

Adherence to the Mediterranean dietary pattern among Balearic Islands adolescents

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The aim of the present work was to assess the prevalence of the Mediterranean dietary pattern (MDP) in Balearic Islands adolescents, and socio-demographic and lifestyle factors that might determine adherence to the MDP. A cross-sectional nutritional survey was carried out in the Balearic Islands between 2007 and 2008. A random sample (n 1231) of the adolescent population (12–17 years old) was interviewed. Dietary questionnaires and a general questionnaire incorporating questions related to socio-economic status, parental education level and lifestyle factors were used. Dietary habits were assessed by means of two 24 h recalls and a quantitative FFQ. Adherence to the MDP was defined according to a score constructed considering the consumption of nine MDP characteristic components: high MUFA:SFA ratio, moderate ethanol consumption, high legumes, cereals and roots, fruits, vegetables and fish consumption, and low consumption of meat and milk. Then, socio-demographic, lifestyle and health status variables that could determine a higher or lower adherence were assessed. The mean adherence was 57.9 (SD 8.9) % and the median adherence was 57.3 %. Half of the Balearic Islands adolescents (50.5 %) showed an adherence to the MDP comprised between 52.7 and 62.8 %. By multivariate analyses, a high maternal level of education, increased physical activity, reduced alcohol intake and abstinence from smoking were independent associations of better adherence to the MDP. The promotion of not only the MDP but also the Mediterranean lifestyle, including greater physical activity, should be reinforced among the Balearic younger generations.

Nutrition surveys: Mediterranean dietary pattern: Balearic Islands: Mediterranean region: Adolescents

Adolescence is a time of rapid physiological, psychological and social development influencing nutrient needs and an individual's ability to supply those needs. Sociocultural factors, i.e. parental occupational status, maternal level of education, cultural and/or religious habits, the role of family, patterns of beauty, etc., are factors that have a strong influence on eating habits in this age group and, hence, their nutrient intake⁽¹⁾. Therefore, in light of the high nutritional needs during adolescence, findings that increase knowledge about these factors could influence the development of healthy eating patterns that may continue into adulthood and decrease inadequate dietary intakes reported by many adolescents.

The traditional Mediterranean dietary pattern (MDP) is characterised by a high intake of vegetables, legumes, fruits and nuts, and cereals (which in the past were largely unrefined), a high intake of olive oil but a low intake of saturated lipids, a moderately high intake of fish (depending on the proximity of the sea), a low-to-moderate intake of dairy products (and then mostly in the form of cheese or yoghurt), a low intake of meat and poultry and a regular but moderate intake of ethanol, primarily in the form of wine and generally during meals⁽²⁾. The traditional MDP has been associated with a reduced risk of several non-transmittable

chronic diseases and with prolonged survival; hence, the MDP has been promoted as a model for healthy eating^(3–5).

Epidemiological evidence suggests that dietary patterns in the Mediterranean countries are changing rapidly, with an increased consumption of animal products and saturated fat and a decline of intake of basic foodstuffs based on vegetables⁽⁶⁾. Reasons for this development can be found in the substantial socio-economic changes throughout all of Europe over the past 40 years. All the recent nutritional surveys carried out in Spain in different groups of the population confirm a progressive departure from the traditional Mediterranean diet, mainly in younger generations^(7–11). The most important food sources of Spanish children aged 6–7 years were white bread (13.4 % of carbohydrate), olive oil (13.8 % of lipids), whole milk (10.2 % of protein) and French fries (30.4 % of PUFA)⁽¹²⁾. All these changes observed in the Mediterranean diet involve deterioration not only of the macronutrient but also the micronutrient content of the Mediterranean diet and therefore its benefits on health⁽¹³⁾.

The food pattern of the adult population of the Balearic Islands is in a transitional state characterised by the loss of the traditional MDP towards a more Western dietary pattern, with increased consumption of animal products

Abbreviations: MDP, Mediterranean dietary pattern; PAL, physical activity level.

