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Adherence to the Mediterranean diet by nursing students of Murcia (Spain)

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Abstract

Introduction: The Mediterranean diet is recognized as one with the healthiest dietary patterns; however, this diet is deteriorating and being abandoned even in the Mediterranean countries themselves. Generally speaking, dietary habits get fixed during adolescence although during the college phase, students may experience important changes in their lifestyles. The KIDMED index is recognized as a good tool to assess adherence to the Mediterranean diet (AMD).

Objective: The aim of this study was to assess AMD in college students and to evidence possible variations throughout the college period assessing differences between the college years.

Method: A cross-sectional study with 213 alumni in first grade and 105 in fourth grade was carried out. The students were classified by gender, type of residence (parents' home or out of the parents' house) and body mass index (BMI) (< 25 or > 25).

Results: The BMI for the whole sample was 24.35 ± 2.71 in men and 22.54 ± 3.25 in women (p < 0.001). The mean score in AMD was 7.0 ± 1.9, with 43% of the students showing good adherence. In general, a low intake of fruits, vegetables, rice or pasta was observed, foods that are included in the base of the dietary pyramid. Consumption of olive oil and legumes was very high and a direct relationship was observed between overweighed people (BMI > 25) and the habit of not having breakfast usually. No significant differences were observed between the student of first and fourth grades although those students in the fourth grade living away from the parental house had higher AMD level than the other students (p < 0.001).

Conclusions: Educational programs promoting the intake of the different groups of food are recommended, was well as strategies promoting the consumption of fruits and vegetables within the university area and the healthy habit of having breakfast.

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Key words: *Mediterranean diet. Nursing. College students. Nutrition.*

ADHERENCIA A LA DIETA MEDITERRÁNEA DE ESTUDIANTES DE ENFERMERÍA EN MURCIA (ESPAÑA)

Resumen

Introducción: La dieta Mediterránea está reconocida como una de los patrones dietéticos más saludables pero, incluso en los propios países mediterráneos se está produciendo un deterioro y abandonando de la misma. Los hábitos dietéticos quedan establecidos generalmente durante la adolescencia pero durante el periodo universitario los estudiantes pueden sufrir cambios importantes en su estilo de vida. El índice KIDMED está reconocido como una buena herramienta para la evaluación de la adherencia a la dieta mediterránea (ADM).

Objetivo: El propósito de este estudio ha sido evaluar la ADM de estudiantes universitarios y evidenciar posibles variaciones a lo largo de la etapa universitaria valorando diferencias entre los cursos.

Método: Se llevó a cabo un estudio transversal con 213 alumnos de primer curso y 105 de cuarto curso. Se clasificó a los estudiantes por sexo, tipo de residencia (en casa con sus padres o fuera de casa) e índice de masa corporal (IMC) (< 25 o > 25).

Resultados: El IMC para la muestra completa fue de 24,35 ± 2,71 en hombres y 22,54 ± 3,25 en mujeres (p < 0,001). La puntuación media de ADM fue de 7,0 ± 1,9, habiendo un 43% de estudiantes que mostraban una adherencia Buena. En general, se observó un bajo consumo de frutas, verduras y arroz o pasta, alimentos que están encuadrados en la base de la pirámide alimentaria. El consumo de aceite de oliva y legumbres resultó muy elevado y se encontró relación directa entre personas con sobrepeso (IMC > 25) y el hecho de no desayunar habitualmente (p < 0,05). No se han encontrado diferencias significativas entre alumnos de primero y cuarto curso aunque los alumnos de cuarto y que vivían fuera de casa presentaron un nivel de ADM mejor que el resto (p < 0,001).

Conclusiones: Se recomiendan programas educacionales para motivar el consumo de los diferentes grupos de alimentos en general y especialmente estrategias para fomentar el consumo de frutas y verduras en el espacio universitario así como la práctica saludable del desayuno.

