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Health Perception According to the Lifestyle of University Students

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Abstract

University students are characterized by having inadequate eating habits, along with an unhealthy lifestyle, which, among other factors, can affect the perception they have of their state of health. The aim of the study was to evaluate the health perception of a group of university students according to lifestyle. A cross-sectional observational study was carried out on 214 university students from different universities and branches of knowledge. Anthropometric data were collected. Three questionnaires were administered: PREDIMED (Mediterranean Diet (MD) adherence), SF-36 (perception of health state) and GPAQ (physical activity (PA)). The differences between variables were analyzed using Student-t or Mann–Whitney U, Kruskal–Wallis and Pearson Chi-Square tests. Statistical significance was reached at $p < 0.05$. Most students were found to be normal weighted. The subjects presented an moderate MD adherence, this being better in Health Sciences students. 75.7% practiced light PA. The health perception is worse for most of the subscales analyzed than that of the reference population (except physical-function, physical-role, and emotional-role). There is an association between PA and health perception: students with intense PA have less body pain and better physical function; the less active, the less vitality. The more physically active subjects the greater MD adherence. Lifestyle and eating habits of health sciences students are healthier than that of students from other branches of knowledge. The physically active subjects have a better perception of quality of life-related to health and greater MD adherence.

Keywords Students · University students · Physical activity · Mediterranean diet · Perceived health

Abbreviations

PA	Physical activity
HS	Health sciences
HRQOL	Health-Related to Quality of Life
MD	Mediterranean diet
GPAQ	Global Physical Activity Questionnaire
BMI	Body Mass Index
OBK	Other branches of knowledge
BK	Branch of knowledge
SF-36	Short-Form 36 Health Survey

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Introduction

The World Health Organisation defines health as a "state of complete physical, mental and social well-being, and not only as the absence of diseases or illnesses" [1]. Achieving an optimal state of health is complicated, since it is determined or influenced by different factors [2]. In general, it is considered that most of the determinants of health are modifiable to a greater or lesser extent. Many of the health problems, diseases or premature death in adulthood have their origin in the bad habits in the early stages of life [3].

Perceived health is a multifactorial indicator that provides information about people's health, both physical and mental, and is considered an important predictor of morbidity, mortality [4, 5], quality of life, well-being and health [6]. There is evidence of the association of self-perception of health with different socio-demographic, socio-economic and psychosocial factors: gender, age, educational level, nationality, marital status, place of residence, work situation, occupation and income or personality moods [7–10]. The factors related to lifestyle

(alcoholic [11] and smoking habits, consumption of fruits and vegetables [12] and physical activity (PA) [9–13]) are other important determinants in the perception of health. The studies carried out show a positive effect of healthy behaviours on health perception. Among the validated tools for measuring perceived health, the most widely used worldwide is the Health Survey SF-36 [14]. This scale is also used to assess quality of life related to health [15].

Habits of life, which include eating habits, PA, sedentary lifestyle, leisure, etc., begin their development in childhood, but it is in adolescence that they start to consolidate [16]. The university stage is a period of transition between adolescence and adulthood that is especially vulnerable for the acquisition of unhealthy lifestyles, given the changes it entails for most students [17–19]. Habits consolidated at this time will, most likely, remain during adulthood [14, 16]. The nutrition of university students is characterised by irregularity in meals, high consumption of fast food, alcoholic and sugary drinks, low intake of fruits and vegetables, nutritionally inadequate diets, with low nutritional density and, in some cases, eating disorders [20], together with a decrease in the practice of PA [21] and, in many cases, substance abuse [22, 23]. Thus, the dietetic pattern of university students differs greatly from the Mediterranean diet (MD) model. However, despite the obvious, university students usually perceive the quality of their diet as adequate, principally those who reside in the family home during the academic year, and study for degrees related to health or who have normal weight [24]. Different studies conducted in this population group have shown a low adherence to MD [16, 18, 25, 26] being lower in men than in women [27], and in students who live in university residences or shared flats rather than in those who live in the family home [26, 27].

It has been shown that the practice of PA during childhood is associated with greater probability of being an active person in adulthood. The promotion of PA among young people is therefore important [28]. However, several studies have shown that the university population is basically sedentary [29].

Time and again studies that demonstrate the importance of carrying out health promotion and prevention activities in the university population are published. Promoting healthy habits and lifestyles is important, since these will last into adulthood [27, 30]. However, there are no studies that assess the health perception in this population group based on their lifestyle, which may also be important as a motivating factor for the acquisition of healthy habits.

Therefore, the purpose of the present study was to evaluate the perception of health according to lifestyle in a group of university students.