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and saturated fat and detriment of basic foodstuffs on a vegetable basis^(12,14).

In spite of several epidemiological studies that have evaluated the adherence of a population to the MDP⁽¹⁵⁾, to our knowledge, few approaches have tested the adherence to the Mediterranean diet among young populations, mainly in Spanish, Greek and Cypriot youngsters. In 1998–2000, only 46.4% of Spanish children and young people (2–24 years) had an optimal Mediterranean diet⁽¹⁶⁾. In 2007, only 11.3% of Greek children and 8.3% of adolescents reported eating habits following the traditional MDP⁽¹⁷⁾. In 2004, Spanish adolescents (12–17 years) of Guadalajara (Spain) showed 42.8% of mean adherence to the MDP⁽¹⁸⁾. In 2004–2005, 6.7% of Cypriot pre-adolescents reported high adherence to the MDP⁽¹⁹⁾.

The aim of the present study was to assess the prevalence of the MDP in the Balearic Islands adolescents, and socio-demographic and lifestyle factors that might determine adherence to the MDP.

Methods

Study design

The study is a population-based cross-sectional nutritional survey carried out in the Balearic Islands between 2007 and 2008.

Selection of participants, recruitment and approval

The target population consisted of all inhabitants living in the Balearic Islands aged 12–17 years. The sample population was derived from residents aged 12–17 years registered in the scholar census of the Balearic Islands. The theoretical sample size was set at 1500 individuals in order to provide a specific relative precision of 5% (type I error = 0.05; type II error = 0.10), taking into account an anticipated 70% participation rate. The sampling technique included stratification according to municipality size, age and sex of inhabitants, and randomisation into subgroups, with Balearic Islands municipalities being the primary sampling units, and individuals within the schools of these municipalities comprising the final sample units. The interviews were performed at the schools. The final sample size was 1231 individuals (82% participation). The reasons to not participate were: (1) the subject declined to be interviewed; (2) the parents did not authorise the interview.

General questionnaire

A questionnaire incorporating the following questions was used: age group; region of origin (defined as being born in the Balearic Islands, East of Spain as representative of the Spanish Mediterranean coast, other parts of Spain and other countries); father's and mother's educational level (grouped according to years and type of education: low, <6 years at school; medium, 6–12 years of education; high, >12 years of education); parental socio-economic level (based on the occupation of parents and classified as low, medium and high, according to the methodology described by the Spanish

Society of Epidemiology⁽²⁰⁾). Anthropometric measurements were also obtained.

Physical activity was evaluating according to the guidelines for data processing and analysis of the international physical activity questionnaire⁽²¹⁾ in the short form, and its specific modification for adolescents (International Physical Activity Questionnaire A)⁽²²⁾. The specific types of activity assessed were walking, moderate-intensity activities (i.e. physical activity at school) and vigorous-intensity activities (i.e. sport practice), and an additional question about sitting time was using as an indicator variable of time spent in sedentary activity. According to the AVENA (Alimentación y Valoración del Estado Nutricional en Adolescentes; Food and Assessment of Nutritional Status of Adolescents) study⁽²³⁾, the questionnaire also included information on hours per day of television viewing, computer use, video games, another leisure time physical activity practice and typical sleep duration to the nearest 10 min. The physical activity assessed by the international physical activity questionnaire was correlated with physical activity level (PAL) according to the estimation of the individualised activity coefficient. Each subject was classified taking into account its PAL value⁽²⁴⁾ as sedentary (PAL $\geq 1.0 < 1.4$); low active (PAL $\geq 1.4 < 1.6$); active (PAL $\geq 1.6 < 1.9$); very active (PAL ≥ 1.9). Each subject was then classified into no active (sedentary or low active) and active (active or very active).

Information about smoking habits and alcohol consumption was collected as described: smoking habit (no; yes; occasionally, <1 cigarette/d); alcohol consumption (no; frequently; occasionally, <1 drink/week).

