the ENCAT 2002–03 (14% and 33% of individuals reported being very worried and quite worried about the possible

effects that excess weight could have on their health in 1992–93, with increases to 15% and 39%, respectively, in 2002–03). The proportion of people who believed that doing more exercise was the best method for losing weight increased in the period analysed (from 35% to 43%), and the proportion of people who thought that eating less was the best method for weight loss was high in both surveys, especially among females.

Table 6 shows the tendency for the self-reported prevalence of diabetes among the Catalan population. There was an increase in the prevalence of individuals with diabetes (from 3% to 4% of the population), particularly among males (from 3.4% to 4.5%). A decrease was observed in the proportion of individuals who, being diagnosed with diabetes, were not undergoing some form of treatment (from 14% to 6%), or were treated only with diet (from 42% to 13%) or with diet and oral hypoglycaemic medications (from 22% to 18%). On the other hand, there was an increase in the proportion of diabetic individuals who were treated with insulin (from

Table 5 Distribution (%) of the Catalan population according to dieting habits and perceptions about excess weight (ENCAT 1992–93 and ENCAT 2002–03)

	ENCAT 1992–93						ENCAT 2002–03					
	Men		Women		Total		Men		Women		Total	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
<i>Excess weight</i>												
Do you consider yourself as obese or overweight?												
Yes	279	26.1	535	41.7	814	34.6	277	29.3	417	37.8	694	33.9
No	791	73.9	747	58.3	1538	65.4	668	70.7	686	62.2	1354	66.1
If yes: Are you worried about the possible effects excess weight may have on your health? (1992–93, <i>n</i> = 789) (2002–03, <i>n</i> = 643)												
Yes, a lot	26	9.8	81	15.5	107	13.6	29	11.4 ^b	69	17.7 ^b	98	15.2 ^a
Quite worried	72	27.2	186	35.6	258	32.7	94	36.9	155	39.8	249	38.7
Not much	104	39.2	171	32.7	275	34.9	100	39.2	135	34.7	235	36.5
Not at all	63	23.8	85	16.3	148	18.8	32	12.5	30	7.7	62	9.6
What do you consider the best method for losing weight?												
Eating less	468	44.4	790	62.5	1258	54.3	360	38.1 ^b	561	51.5 ^a	921	45.3 ^a
Not drinking alcohol	48	4.6	27	2.1	75	3.2	23	2.4	12	1.1	35	1.7
Doing more exercise	474	45.0	342	27.1	816	35.2	490	51.9	393	36.1	883	43.4
Taking pills to reduce hunger	2	0.2	10	0.8	12	0.5	2	0.2	3	0.3	5	0.2
Others	62	5.9	95	7.5	157	6.8	70	7.4	120	11.0	190	9.3
How has your weight been throughout your life?												
Stable	912	86.0	1021	80.5	1933	83.0	704	74.3 ^a	746	67.6 ^a	1450	70.7 ^a
Unstable	148	14.0	248	19.5	396	17.0	243	25.7	357	32.4	600	29.3
<i>Dieting</i>												
Have you been on any kind of diet in the last 12 months?												
Yes	161	15.0	298	23.2	459	19.5	170	17.9	294	26.6	464	22.6 ^c
No	913	85.0	984	76.8	1897	80.5	781	82.1	812	73.4	1593	77.4
If yes: Who prescribed the diet? (1992–93, <i>n</i> = 428) (2002–03, <i>n</i> = 444)												
Doctor, Nurse, dietitian, pharmacist	121	79.6	177	64.1	298	69.6	115	71.4 ^c	177	62.5	292	65.8
Friend	3	2.0	9	3.3	12	2.8	1	0.6	7	2.5	8	1.8
Family member	1	0.7	4	1.4	5	1.2	0	0.0	8	2.8	8	1.8
Non-medical professional	9	5.9	18	6.5	27	6.3	6	3.7	16	5.7	22	5.0
Myself, others	18	11.8	68	24.6	86	20.1	39	24.2	75	26.5	114	25.7
Are you currently following a diet? (time interview administered)												
Yes	107	10.1	202	16.0	309	13.3	135	14.6 ^b	202	18.8	337	16.9 ^b
No	951	89.9	1063	84.0	2014	86.7	787	85.4	872	81.2	1659	83.1
If yes: Reason why (1992–93, <i>n</i> = 288) (2002–03, <i>n</i> = 321)												
Diabetes	19	19.4	19	10.0	38	13.2	28	21.9	23	11.9	51	15.9
Hypertension	19	19.4	23	12.1	42	14.6	20	15.6	9	4.7	29	9.0
Excess weight	19	19.4	89	46.8	108	37.5	30	23.4	105	54.4	135	42.1
Cholesterol	10	10.2	27	14.2	37	12.8	17	13.3	27	14.0	44	13.7
Others	31	31.6	32	16.8	63	21.9	33	25.8	29	15.0	62	19.3
If yes: Who prescribed the diet? (1992–93, <i>n</i> = 191) (2002–03, <i>n</i> = 300)												
Public health centre doctor	34	47.9	54	45.0	88	46.1	73	59.8	72	40.4	145	48.3
Private doctor	19	26.8	38	31.7	57	29.8	18	14.8	48	27.0	66	22.0
Hospital	6	8.5	4	3.3	10	5.2	8	6.6	2	1.1	10	3.3
Others	12	16.9	23	20.0	36	18.8	23	18.8	56	31.5	79	26.3

Sample: Population aged 10–75 years.
^a *P* < 0.001, ^b *P* < 0.005, ^c *P* < 0.05.