Methods

A cross-sectional observational study was carried out with 214 volunteer university students who completed an anonymous online questionnaire during the second semester of the 2016–2017 academic year that included the following validated tools: MD Adherence Questionnaire of the Predimed Study [*Cuestionario de Adherencia a la Dieta Mediterránea del Estudio Predimed*] [31, 32], the Spanish version of the SF-36 questionnaire (Short-Form 36 Health Survey) [15] to assess the Health-Related Quality of Life (HRQoL) and the GPAQ questionnaire (Global Physical Activity Questionnaire) of the STEPS method, version 2.1, of the World Health Organisation [33]. Questions related to sex, age, weight and size, place of habitual residence, level of university studies, branch of knowledge, university in which they study and toxic habits (consumption of tobacco and alcohol) were also included. This study was conducted in accordance with the Declaration of Helsinki and all procedures involving human participants were approved by the Clinical Research Ethics Committee (CEIC) East Valladolid Healthcare Area.

The Predimed questionnaire consists of 14 items that refer to food consumption and the cooking techniques used for their preparation of the MD. A score of 0–14 points can be obtained, and adherence is assessed as high (≥ 10 points), average (6–9 points) and low (≤ 5 points) [32].

For the analysis of each dimension of the SF-36 questionnaire, the items were coded, added and transformed into a scale ranging from 0 (worst health status) to 100 (best health status) [34]. The scores of the different subscales of the questionnaire were normalised in relation to the Spanish reference population [34]. The subscales were added into the physical and mental components using the normalised weighted values [35]. The physical health component groups together the dimensions physical function, physical role, body pain and general health; the mental health component encompasses the dimensions vitality, social function, emotional role and mental health.

In the assessment of PA, the level of PA (intense, moderate and light), total PA (daily PA duration), physical activity in different situations (minutes per day dedicated to physical activity at work, dedicated to travel or leisure time) and sedentary lifestyle (people classified as sedentary and minutes a day dedicated to sedentary activities) were determined from the GPAQ items.

Statistical Analysis

The processing of missing values was not necessary since in the online questionnaire the completion of the items was

assigned as mandatory, so continuation was not possible if an item was left unanswered.

All data are presented as mean (SD) or median (25th–75th percentiles). The normality of the distribution of the variables was checked by the Kolmogorov Smirnov or by the Shapiro–Wilk tests. A t test or U-Mann–Whitney test was used for pairwise comparisons. Multiple comparisons were performed by Kruskal–Wallis tests, and post-hoc analysis by the Bonferroni test. The categorical variables were compared using Chi-squared test. The level of significance was set at $p < 0.05$. Statistical analysis was performed with SPSS® version 19.0 (SPSS, Chicago, IL, USA).

Results

The final sample consisted of 214 subjects: 53 men (24.8%) and 161 women (75.2%), with an average age of 22 years (range 18–46 years old). The participants came from 22 Spanish universities [public (88.8%) and private (11.2%)] and different branches of knowledge (BK): health sciences (HS) (52.8%), engineering and architecture (18.2%), social and legal sciences (11.7%), sciences (7.9%), arts and humanities (6.1%), physical activity and sports sciences (3.3%). Given the distribution of the BK and the objective of the study, the students were stratified into two groups: HS (52.8%) and other branches of knowledge (OBK) (47.2%), without differences in age.

The sample presented, on average, a BMI within normality [22.09 kg/m^2 (3.1)], although 16.4% of the subjects were overweight, 1.4% were obese, and 10.3% were underweight. Subjects who studied a degree in HS showed significantly lower BMI [7.21 kg/m^2 (3.0)] than students studying OBK [22.58 kg/m^2 (3.1)] ($p = 0.14$), although there were no differences in the nutritional cataloguing according to the BK ($p = 0.423$).

Regarding the assessed toxic habits, most of the students did not smoke (84.6%). There were no differences in smoking habits as a function of BK ($p = 0.194$). However, the vast majority of participants in the study stated that they drank alcohol (83.6%), mainly on an occasional basis (53.1%), without differences between the groups ($p = 0.574$).

The median score of the Predimed questionnaire that assesses adherence to the MD was 8 points (P25–P75: 6–9), so that the entire group presented an average adherence to MD (10.7% low adherence, 69.2% average adherence and 20.1% high adherence). Although both groups showed an average adherence based on BK, statistically significant differences were observed: HS: 8 points (7–9.5); OBK: 7 (6–9) ($p = 0.027$).

As already mentioned, the degree of physical activity of university students was analysed with the WHO GPAQ questionnaire. The vast majority of subjects performed light

physical activity (75.7%), while only 11 students (5.1%) practised intense activities. There were no significant differences in the degree of physical activity as a function of BK ($p = 0.543$).