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Palabras clave: *Dieta mediterránea. Enfermería. Universitarios. Nutrición.*

Introduction

It is well documented that healthy eating habits and lifestyles are closely associated with the prevention of chronic diseases such as diabetes, obesity, Alzheimer's, hepatic steatosis and several cardiovascular diseases[1-3]. The first scientific reference dates from 1953, when L. Allbaugh[4] compared eating habits and lifestyles Greece and the USA, although it was A. Keys who first applied the name of "Mediterranean Diet" (MD) to some healthy dietary habits found around the Mediterranean region[5-7].

The MD can be described as the dietary pattern widely followed in countries as Spain, Greece, Italy and Morocco which, has been included by the UNESCO in the intangible cultural Heritage of Humanity, as a nutritional prototype of worldwide value[8]. The traditional MD is characterized by a high intake of vegetables (legumes, cereals, olive oil, seeds, fruits and nuts); a moderate intake of fish, seafood and ethanol (principally wine during meals), low-to-moderate intake of dairy products (cheese and yogurt) and eggs and a low intake of meat, accompanied by other habits such as the "siesta" (after-meal nap)[9]. In addition, these foods are normally consumed in season, in fresh or minimally processed form, which increases the availability and utilization of micronutrients and antioxidants[10]. Some of the benefits of MD has been recently demonstrated in the PREDIMED study[11] when Spanish investigators confirmed that MD supplemented with extra-virgin olive oil or nuts reduce the incidence of major cardiovascular events among persons at high cardiovascular risk.

Dietary habits are usually acquired at home watching what our parents cook and eat, especially at an early age. Attending university may lead to changes in habits and lifestyle as a result of many factors: some university students no longer live with their parents, students must adapt to stress and emotional challenges, while physical activity tends to be overlooked[12]. It has been claimed that such changes in the university period may have a significant impact on health, accompanied by the increase risk of developing chronic diseases such as obesity, diabetes, cancer and heart disease[13].

To evaluate the degree of adherence to the Mediterranean diet (AMD) several indexes have been developed[14-16]. However, they are not easy to apply and require many data. Nowadays the most widely accepted index for evaluating AMD is the KIDMED index[10], whose usefulness has been corroborated many times[17-19].

The University of Murcia is member of REUS (Red Española de Universidades Saludables-Spanish Association of Health Conscious Universities), and it is hoped that the present study will provide useful data for evaluating the need for nutritional educational programmes to establish healthy eating habits and lifestyles for students during their university course.

Eating and life style habits may suffer changes during a student's life at university. Such a comparison between different years has been made previously in other places as Zagreb[20], North Carolina[21] and Minnesota[22] but not in Spain.

Students studying many degrees could have been evaluated, but we considered that health sciences students should have higher perception of healthy dietary habits and therefore follow better dietary patterns. Student nurses, particularly those studying to be nutrition nurses are destined to work closely with patients and could influence the dietary habits of these patients[23].

The aim of this study, therefore, was to evaluate the AMD of nursing students and to compare the results found for first and fourth year students at the University of Murcia analyzing several related factors.

Methods

Subject

The cross-sectional study was designed to evaluate and compare the eating habits among undergraduate nursing students from the University of Murcia. The sample comprised 318 students, 213 from the first academic year (48 males and 165 females) and 105 from the fourth year (26 males and 69 females). Students were classified according gender, residence (family or non family, including shared flat, hall of residence, etc) and body mass index (BMI) (normal weight, overweight or obese).

This study did not need ethical approval because no invasive procedures were necessary. All students volunteered for the study.

Methods

To assess the AMD between first and fourth year nursing degree students, a self-administered questionnaire KIDMED was used. Development of the KIDMED[10] index was based on principles sustaining the Mediterranean dietary patterns as well as on those that undermine it. The questionnaire is based on 16 questions and the index ranges from 0 to 12. Four questions denote a negative connotation with respect to the Mediterranean diet and assign a value of **-**1, while the rest of the questions have a positive aspect and they are given a score of **+**1. The sums of the values from the administered test were classified into three levels: (1) 8-12, optimal Mediterranean diet; (2) 4–7, improvement needed to adjust intake to Mediterranean patterns; (3) 0-3, very low diet quality.