Dietary questionnaire

Dietary questionnaires included two non-consecutive 24 h diet recalls and a semi-quantitative FFQ previously used in a pilot study on Balearic Islands adolescents⁽¹⁾. The FFQ was previously validated⁽²⁵⁾ and applied to other studies and surveys over the Spanish population^(11,14,26,27). The FFQ, which asked the subject to recall average use over the past year, consisted of 145 items (118 of the original validated FFQ plus the most characteristic Balearic Islands foods in order to make easy the interviewee answer), and arranged by food type and meal pattern. Frequency of food consumption was based on times that food items were consumed (per day, week or month). Consumption <1/month was considered no consumption. Daily consumption (g) was determined by dividing the reported amount of the intake by the frequency (d). The period of consumption of seasonal items was also considered. Edible fractions of foods were recorded in the database^(25–27).

To avoid bias brought on by day-to-day intake variability, the questionnaires were administered homogeneously from Monday to Sunday. Well-trained dietitians administered the recalls and verified and quantified the food records. To estimate volumes and portion sizes, the household measures found in the subjects' own homes were used. Conversion of food into nutrients was made using a self-made computerised program based on Spanish^(28,29) and European⁽³⁰⁾ food composition tables and complemented with food composition data available for Majorcan food

items⁽³¹⁾. Identification of misreporters: an energy intake:BMR ratio <0.92 (men) and <0.85 (women) was considered to represent underreporting⁽³²⁾, and an energy intake:BMR ratio ≥ 2.4 as overreporting^(33,34).

Mediterranean dietary pattern

The MDP has been defined according to a previously defined score indicating the degree of adherence to the traditional Mediterranean diet^(2,11,35). This Mediterranean dietary score was converted to relative percentage of adherence using a previously described method⁽⁹⁾ that will now be briefly summarised.

An energy-adjusted value was obtained for each individual for the daily consumption of legumes, cereals and roots (including bread and potatoes), fruit (including nuts), vegetables, fish, meat (and meat products) and whole milk (and whole milk products). The alcohol consumption in adolescents must be null, and values above the reference indicate a consumption alcohol on the part of adolescents. Information about the consumption of all the food items was obtained from the FFQ.

All the values were standardised as a Z value. A Z score expresses the difference between the individual's measurement and the mean value of the reference population (in this case, the study population) as a proportion of the SD of the reference population (observed intake - mean intake/SD). The total Mediterranean dietary score was computed by adding up all the Z scores obtained for the favourable or 'more Mediterranean' dietary components (legumes, cereals and roots, fruit, vegetables, fish and MUFA:SFA ratio) and subtracting the Z value obtained from the consumption of meat, whole milk (mainly high in fat) and alcohol (in adolescents):

$$\begin{aligned} \Sigma Z_i = & Z_{\text{legumes}} + Z_{\text{cereals and roots}} + Z_{\text{fruit}} + Z_{\text{vegetables}} + Z_{\text{fish}} \\ & + Z_{\text{MUFA:SFA}} - Z_{\text{meat}} - Z_{\text{whole milk}} - Z_{\text{alcohol}}. \end{aligned}$$

The Mediterranean dietary score was converted to relative percentage of adherence using the range of values of

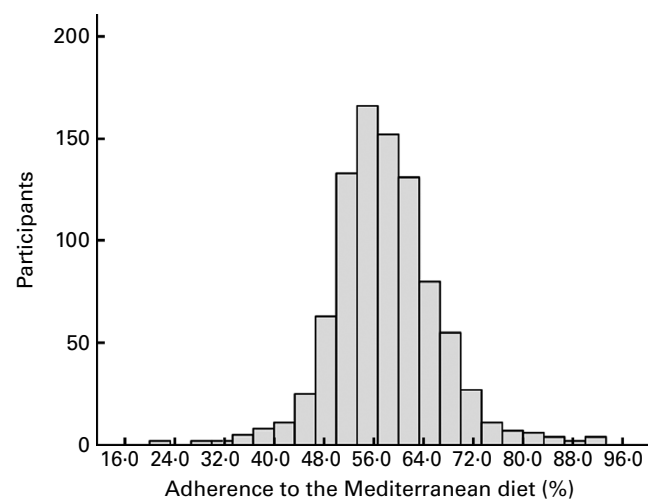


Fig. 1. Distribution of percentage of adherence to the Mediterranean dietary pattern among the Balearic Islands adolescents.