6% to 10%) and those who were treated with oral hypoglycaemic agents (from 2% to 31%).

Discussion

The difference between what the public is recommended to consume and what they actually eat can be accounted for, in part, by a lack of knowledge of what constitutes ‘healthy eating’ and dietary guidelines. On the other hand, it is becoming more and more evident that further research is needed on the new components outlined below of acquiring habits, which could facilitate the

adoption in individuals and communities of positive health-enhancing food behaviour¹²:

- factors perceived to be the most influential on food choice,
- target population’s knowledge of what constitutes ‘healthy eating’,
- sources of information used by the population and the degree of confidence they have in them,
- perceived benefits and obstacles to attaining healthy eating habits,
- perception of need for modifying food habits,
- stages of change with regard to healthy eating.

Table 6 Self reported prevalence of diabetes in the Catalan population (ENCAT 1992–93 and ENCAT 2002–03)

Diabetes	ENCAT 1992–93						ENCAT 2002–03					
	Men		Women		Total		Men		Women		Total	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Are you diabetic?												
Yes	36	3.4	34	2.7	70	3.0	43	4.5 ^b	38	3.4	81	3.9 ^a
No	1023	95.4	1233	96.3	2256	95.9	907	95.2	1064	96.1	1971	95.7
Doesn't know/No comment	13	1.2	13	1.0	26	1.1	3	0.3	5	0.5	8	0.4
If yes: treated with: (1992–93, <i>n</i> = 65) (2002–03, <i>n</i> = 67)												
Insulin	3	8.3	1	3.4	4	6.2	5	13.5	2	6.7	7	10.4
Diet	16	44.4	11	37.9	27	41.5	4	10.8	5	16.7	9	13.4
OHA	0	0.0	1	3.4	1	1.5	11	29.7	10	33.3	21	31.3
Diet and insulin	3	8.3	4	13.8	7	10.8	6	16.2	7	23.3	13	19.4
Diet and OHA	6	16.7	8	27.6	14	21.5	8	21.6	4	13.3	12	17.9
No treatment being used	5	13.9	4	13.8	9	13.8	2	5.4	2	6.7	4	6.0
Doesn't know or No comment	3	8.3	0	0.0	3	4.6	1	2.7	0	0.0	1	1.5

^a $P < 0.01$, ^b $P < 0.05$.

OHA – oral hypoglycaemic agents.

Furthermore, it is fundamental for the adoption of healthy eating habits, given the diversity of factors that seem to be implicated in dietary change, that health promotion interventions take into account the participation of all sectors involved in achieving such change: consumers, supermarkets, social workers, health professionals, politicians, etc.

The attitudes, values and beliefs of a given population greatly influence what is learned, especially in concepts such as food, which is of utmost importance in the context of day-to-day living. This is widely accepted by various authors. For example, for Dreyfus¹³, the attitudes, beliefs and values that have been developed without taking into account relevant scientific knowledge cannot be influenced in the absence of such information. Yet, this author also recognises that possessing scientific information in and of itself does not ensure the development of more receptive attitudes towards change.

Ryder¹⁴ highlights the importance of attitudes, beliefs and values due to their role in guiding us in diverse and numerous situations in which science and technology are implicated in our lives. For Adams¹⁵, if we do not have the necessary knowledge base, the understanding of any given concept ends up being based not on objective truth but rather on what one believes to be true.

The evaluation of knowledge, attitudes and opinions about healthy eating in the population has been described in the literature mostly in terms of foods, food groups, nutrients (to limit the amount of fat, to eat less sugar, etc.), general terms (good or bad for you, unprocessed, natural) and diet variety¹⁶. The methodology used for gathering information on people's knowledge (for instance, the use of an open or a closed questionnaire) has some impact on the results. For example, in the Catalan Nutrition Survey a closed questionnaire was used, which may have influenced the population's opinion, as they were not able to express in their own words their

beliefs about food and health. For example, fruit was not included in the list of multiple choices. And it is precisely fruit that was not among the healthiest foods cited by the Spanish population in a Pan European Survey that evaluated the definition of healthy eating in the adult population¹⁷. As the authors cited, maybe there is a need to encourage fruit consumption in the Spanish population separating the message from the one of vegetables.

