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Need of improvement of diet and life habits among university student regardless of religion professed

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ABSTRACT

At present, few studies have assessed the possible influence of culture and religion on healthy eating habits among the university population. The aim of this study was to identify differences in healthy and eating habits among university students of different religions. A cross-sectional study was performed with a sample population of 257 students (22.4 ± 4.76 y) at the campus of the University of Granada in Melilla (Spain). The quality of diet was assessed by the Healthy Eating Index (HEI) and the adherence to the Mediterranean diet by a validated score (MDS). There were a higher prevalence of overweight in Christian boys and girls compared to Muslims. Muslim students omit breakfast and dinner more often than Christians. Significant differences in sodium intake ($p < 0.001$) were observed among boys of Christian and Muslim faith, with significantly higher intakes in Christians. In contrast, a higher cholesterol intake ($p = 0.038$) was observed in Muslim girls compared to Christians. Regarding alcohol intake, its consumption being much higher among students of Christian faith. Likewise, there were no significant differences in the quality of the diet as assessed by HEI, this being of poor, together with a low adherence to the Mediterranean diet in both groups. Muslim university students have a lower risk of drinking alcohol (OR = 7.88, 95% CI = 4.27, 14.54). Few differences were found between girls and boys in both religions although the Mediterranean Diet Score was lower for girls. In conclusion, Melilla university students eat low quality foods and have little adherence to the Mediterranean diet regardless of the religion professed or gender, although Christians tend to drink more alcohol and to smoke more cigarettes and Muslims skip some meals.

1. Introduction

There is increasing literature suggesting that the university students may be a population at biological and social risk, often with inadequate health behaviors and life habits (Azadbakht & Esmaillzadeh, 2012; Senekal, Lasker, Van Velden, Laubscher, & Temple, 2016; Turhan et al., 2016). In addition, studies on the university population indicate that these individuals are distancing from the traditional Mediterranean food pattern (García and Martínez-Monzó, 2002; Durá & Castroviejo, 2011). This diet is characterized by a high consumption of fruits, vegetables, and olive oil, as well as a reduced consumption of meat and dairy projects. Accordingly, the Mediterranean diet has low levels of saturated fatty acids, and high levels of monounsaturated fatty acids, complex carbohydrates, and fiber. Due to its particular features, this dietary pattern is closely linked to a lower risk of chronic illnesses such as type 2 diabetes mellitus, cardiovascular disease (Serra-Majem, Roman, & Estruch, 2006), and overall a longer life span (Estruch et al., 2013).

New responsibilities such as buying food, choosing a daily menu, and preparing meals are factors that could contribute to conditioning their eating habits (Rakicioglu & Yildiz, 2011). Furthermore, recent studies point out to a rapid adoption of risky nutritional practices, such as rapid weight loss diets, irregular

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meals, skipping breakfast, consumption of nutrient-poor food and the excessive intake of alcohol (Cortés, Giménez, Motos, & Cadaveira, 2014) as well as other toxic substances (Patiño-Masó, Gras-Pérez, Font-Mayolas, & Baltasar-Bagué, 2013). This can lead to deficiencies in micronutrients and in other essential components found in the traditional Mediterranean diet, which are indispensable to achieve an adequate nutritional health (Baldini, Pasqui, Bordoni, & Maranesi, 2009; Estruch et al., 2013; Santomauro et al., 2014; Trichopoulou et al., 2014).

It has been reported that religion can act as a protective factor among the university population against health and nutritional behaviors and habits, (Ruiz, González, Vera, & Azancot, 2011). Studies such as the published by Van der Meer Sanchez, De Oliveira, Nappo (2008) and Gomes, de Andrade, Izbicki, Moreira Almeida, and Oliveira (2013), in a Brazilian university population, suggest that culture and religion can positively influence the adoption of healthy living habits and act as a protective factor against drug use in this group. Similar results have been described in other countries with a university population of different religious denominations (El Ansari, Sebena, & Stock, 2014; Neighbors, Brown, Dibello, Rodriguez, & Foster, 2013); However, it has not been shown whether religion is associated with healthy or unhealthy eating habits (Tanton, Dodd, Woodfield, & Mabhala, 2015). In this regard, Melilla, a Spanish university city located in North Africa with a large Christian and Muslim university population, represents the ideal setting for assessing whether or not this cultural and religious plurality is advantageous over the lifestyles and nutritional habits of university students (Navarro-Prado, González-Jiménez, Montero-Alonso, López-Bueno, & Schmidt-RioValle, 2015). Therefore, the aims of this study were to characterize the eating habits and healthy habits of students at the Melilla campus of the University of Granada, to evaluate the quality of their diet and to assess their level of adherence to the Mediterranean diet, as well as to determine the influence of religion in the practice of healthy living habits.