Statistical analysis

The statistical software package IBM SPSS Statistics v19.0 (SPSS Inc.; Chicago, Illinois USA) was used for the analysis of data. Chi-square analysis was

performed to evaluate relationships between qualitative variables and Student-t test to compare quantitative variables between groups. Differences were considered significant at $p < 0.05$.

Data were grouped according to degree years (1st or 4th), gender, residence (familiar or other) and BMI status (BMI > 25 or BMI < 25).

Results

The distribution of volunteers is shown in table I. Most of the volunteers were female (77.5%), lived at home with their families (76.3%) and had BMI < 25 (79.7%).

The results for BMI are shown for the total sample, according to year, gender and residence (table II). As was expected, there was significant differences between men and women, with men having a higher BMI in both years ($p < 0.001$).

The results for the KIDMED test for the total sample and grouped according to categories are shown in table III. As regards the total sample, 43.4% of all students had a good AMD score and only 3.1% poor AMD, with an average index of 7.0.

Differences between genders were statistically significant, with men consuming more pasta/rice ($p < 0.001$), nuts ($p < 0.05$), dairy products for breakfast and fast-food ($p < 0.001$) but fewer vegetables ($p < 0.001$). As regards place of residence, the consumption of fast-food ($p < 0.01$) and sweets/candies ($p < 0.05$) was greater for students living at home. In the case of BMI, overweight students showed a higher consumption of a second piece of fruit/day and a lower consumption of sweets/candies ($p < 0.001$) but they also skipped breakfast more often ($p < 0.01$).

First year students

In first year students, statistically significant differences existed between males and females regarding the consumption of vegetables ($p < 0.05$) and sweets every day ($p < 0.001$), women showing higher values (75.8% *vs* 58.3% and 18.8% *vs* 8.3%, respectively). In contrast, males usually took more dairy products (97.9% *vs* 85.5%) and went more than once a week to a fast-food restaurant (41.7% *vs* 21.2%) with $p < 0.001$ (table IV).

As regards where students lived (familiar or not), no statistical differences were found in the adherence to the Mediterranean diet pattern, but students who live away from seemed to show a higher adherence (41.1% *vs* 36.7% showed a good AMD). In contrast, we observed that legumes were consumed more frequently by students living at home ($p < 0.05$) (table IV).

Overweight students (BMI > 25) tended to have a healthier diet, following a Mediterranean pattern, than students with BMI below 25. This could explain some of the statistical differences we found in our study; for instance, overweight people consume a second fruit per day ($p < 0.05$) and but not sweets/candies frequently ($p < 0.001$).

Fourth year students

As shows table IV there were some differences in the AMD regarding fourth year students (table IV). For example, men consumed fewer vegetables but more pasta/rice, nuts and go more often to fast-food restaurants, in all cases with significant differences.

AMD tended to be better in those student living away from home (8.13 *vs* 6.82; $p < 0.001$) being more students in the good AMD quality group (68.8% *vs*

Table I
Description and distribution of sample

	Total	Age (median)	Gender		Residence		BMI	
			Male	Female	With family	Others	< 25	> 25
1°	213	19	48 (22.5%)	165 (77.5%)	158 (76.3%)	49 (23.7%)	164 (77.7%)	47 (22.1%)
4°	105	22	36 (34.3%)	69 (65.7%)	73 (69.5%)	32 (30.5%)	88 (83.8%)	17 (16%)
Total	318		84 (26.4%)	234 (73.6%)	231 (74.0%)	81 (26.0%)	252 (79.7%)	64 (20.3%)