Some vegetables (lettuce and carrots), fish and olive oil were chosen as the healthiest foods in the two Catalan Nutrition Surveys. Fruit and vegetables were also the healthiest foods according to studies in the UK^{16,18}, in Europe¹⁹ and in Finland²⁰. In Catalonia, while in 1992–93 white fish was the type of fish considered most adequate for improving health, in 2002–03 blue fish was the one chosen. Olive oil also increased its rating. The results obtained from the 1992–93 Nutrition Survey in Catalonia served as the basis for developing certain educational activities targeting the general population in collaboration with the Department of Education and the Department of Health of the Catalan Government, which aimed to improve the population's nutritional knowledge and to provide dietary advice²¹. The implementation of such campaigns encouraging the population to increase their knowledge and consumption of Mediterranean foods may have had some impact on the population as seen in the case of olive oil and blue fish, which were perceived as healthier choices in the 2002–03 survey. On the other hand, a pending issue may be to communicate the role that fibre has on health and the importance of increasing their intake, as the Catalan population, as in other Mediterranean countries¹⁷, lacks awareness of this relationship.

There is some controversy in the literature about the population's belief regarding the effect excess meat consumption may have on their health. While some studies showed that as a healthy food meat instead of

fish was the first choice²², in other studies, such as the Pan European Survey, individuals from Mediterranean countries thought that eating less red meat was one of the options for following the healthiest diet. Individuals from central or northern countries in Europe did not share this view²³.

As reported in other studies^{22,24}, no differences were found for food knowledge among males and females or across the age groups. However, there is a need to correct the misconceptions of younger individuals about the effect food has on their health, especially in light of this group's potential to transform into a future chronic disease burden. The fact that this cohort is not able to identify the correct role of certain foods such as bread or potatoes, which form the foundation of the majority of food guides the world over, or olive oil, the key food of the Mediterranean diet, shows that there is still much work to be done.

One of the objectives of the periodic Health Plans for Catalonia^{25–27} was to evaluate the introduction of preventive actions to combat the principal prevalent chronic diseases in the Catalan health care system. Some specific objectives were to evaluate the degree of detection, treatment and follow up that health professionals conducted for certain cardiovascular risk factors such as blood cholesterol levels and glycaemia, body weight and blood pressure. The evaluation of the trends in Catalonia targeting primary prevention of certain risk factors showed an improvement in the degree of preventive actions. Nevertheless, a high percentage of the population reported that they had never checked their serum cholesterol levels or had never been weighed by a health professional. The prevalence of self-reported diabetes has increased, which might be a consequence of an increase in its prevalence or in the preventive actions, with an increase in the number of individuals that had ever checked their glucose levels. What is encouraging is the observed decrease in the number of non-treated diabetic individuals during the period analysed.

Catalan males' self-perception as being overweight or obese has increased and, as such, the feeling that this excess weight may have some negative effect on their health. This awareness is encouraging, keeping in mind that the prevalence of obesity among males has increased in the two Surveys analysed. Females have improved in the perception of their body image, in accordance with the stabilisation of the prevalence of overweight and obesity in this cohort. The International Health and Behaviour Survey showed that 45% of females considered themselves as overweight (and 25% of males). In the same study, 51% of females and 21% of males were dieting to lose weight²⁸. Dieting was more prevalent among women in all the countries that participated in the study. This was also true for the UK, where a population-based survey showed that 21% of males and 36% of females were trying to lose weight²⁹, and in the US³⁰,

where data from the 2001–02 NHANES showed that 34% of males and 48% of females had been trying to lose weight in the previous 12 months. In Catalonia, such differences among sexes were not reported and the prevalence in women was much lower, perhaps due to a sample that included individuals from all age groups. Although there have been some changes in the period analysed, males perceived that exercising was the best method to lose weight while females still relied on eating less as the best weight loss method. In fact, the primary reason for Catalan females to be on a diet was to lose weight, as also reported in studies from Australia³¹ and the US³². Most of the literature shows that when men diet, they use exercise as a tool to increase energy expenditure apart from eating less³³.

The Seven Countries Study³⁴ demonstrated that the traditional Mediterranean diet had been protecting the health of the Mediterranean countries since the early 1960s, even when the population was unaware of its effect on their health. Unfortunately, this dietary pattern has undergone certain modifications and the adherence to such a pattern has decreased in certain Mediterranean countries. In this context, the more the population knows about healthy eating, the better the chances of correcting this trend. The increasing prevalence of overweight and obesity in Spain³⁵ prompted the corresponding authorities to develop the Strategy for Nutrition, Physical Activity and the Prevention of Obesity (NAOS)³⁶, a project targeting the general population that involves multiple stakeholders with the aim of improving the diet and increasing the physical activity habits of the population. The project started in 2005 and is still ongoing. The future evaluations of knowledge, opinions and attitudes of the population will provide further insight into the success of this comprehensive nutrition policy.

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