2. Material and methods

2.1. Study design and sampling

A cross-sectional study was performed during the 2013–2014 academic year. It monitored the life style and eating habits of a group of students from the campus of the University of Granada in the Spanish city of Melilla on the North African coast, a city with an large university population of Christina and Muslim confessions. The sample consisted of 257 students, 141 Christian and 116 Muslim, 22.4 ± 4.76 years of age, selected by random sampling among the total university population of the Melilla campus (n = 1188 students).

2.2. Data collection

To participate in the study it was necessary to be enrolled in one of the Degree studies offered by one of the three Faculties of the Melilla campus. Another criterion for inclusion was the acceptance and written signature of informed consent. The exclusion criteria considered were the existence of endocrine and metabolic pathologies and the refusal to participate in the study. The flow diagram (Fig. 1) summarizes the process of selecting participants.

In September 2013 a series of meetings were scheduled, which were attended by all of the students on the campus. Attending students were informed about the different evaluations that should be done, as well as the questionnaires that they had to complete, if they finally decided to participate in the study. The complete evaluation of the subjects participants took place in October 2013. This included an anthropometric assessment and analysis of body composition. In addition, two instruments were used, a questionnaire focused on the subject's life style and eating habits and a 72-h food record.

The study was approved by Consejería de Educación y Juventud del Gobierno de Melilla. All participants gave written, informed consent and data were coded to ensure confidentiality. This research was performed in strict compliance with the international code of medical ethics established by the World Medical Association and the Declaration of Helsinki.

2.3. Anthropometric evaluation and body composition analysis

Anthropometric variables were measured in accordance with the International Society for the Advancement of Kinanthropometry guidelines (Marfell-Jones, Olds, & Stewart, 2006). Variables were collected at the same time in the morning, between 7:00 and 10:00 a.m., following an overnight fast. Body weight was measured in the subjects' underwear and with no shoes, using electronic scales (Tanita BC-418MA®, Hamburg, Germany) with a low technical error of measurement (TEM = 0.510%). Height was measured using a mechanical stadiometer platform (Seca® 274, Hamburg, Germany; TEM = 0.01%). The BMI (kg/m^2) categorization of the subjects was performed according to the categories established by the World Health Organization (WHO, 1998). The calculation of body composition was performed with a Body Composition Analyser (Tanita BC-418MA®, Hamburg, Germany). The same trained research assistant performed all the measurements.

2.4. General data and food consumption assessment

All of the participants were asked to fill out a questionnaire that focused on their life style and eating habits. This instrument was an adapted version of a questionnaire (demographic data, eating habits, and food consumption) that was elaborated and previously validated by González et al. (2012).

Furthermore, the subjects were asked to fill out a 72-h food record (i.e. Thursday, Friday, and Saturday). The nutritional information was analyzed with the nutritional computer application, Diet Source® version 3.0.

The degree of the subjects' adherence to the Mediterranean diet was evaluated with the Mediterranean Diet Score (MDS), created and subsequently modified by Trichopoulou, Costacou, Bamia, and Trichopoulos (2003). It focuses on the core components of the Mediterranean diet, which can be assigned a value of 0 or 1. These components are summarized in nine variables: (i) vegetables and potatoes; (ii) legumes; (iii) fruits; (iv) cereals and their by-products; (v) fish; (vi) meat; (vii) dairy products; (viii) alcohol; (ix) the ratio of monounsaturated fatty acids to saturated fatty acids (MUFAs/SFAs).

The median of the values specific of each sex was used as a cut-off point for each food group. When the consumption of food groups in the Mediterranean diet and the MUFAs/SFAs ratio were lower than the median of the sample, the score was 0. In contrast, if consumption was higher than the median, the score was 1. Furthermore, foods not characteristic of the Mediterranean diet (i.e. meat and dairy products) had a score of 0 when they were consumed over the median, and 1 when their consumption was lower than the median. Alcohol had a score of 1 when it was consumed in quantities of 10–50 g/day for male subjects and 5–25 g/day for female subjects. Other values had a score of 0. Therefore, the values of this index ranged from 0 to 9 points. Scores of 4 or more were associated with a satisfactory adherence to the Mediterranean diet whereas scores lower than 4 reflected an