Table II
BMI of students by categories

Year degree	Total	Gender		Residence	
		Male	Female	With family	Others
1°	23.12 ± 3.46	24.48 ± 3.47	22.72 ± 3.07***	22.93 ± 3.32	23.79 ± 3.91
4°	22.81 ± 2.65	24.16 ± 2.16	22.10 ± 2.62***	22.29 ± 2.51	23.04 ± 2.70
Total	23.02 ± 3.21	24.35 ± 2.71	22.54 ± 3.25***	22.82 ± 3.20	23.34 ± 3.25

*** P < 0.001 of significant difference.

	Total	Gender		Residence		BMI	
		Male	Female	Familiar	Others	< 25	> 25
Takes a fruit or fruit juice every day	76.7	78.6	76.1	74.5	81.5	77.0	76.6
Has a second fruit every day	43.1	46.4	41.9	39.8	50.6	40.1	56.3***
Has fresh or cooked vegetables regularly once a day	68.6	52.4	74.4***	68.4	67.9	68.3	68.8
Has fresh or cooked vegetables more than once a day	24.2	15.5	27.4*	25.1	22.2	22.2	31.3
Consumes fish regularly (at least 2-3 times per week)	58.5	52.4	60.7	58.9	58.0	51.7	64.1
Likes legumes and eats them more than once a week	92.8	95.2	91.9	93.5	90.1	93.3	90.6
Consumes pasta or rice almost every day (5 or more times	38.1	54.8	32.1***	39.8	33.3	38.9	34.4
Has cereals or grains (bread, etc.) for breakfast	78.9	77.4	79.5	79.2	77.8	77.4	84.4
Consumes nuts regularly (at least 2-3 times per week)	41.5	51.2	38*	39.8	45.7	41.7	40.6
Uses olive oil at home	97.8	98.8	97.4	97.4	98.8	98.0	96.9
Skips breakfast	17.0	21.4	15.4	17.7	14.8	15.1	25*
Has a dairy product for breakfast (yoghurt, milk, etc.)	88.4	95.2	85.9***	88.3	87.7	89.7	82.8
Has commercially baked goods or pastries for breakfast	11.9	14.3	11.1	11.7	12.3	12.3	10.9
Goes more than once a week to a fast-food (hamburger)	23.6	41.7	17.1***	26.4	13.6**	23.4	23.4
Takes two yoghurts and/or some cheese (40 g) daily	60.1	56.0	61.5	58.4	63.0	58.3	67.2
Takes sweets and candy several times every day	12.6	9.5	13.7	14.7	7.4*	15.5	0***
Total punctuation (0-12)	7.0 ± 1.9	6.9 ± 2.0	7.1 ± 1.9	6.9 ± 1.9	7.3 ± 2.0	7.0 ± 1.9	7.3 ± 2.0
KIDMED Index Poor (≤ 3)	3.1	6.0	2.1	3.0	3.7	2.8	4.7
Average (4–7)	53.5	50.0	54.7	56.3	46.9	55.6	43.8
Good (≥ 8)	43.4	44.0	43.2	40.7	49.4	41.7	51.6

* $P < 0.05$ of significant difference.
** $P < 0.01$ of significant difference.
*** $P < 0.001$ of significant difference.

39.7%; $p < 0.01$). These differences are mainly related to intake of fruits and nuts, both of which showed significant differences.

In the case of BMI, it is significant that overweight students tended to skip breakfast more than the rest of the students (14.8% *vs* 35.3%; $p < 0.05$).

Comparison between first and fourth year students

No statistical differences in the degree of AMD were seen between first and fourth year students although adherence was greater in fourth year students (40.8% *vs* 48.6%) (table IV).

As regards individual questions (table IV) there were statistical differences in the consumption of cereal or grains for breakfast and the daily consumption of sweets and candy: 75.6% of first year students had cereal or bread for breakfast, while 85.7% of fourth year volunteers did so ($p < 0.05$), while 16.4% of first year students ate sweets several times a day *vs* 4.8% of fourth year students ($p < 0.001$).