Table 1 shows the score in the subscales of the SF-36 questionnaire, along with the normalised scores with respect to the reference population [34]. The score in the subscales that assess physical function, physical role and emotional role was higher than that of the reference population; while that of the rest of the subscales was lower. The average value of the standardised physical component was 52.9 points (5.7), which places it above the reference population, while the median of the standardised mental component was 46.8 points (35.4–52.2), slightly below the average. No statistically significant differences were observed in the two groups for any of the subscales or the grouped components.

We analysed if there was an association between the degree of adherence to the MD and health perception. Significant differences were only observed for the physical function subscale ($p = 0.019$). When this association was analysed in terms of BK, only the HS subjects with low adherence to MD were found to have better vitality than the rest ($p = 0.036$).

Regarding the relationship between perceived health and degree of physical activity, significant differences were observed for three subscales: subjects with light activity had lower vitality than the rest ($p = 0.012$); students with intense physical activity had a better score on the subscale body pain than the others ($p = 0.015$); whereas the score of the physical function subscale increased significantly with the level of physical activity ($p = 0.004$). In addition, HS students who practised intense physical activity scored better on the subscale body pain ($p = 0.003$). And the OBK students with an intense degree of physical activity had better physical function ($p = 0.032$) and body pain ($p = 0.033$), while those with light activity had worse vitality ($p = 0.046$).

Finally, the association between the cataloguing of physical activity and adherence to the MD was statistically significant ($p = 0.022$) for the entire group, although

Table 1 Rating of the subscales of the SF-36

Scales SF-36	Weighted score (0–100)	Standard Z-score
Physical function	95 (90–100)	0.43 (0.22 to 0.64)
Physical role	100 (75–100)	0.48 (−0.23 to 0.48)
Body pain	72 (61–84)	−0.25 (−0.65 to 0.18)
General health	67 (57–77)	−0.06 (−0.50 to 0.39)
Vitality	60 (50–70)	−0.31 (−0.76 to 0.14)
Social function	87.5 (75–100)	−0.13 (−0.76 to 0.50)
Emotional role	100 (33.3–100)	0.38 (−1.84 to 0.38)
Mental health	68 (52–80)	−0.26 (−1.06 to 0.33)

The variables are described as Median (P25–P75)

this relationship was due to that observed in the HS students (p = 0.002), and not to those of the OBK (p = 0.606) (Table 2).

Discussion

The present study was carried out with a group of students from different universities and branches of knowledge. More women than men participated (75.2 vs. 24.8%, respectively), which has already been documented in other studies [6, 16, 30, 36–38]. The sample studied had a BMI in the range of normal, so it does not differ from other university populations in our country [25–27, 36, 38, 39]. However, HS students presented a significantly lower BMI than the rest, which may reflect a greater concern for having good health; although it is also true that the sample may be biased, given that part of the HS students were studying the degree of human nutrition and dietetics. However, this finding has also been observed in other studies [16, 40].

The analysis of toxic habits was evaluated based on smoking and alcohol consumption. It is encouraging to verify that most of the subjects in the sample were not smokers (84.6%). Similar results have been observed in other recent Spanish studies [20, 26]. It is very likely this results from the entry into force of the so-called "Anti-tobacco Law" (Law 42/2010, of 30 December 2010) [41]. Studies conducted in other countries document higher tobacco consumption among students than in Spanish studies [42–44]. With regard to alcohol consumption, most participants do follow this practice (83.6%), this consumption being mostly occasional, which has already been shown in other studies [30, 36]. Contrary to what occurs with smoking, alcohol consumption is higher than in other countries [42–44].

Adherence to the MD was evaluated using the Predimed questionnaire, which obtained a degree of average adherence (8 points), higher than that obtained by the Extremadura group with this same questionnaire (5.72 points) [45]. There are many works that analyse adherence to MD in different populations, including that of students; however, different evaluation questionnaires have been used for this [46, 47].

The use of these tools in studies with university students has revealed a low to average adherence to MD [16, 20, 26, 48]. Thus, it seems that the diet of the students of the present work is healthier than that documented in other studies. This may be due to the fact that almost half of our participants are from Health Sciences, although Montero et al. [40] claim that having knowledge in nutrition is not sufficient in itself to have healthy life habits [49].

Physical activity was analysed through the GPAQ questionnaire, which classifies global physical activity taking into account the physical activity of work, travel and free time, as well as sedentary lifestyle. The majority of students (75.7%) presented a light activity, lower than that obtained in other studies [4, 20, 50]. Although the methodology for the evaluation of physical activity is very diverse, and the GPAQ has been used in very few studies of university students, most of the works report reduced physical activities, but not as much as in the present work. The latest survey on sports habits in Spain, conducted in 2010, shows that, although the practice of physical activity in the Spanish population is not high, there has been an increase in recent years [51]. However, this is not observed in the study sample. It is possible that the GPAQ information collection methodology and its weighting in the analysis of global activity over-penalises the lack of physical activity at work and travelling, given that most of the subjects of the study did practise sports with some regularity.