the sample. This percentage ranged from 100 (maximum adherence) to 0 (minimum adherence):

$$\text{Adherence (percentage)}_i = (\Sigma Z_i - \Sigma Z_{\text{min}}) \times 100 / (\Sigma Z_{\text{max}} - \Sigma Z_{\text{min}}).$$

Once the percentage of adherence to the MDP was calculated, the variables that could determine a higher or lower adherence were assessed.

Statistics

Analyses were performed with Statistical Package for the Social Sciences version 16.0. All tests were stratified by sex. Mean adherence and SD were calculated. Quartile values of adherence to the Mediterranean diet were calculated in order to find the group of the population with the lowest adherence percentage (percentage below the lower quartile value) and those with the highest adherence (percentage of adherence above the upper quartile value). To further study the socio-demographic and lifestyle differences between those with the lowest and highest adherence (in order to assess which variables better determined a high or low adherence), logistic regression models were used with the calculations of corresponding age- and sex-adjusted OR and 95% CI. The level of significance was established for P values <0.05.

Ethics

The present study was conducted according to the guidelines laid down in the Declaration of Helsinki, and all procedures involving human subjects were approved by the Balearic Islands Ethics Committee. Written informed consent was obtained from all subjects and their parents or legal tutors.

Results

A total of 1231 individuals formed part of the present study. Underreporters (n 246) and overreporters (n 24) were excluded from the analysis of dietary patterns in order to avoid respondent bias usually present in recall dietary methods.

Fig. 1 shows that the distribution of percentage of adherence to the MDP roughly follows a normal distribution with a little SD. The mean adherence was 57.9 (SD 8.9)% and the median adherence was 57.3%. The lowest adherence to the MDP was defined as percentage of adherence below the lower quartile (52.7%), and the highest adherence was defined as percentage of adherence above the upper quartile (62.8%).

Means and standard deviations of the percentage of adherence to the MDP according to socio-demographic and lifestyle factors are shown in Table 1, together with age- and sex-adjusted OR for a low adherence, to find the factors with high risk of low adherence to the MDP.

Girls' percentage of adherence to the MDP was greater than boys' (58.7 and 56.9%, respectively), and this difference was statistically significant after adjusting for age. An inverse association can be observed between age and the risk of low adherence to the MDP, although this difference is not statistically significant. The trend of decreasing adherence to the MDP with age happened in boys, whereas in girls the

Table 1. Percentage of adherence and risk of a low adherence according to socio-demographic and lifestyle variables (Mean values and standard deviations; OR and 95 % CI)