Discussion

The mean BMI recorded is 23.02 with significant differences between gender (24.35 for males and 22.54 for females; $p < 0.001$) (table II). These results are

slightly higher than those for other regions of Spain such as Soria[24], Galicia[25], Navarra[26] or Balearic Islands[27] and closer to others studies developed in Murcia[28]. These are also in line with some official studies where the prevalence of obese people is higher in southern regions of Spain[29]. On the other hand, the BMI in our study was similar to that described for medical students in northern Greece, another Mediterranean region[30], and significantly lower than that described for students in North Carolina, USA[21].

The KIDMED index showed that 43.4% of students as a whole had a good AMD score, which is higher than the 33% recorded in Galicia[25] and the 28.4% mentioned for the University of Navarra[26]. At the same time the prevalence of students with a poor AMD was 3.2%, much lower than for Galicia (23.0%) and Navarra (9.1%). Such differences may due to the different dietary culture since in the Mediterranean area of Spain, including Murcia, the MD is still more closely followed that in northern regions.

Analysis of the different items identified several negative aspects in our population. For example one in four students does not consume fruits regularly and fewer than half have a second piece. The consumption of vegetables is even worse: one in three students does not consume vegetables daily and only one in four consumes them twice per day. Fruits and vegetables have a very important mission in the body as regulators of the metabolism and both are included in the Mediter-

Table IV

Results for KIDMED test of 1st and 4th year for total students and by categories

	First year							Fourth year						
		Gender		Residence		BMI			Gender		Residence		BMI	
	Total	Male	Female	Familiar	Other	<25	>25	Total	Male	Female	Familiar	Other	<25	>25
Takes a fruit or fruit juice every day	78.4	85.4	76.4	77.8	77.6	79.3	76.6	73.3	69.4	75.4	67.1	87.5*	72.7	76.5
Has a second fruit every day	43.2	47.9	41.8	42.4	42.9	40.2	55.3*	42.9	44.4	42.0	34.2	62.5**	39.8	58.8
Has fresh or cooked vegetables regularly once a day	71.8	58.3	75.8**	71.5	71.4	70.1	76.6	61.9	44,4	71.0**	61.6	62.5	64.8	47.1
Has fresh or cooked vegetables more than once a day	24.4	18.8	26.1	25.9	20.4	22.0	31.9	23.8	11,1	30.4*	23.3	25.0	22.7	29.4
Consumes fish regularly (at least 2-3 times per week)	56.3	50.0	58.2	58.2	51.0	54.9	61.7	62.9	55.6	66.7	60.3	68.8	61.4	70.6
Likes legumes and eats them more than once a week	93.4	97.9	92.1	95.6	85.7*	93.3	93.6	91.4	91.7	91.3	89.0	96.9	93.2	82.4
Consumes pasta or rice almost every day (5 or more times per week)	37.1	43.8	35.2	39.2	30.6	39.0	29.8	40.0	69,4	24.6***	41.1	37.5	38.6	47.1
Has cereals or grains (bread, etc.) for breakfast	75.6	77.1	75.2	75.9	73.5	73.2	83.0	85.7	77.8	89.9	86.3	84.4	85.2	88.2
Consumes nuts regularly (at least 2-3 times per week)	40.4	43.8	39.4	41.1	36.7	39.0	44.7	43.8	61,1	34.8**	37.0	59.4*	46.6	29.4
Uses olive oil at home	97.7	97.9	97.6	97.5	98.0	97.6	97.9	98.1	100.0	97.1	97.3	100	98.9	94.1
Has breakfast everyday	16.4	18.7	15.8	16.5	16.3	15.2	21.3	18.1	25.0	14.5	20.5	12.5	14.8	35.3*
Has a dairy product for breakfast (yoghurt, milk, etc.)	88.3	97.9	85.5***	88.6	85.7	89.0	85.1	88.6	91.7	87.0	87.7	90.6	90.9	76.5
Has commercially baked goods or pastries for breakfast	12.7	14.6	12.1	12.0	14.3	13.4	10.6	10.5	13.9	8.7	11.0	9.4	10.2	11.8
Goes more than once a week to a fast-food (hamburger)	25.8	41.7	21.2***	27.8	16.3*	26.8	21.3	19.0	41.7	7.2***	23.3	9.4	17.0	29.4
Takes two yoghurts and/or some cheese (40 g) daily	59.2	50.0	61.8	58.2	59.2	57.3	66.0	61.9	63.9	60.9	58.9	68.8	60.2	70.6
Takes sweets and candy several times every day	16.4	8.3	18.8*	18.4	12.2	20.7	0.0***	4.8	11.1	1.4	6.8	0.0	5.7	0.0
Total punctuation (0-12)	6.9±1.9	6.9±1.8	7.0±2.0	6.7±2.0	7.0±1.9	6.8±1.9	7.5±1.9**	7.2±1.9	6.9±2.3	7.4±1.6	6.8±1.7	8.1±1.8***	7.3±1.7	6.9±2.4
KIDMED Index														
Poor (≤3)	3.3	4.2	3.0	6.1	2.5	3.0	4.3	2.9	8.3	0.0	4.1	0.0	2.3	5.9
Average (4-7)	55.9	52.1	57.0	57.1	56.3	59.1	42.6	48.6	47.2	49.3	56.2	31.3**	48.9	47.1
Good (≥8)	40.8	43.8	40.0	36.7	41.1	37.8	53.2	48.6	44.4	50.7	39.7	68.8**	48.9	47.1