The SF-36 questionnaire is the most widely used for assessing perceived health. However, this tool is usually used to analyse the perception of health and quality of life in patients with different pathologies and to assess the recovery of these same. For that reason, too many works have not been published that analyse the health perception of healthy and young population; in some cases, only the transition item that assesses the change in general state of health with respect to the previous year is applied or a simple general question is asked about how the individual perceives his/her health. It can be considered that the perception of the health of university students is not very good, since when the values of the different subscales are compared with those of the reference population a higher

Table 2 Degree of physical activity based on adherence to the MD by branch of knowledge

Adherence to the MD	Degree of physical activity						Total	
	Light activity		Moderate activity		Intense activity			
	HS	OBK	HS	OBK	HS	OBK	HS	OBK
Low	**6**	*13*	**1**	*3*	**0**	*0*	**7**	*16*
Average	**66**	*51*	**12**	*14*	**0**	*5*	**78**	*70*
High	**17**	*9*	**6**	*5*	**5**	*1*	**28**	*15*
Total	**89**	*73*	**19**	*22*	**5**	*6*	**113**	*101*

In bold the data of the students of the Health Sciences (HS); in italics, those of other branches of knowledge (OBK). MD: Mediterranean Diet

score has only been obtained in three of them: physical function, physical role and emotional role. It seems logical to think that university students, population with an average age of 22 years, have fewer problems in "carrying out all kinds of physical activities, including the most vigorous, without any limitation due to health" (physical function) or in performing "work or other daily activities" (Physical Role) normally as compared to the somewhat higher age of the reference population (average age of 45.2 years) [34]. Nor should students have "any problems with work and other daily activities due to emotional problems" (emotional role), since, in principle, their responsibilities should be lower than those of the reference population (family, work, children, sick parents etc.). However, the worst scores obtained by students in the sub-scales body pain, vitality, social function and mental health are surprising. The data was collected between the months of February and April, a period that coincides with the beginning of the second semester and the Easter holidays. Students should not therefore be especially fatigued or stressed (worse vitality or body pain). However, some studies have obtained similar results [43]. When assessing perceived health according to the branches of knowledge, no differences were found for any of the subscales in the study sample. Other investigations have obtained worse scores in HS students in the different subscales of perception of the quality of life related to health than in the present study, with the exception of the physical and mental components [52].

Regarding the association between perceived health and the degree of adherence to MD, our study only found a significant relationship with the subscale physical function. It is possible that a larger sample size is needed to appreciate this association so often demonstrated, since, in this case, the majority of students (69.2%) had an average degree of adherence. The perception of a better state of health in people with a greater adherence to MD may be due to the protective effect and the benefits attributed to MD, both at the metabolic level [53, 54], and at the psychic level and body pain [55, 56]. On the other hand, a pattern of Western consumption has been associated with a worse perception of quality of life, mainly in the mental subscales, but also in the physical subscales [57].

Coinciding with what has been observed in this work, different publications have shown a better perception of the quality of life related to health in those people who have higher levels of PA [4, 37, 58]. The magnitude of the association varies according to the sub-scales analysed and the gender [58]. This association could be explained thanks to the benefits of PA, both physically and psychologically and socially [59–61]. In general, people who perform PA on a regular basis perceive themselves as healthier, with less stress and have a better state of mind than those who do not practice it [61].

The practice of physical activity has been positively related to the MD: subjects who perform more physical activity have a greater adherence to MD [18]. And these findings have also been observed in the present study. It seems that this healthy lifestyle improves health perception, as recently published in a study conducted with adolescents, which suggests that adherence to MD and the practice of physical activity improve self-esteem [61]. Unhealthy lifestyles, in addition to influencing a worse health self-perception, also have an impact on future health, so it would be advisable to promote healthy lifestyles in this population type.

This work has some limitations, such as the sample size, the voluntary nature of the participants and the fact that half of the sample is HS. However, the study was not designed to extrapolate the results to Spanish university students, but to be a pilot experience. We intend to continue working on this line of research, increasing the sample size and the type of population evaluated (students, teaching staff and administration and services).

In conclusion, the lifestyle of the university students analysed is improvable, because although the smoking habit has been reduced, its degree of adherence to MD is average, and the level of physical activity is reduced. The HS students seem healthier than the rest, since they have a significantly lower body mass index and a higher degree of adherence to the MD. It has been shown that the physically active subjects have a better perception of quality of life related to health and greater adherence to the MD.

Compliance with Ethical Standards

Conflict of interest The authors declare that they have no conflict of interest.

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