Socio-demographic and lifestyle variables	Percentage of adherence		Risk of low adherence*		
	Mean	SD	Age- and sex-adjusted OR	95 % CI	P value
Sex					
Male	56.9	8.9	1.67	1.18, 2.36	0.004
Female	58.7	8.8	1.00 (ref.)		
Age group (years)					
12–13	58.5	9.3	0.83	0.50, 1.38	0.477
14–15	58.1	8.3	0.88	0.59, 1.31	0.527
16–17	57.0	9.6	1.00 (ref.)		
Place of birth					
Mediterranean Spanish regions	59.9	11.6	0.87	0.32, 2.36	0.787
Other Spanish regions	57.9	7.1	0.65	0.29, 1.49	0.313
Other Mediterranean countries	58.9	9.4	0.42	0.09, 2.01	0.280
Other countries	57.9	8.0	0.81	0.47, 1.39	0.439
Balearic Islands	57.8	9.0	1.00 (ref.)		
Educational level†					
Father					
Low	57.0	8.7	0.77	0.43, 1.37	0.378
Medium	57.9	8.4	0.94	0.59, 1.50	0.802
High	59.1	9.7	1.00 (ref.)		
Mother					
Low	56.3	8.1	1.86	1.02, 3.39	0.042
Medium	58.2	8.7	1.09	0.67, 1.75	0.736
High	59.1	9.4	1.00 (ref.)		
Parental socio-economic status‡					
Low	57.2	8.9	1.19	0.66, 2.14	0.570
Medium	58.2	9.1	0.93	0.57, 1.51	0.765
High	58.4	8.6	1.00 (ref.)		
PAL§					
Sedentary	57.2	9.6	2.66	0.92, 7.68	0.072
Low active	57.6	7.9	2.27	1.07, 4.81	0.033
Active	58.1	9.9	1.88	0.91, 3.92	0.090
Very active	58.5	7.1	1.00 (ref.)		
Smoking habit					
Yes	53.3	11.3	2.24	1.09, 4.59	0.028
No	58.4	8.4	1.07	0.74, 1.54	0.733
Occasionally	58.0	8.8	1.00 (ref.)		
Alcohol consumption¶					
No	58.6	8.2	0.53	0.35, 0.80	0.002
Yes	55.3	10.7	1.00 (ref.)		

ref., Reference; PAL, physical activity level.

* Multiple logistic regression analysis adjusting for age and sex. Low adherence was defined as a percentage of adherence below the lower quartile (52.7%); high adherence was defined as a percentage of adherence above the upper quartile (62.8%).

† Educational status is grouped according to years and type of education: low (<6 years of education); medium (6–12 years of education); high (>12 years of education).

‡ Socio-economic level is based on the occupation of parents.

§ PAL was determined according to the level of exercise reported by the interviewee during their free time and classified as sedentary (PAL < 1.4); low active (1.4 ≤ PAL < 1.6); active (1.6 ≤ PAL < 1.9); very active (PAL ≥ 1.9).

|| Smoking habit was classified as no (never); yes (>1 cigarette/d); occasionally (<1 cigarette/d).

¶ Alcohol consumption was classified as no (no glass of alcohol); yes (one or more glass of alcohol per day).

percentages of adherence were similar between groups of age (data not shown). Just 7.1 % of the Balearic Islands adolescents showed optimal MDP.

Adolescents with high educational level of parents showed more adherence to the MDP than those with medium and low educational levels. The risk of low adherence in adolescents with low educational level mothers was approximately two times higher than the others. The paternal educational level did not influence the adolescent adherence to the MDP. The parental socio-economic status was not significantly linked to greater or lower adherence to the MDP. Frequent smokers showed the lowest adherence to the MDP and double risk of low adherence to the MDP than occasional

and non-smoker adolescents. Non-alcohol drinker adolescents showed higher adherence to the MDP and lower risk of low adherence to the MDP than drinkers. Sedentary and low-active adolescents showed lower adherence to the MDP and lower risk of low adherence to the MDP than active and very active adolescents. There were no differences among adolescents' place of birth.

The distribution of the consumption (g/d or ml/d) of the Mediterranean diet components according to low and high adherence to the Mediterranean diet is shown in Table 2. Youngsters with high adherence to the MDP showed higher consumption of more Mediterranean dietary components (cereals and roots, vegetables, fruit, legumes, fish and

Table 2. Distribution of the consumption (g/d or ml/d) of the Mediterranean diet (MD) components according to low and high adherence to the MD (Mean values and standard deviations)

	Low adherence to the MD* (n 543)		High adherence to the MD† (n 67)		P value
	Mean	SD	Mean	SD	
Cereals and roots	463.7	308.4	1005.8	919.8	0.001
Vegetables	86.6	81.3	328.9	294.5	0.001
Fruit	132.5	115.0	361.8	289.4	0.001
Legumes	16.3	17.6	66.2	101.1	0.001
Fish	17.6	15.3	73.3	90.9	0.001
Meat	235.6	197.3	230.1	209.8	0.001
Whole milk (and products)	543.6	399.6	487.0	265.6	0.003
MUFA:SFA	1.2	0.3	1.8	0.6	0.001
Alcohol	5.5	2.4	0.8	2.9	0.016

* Lower quartile (<52.5% adherence to the MD).