* P<0.05 of significant difference.

** P<0.01 of significant difference.

*** P<0.001 of significant difference.

ranean diet pattern. They are cheap, easy to find and not perishable so there is no logical reason to avoid them as a snack or in meals. This finding should serve as a reminder concerning student's knowledge of the benefits to be gained from eating fruits and vegetables and any perceived negative factors should be analysed on attempt to avoid them.

The consumption of pasta and rice was also less than recommended. These products are the base of the food pyramid as energy suppliers and should be consumed almost daily.

Skipping breakfast is a practice not to be recommended because breakfast is essential to provide energy and nutrients to start the day. Some studies have confirmed the relation between skipping breakfast and lower attention capabilities[31].

Another negative finding was that almost one in four students goes more than once a week to fast-food restaurant, a well established practice in students, especially at weekends. Fast food restaurants are cheap, they offer quick service and the food is standardized, attributes which seem to be appreciated for students. But fast food is not exempt of harmful effects related with saturated fats, salt, sugar and energy levels. Information in this respect should be given to students to improve their dietary habits even eating out.

But our study also found positive aspects. The consumption of olive oil was high. Almost all students use it at home, even for cooking. It is important to extend the use of this fat over others to increase levels of oleic fatty acid and antioxidants[32].

Another positive aspect was the consumption of legumes (92.8%), dairy products for breakfast (88.4%) and the low consume of commercial bakery goods for breakfast.

In the study developed in Galicia several findings were similar results to ours: e.g. the consumption of 1 piece of fruit/day, fish 2-3 times/week, cereal/grains and dairy products for breakfast (also tendency to skip breakfast), yoghurt or cheese daily and olive oil.

In other respects there were important differences. In our study males are more likely to consume a second piece of fruit/day, legumes, pasta/rice and nuts but also to go more often to fast-food restaurants, while they consume fewer sweets/candies. Females consume more vegetables and nuts than their Galician counterparts[25].

Comparing with the findings for Navarra[26], students from Murcia are more likely to consume a second piece of fruit/day, legumes, nuts and olive oil. Males have a higher consumption of fast-food and lower consumption commercially baked goods for breakfast, and sweets and candies. Females consume more pasta/rice and yoghourt/cheese.

Other studies have evaluated dietary patterns but with different tests. A study developed at Hacettepe University in Turkey reported that dairy products, cereals and fruits/vegetables were consumed daily by only 22.3%, 48,5% and 25.2% of students respectively,

while consumption of nuts was between 8.0-25.9% (depending on intake frequency/week). Only 25.9% of students were reported to have breakfast every day[33]. All these data are much lower than data from our results.