† Upper quartile (≥62.8% adherence to the MD).

MUFA:SFA ratio) and smaller consumption of meat, whole milk (and products) and alcohol than adolescents with low adherence to the MDP.

Discussion

In nutritional epidemiology, analyses of individual nutrients and food can ignore important interactions between components of a diet. Moreover, people do not eat isolated nutrients, and then it is always interesting to study the dietary patterns of a population. It is also well known that the Mediterranean diet is an interesting alternative in health promotion because this pattern, and not only its individual nutrients, has been postulated as being protective against several diseases^(2,4,9,10). However, despite all the increasing evidence about the benefits of the Mediterranean diet, nowadays we are witnessing the detriment of this diet in many Mediterranean regions towards a more Western-type diet⁽³⁶⁾. Therefore, it is interesting to assess the adherence of Mediterranean population to the MDP.

Moreover, studies examining adherence to the MDP among young Mediterranean people are scarce^(16–19). So, this is the first time that the adherence to the MDP is assessed in a representative sample of adolescents of the Balearic Islands, a typically Mediterranean region, and contributes to the knowledge on the adherence of Mediterranean adolescents to the MDP.

The adherence to the MDP among adolescents was measured according to a Mediterranean dietary score, computed taking into account the most characteristic component of this dietary pattern⁽⁹⁾. The average adherence of adolescents to the MDP was 57.9 (SD 8.9)%. The observed SD indicates that the percentage of adherence to the Mediterranean diet is fairly uniform, with low variability across all the study participants. The mean adherence to the MDP showed by Balearic Islands adolescents is higher than that observed in other Spanish adolescents⁽¹⁸⁾, but the percentage of Balearic Islands adolescents that showed optimal MDP is quite similar to other Mediterranean populations^(17,19).

It is well known that a high adherence to the MDP means a better diet quality^(3–5), and this have been also demonstrated in the present study, since highest consumptions of more Mediterranean dietary components and smallest consumptions of meat, whole milk (and products) and alcohol have been observed in Balearic Islands adolescents with highest adherence to the MDP.

Girls showed higher adherence and lower risk of having low adherence to the MDP than boys. These results agree with a previous study that pointed out that girls were more likely to pay attention to food as a way to influence health and to meet nutritional recommendations than boys⁽³⁷⁾. It cannot be discarded, however, that girls underreported their sweets and snacks consumption.

The family educational level has a marked effect on family lifestyles and dietary habits⁽³⁸⁾. In agreement with these previous studies, mother's educational level was also a stronger factor on the dietary habits of youngsters than father's educational level. Accordingly, there was a direct association between adherence to the MDP and the mother's educational level, whereas no effect of father's educational level on the adolescent's adherence to the MDP was observed. Nowadays, the mother is still responsible for the home food in the Balearic Islands, and the mother's educational level is one of the best predictors of the quality of an adolescent's diet. The present results are also in agreement with previous studies carried out in Spanish adults^(6–8,10,11,39) that suggested a direct association between low educational level and low consumption of fruits and vegetables, which are characteristic foods of the MDP.

The adoption of alcohol, tobacco and other drug use and misuse typically begins during adolescence and may mean serious health problems in adulthood. In the present study, non-alcohol drinker adolescents showed higher adherence to the MDP and lower risk of low adherence to the MDP than drinkers. Alcohol consumption is a method with which adolescents can enhance social relationships in which they spend much time⁽⁴⁰⁾. The Balearic Islands adolescents consumed alcohol, mainly distilled spirits, on weekends (data not shown), which is closer to Scandinavian patterns⁽⁴¹⁾ than to Mediterranean patterns⁽⁴²⁾. These studies support our

conclusion that alcohol consumption is a negative factor on the adherence of adolescents to the MDP. Moreover, the traditional alcohol consumption in the MDP is primarily in the form of wine and generally during meals⁽²⁾, which is quite far from the adolescent pattern of alcohol consumption.