Other study developed in Zagreb pointed to a similar consumption of fruits, cereals and dairy products, while in the case of vegetables consumption is higher in our students[20].

If we analyse the results of KIDMED test bearing in mind where the students live (with their families or not), we found that students living away from home go to fast-food restaurants less and consume fewer sweets/candies (p < 0.05). It seems that students living on their own have less money to spend and so tend to eat out less often.

When AMD scores are compared between normoweight (BMI < 25) and overweight (BMI > 25) students, we find that the second group tends to score higher for almost all items. There is a higher consumption of a second piece of fruit/day (56.3% *vs* 40.1%) and lower consumption of sweets and candies (0% *vs* 15.5%) both with statistically significant differences (p < 0.005). However, is that overweight students are more likely to report to skip breakfast (25% *vs* the 15.1%; p < 0.05). The KIDMED test scored averaged 7.0 for students with BMI < 25 and 7.3 for students with BMI > 25. These differences as a whole suggest that at least some of the overweight students may be on a diet in an attempt to lose weight. This would explain the fact that they tend to skip breakfast more than the other students (in order to take fewer calories) despite the fact that many authors think this is a poor practice[34, 35].

While quite similar in both groups of students, the BMI was slightly lower in fourth year students (table III), suggesting that university students tend to be aware of their bodies and image, and therefore take increasing care on their dietary pattern and take physical activity.

Although physical activity was not evaluated, the KIDMED score was slightly higher in fourth year students, and there is an increment of students included in good AMD group (48.6% *vs* 40.8%). Although these differences are not significant, the data suggest that students learn better dietary patterns over these three years. This was especially borne out by differences which were significant; for example, the higher consumption of cereals for breakfast (p < 0.05) and lower consumption of sweets/candies (p < 0.001).

If we compare the different years according to where students live, we find that in the case of fourth year students, those who live away from home have a higher AMD score than others (8.1 and 6.8, respectively; p < 0.001) increasing the good AMD group in detriment to the medium AMD group (p < 0.01). The score was also higher for first year student living away from (8.1 *vs* 7.0; p < 0.001). At first sight, students should have a better diet when they live at home because their parents

presumably have a greater perception of good dietary patterns, as described by several authors[36,37]. On the other hand, if we consider that the MD is slowly being eroded at home, students who are responsible for their own, are free to choose between different options of food and can therefore express better their knowledge of good dietary patterns. This knowledge grows during a student's time at university. The difference between 1st and 4th year students living away from home mainly lies in the consumption of a second piece of fruit/day and fish ($p < 0.05$), legumes and nuts ($p < 0.01$), and fewer sweets/candies ($p < 0.001$).

The rest of the items pointed to no significant differences between first and fourth years, whether by gender or by BMI.

Conclusions

According to our study dietary patterns are better in student nurses from Murcia than in other regions, although several practices should be improved. The consumption of fruits, vegetables and pasta/rice should be increased, taking account their position at the base of the food pyramid. The AMD was similar for both years. Perhaps this reflects a lost opportunity to improve students' awareness of what a healthy diet is during their stay at university, which could become a place where healthy dietary patterns are improved and established. We found that students living on their own are receptive to nutritional information and improve their dietary patterns. Additional research is necessary to evaluate negative factors and to identify ways to improve the dietary pattern in the whole university population. We suggest strategies to improve knowledge of dietary patterns based on an approach to healthier foods: for example, vending machines with fruit, lower prices for fruit in canteens and educational programs about the importance of breakfast. These are just a few examples that could be taken into account.

Studies like this, focus on determine the status of a diet on a population should be complemented with long term and interventional studies. Cross-functional groups are required and also trained staff to follow volunteers almost daily. But these studies are not easy to perform and founds are usually difficult to achieve. Private companies of food industry should also be participants providing products in this kind of studies[38].

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