Frequent smokers showed the lowest adherence to the MDP and double the risk of low adherence to the MDP than occasional and non-smoker adolescents. It has been documented that smoking is linked to less healthy dietary habits^(43,44). Moreover, a previous study carried out in adult Spanish populations pointed out that smoking was inversely associated with higher adherence to the traditional MDP⁽⁴⁵⁾. These previous works reinforce our conclusion that smoking habit is a negative factor on the adherence of adolescents to the MDP.

Sedentary and low-active adolescents showed lower adherence to the MDP and lower risk of low adherence to the MDP than active and very active adolescents. This association has also been observed in previous studies^(6,10,46–49). Healthy lifestyle variables tend to cluster and therefore we could speak about the Mediterranean lifestyle, including a higher level of physical activity, as one aspect associated with the MDP that can be protective against different diseases.

Limitations of the study

The methodology of the present study has some limitations, as, for example, the 24 h recalls provide information on food intake, and because the data collection occurs after consumption, this method does not affect an individual's food choices on a given day⁽⁵⁰⁾. At least two non-consecutive administrations are necessary to assess usual intakes, to reduce dependency on intake from the previous day and by household food availability⁽⁵⁰⁾. Accordingly, we applied two 24 h non-consecutive recalls in the present study.

Although 24 h recalls collect data soon after intake, recalls also have limitations related to memory and bias⁽⁵⁰⁾. Many adolescents have difficulties in estimating their consumption of some foods, and the consequence of difficulties in assessing high-energy-dense foods may be that consumed amounts are underestimated, which in turn may have a great effect on the validity of the reported energy intake⁽⁵¹⁾. Underreporting and overreporting are significant contributors to the systematic bias of self-reported dietary assessments, increasing or decreasing estimates of the incidence of inadequate intake, and distorting the relationships between nutrient intake and health. Therefore, there are real shortcomings in dietary studies.

To solve these shortcomings, it has been pointed out⁽⁵²⁾ that dietary studies should include an internal validation procedure. Biomarkers of energy intake have been suggested to play a useful role in dietary assessment, especially for components of foods that are highly variable within different samples of the same food. However, biomarkers, even when available, also have many limitations⁽⁵³⁾. Advantages and limitations of each must be carefully considered in any specific application, but the mainstay of nutritional epidemiology will remain assessments of dietary intake.

Physical activity is a complex multidimensional exposure, which is difficult to measure by self-reported questionnaires

in epidemiological studies⁽⁵⁴⁾. Self-report of physical activity can lead to overreporting of the physical activity due to a social desirability bias, and therefore the number of inactive individuals may be greater than that reported^(55,56), especially among children and adolescents, and also among the obese⁽⁵⁵⁾. Questionnaires have inherent limitations, mainly because they are subjective in nature. Limitations in the validity of physical activity questionnaires are considered the main reasons for inaccuracies in epidemiological studies.

An extensive range of instruments for measuring physical activity has been reported in the literature, but critical elements in the utility of an instrument to measure physical activity are that it will be relatively inexpensive, cause minimal inconvenience to the participant and be able to be administered with relative ease⁽⁵⁷⁾.

Conclusions

Current adolescents in the the Balearic Islands show 57.9 % of mean adherence to the MDP, but 7.1 % of them show optimal MDP. High maternal level of education and physical activity, as well as poor alcohol consumption and smoking habit are promoting factors of adherence of adolescents to the MDP, and hence to the quality of their diet. The promotion of not only the MDP but also the Mediterranean lifestyle, including greater physical activity, should be reinforced among the Balearic younger generations.

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