

Research Article

# Changes in the lifestyle in Spanish University population during the confinement for COVID-19

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**Abstract:** (1) Background: The aim of this study was to evaluate the influence of the lockdown due to COVID-19 pandemic, eating and physical activity behaviours, in a University population. A healthy diet such as the Mediterranean Diet (MD) pattern, rich in fruit and vegetables can prevent degenerative diseases such as obesity, diabetes, cardiovascular diseases, etc. (2) Methods: We conducted a cross-sectional study, data were collected by an anonymous online questionnaire. Participants completed a survey consisting of 3 sections: sociodemographic data; dietary and physical activity behaviour; questionnaire of the Mediterranean Diet (MEDAS-14) and the emotional eater questionnaire Garaulet (EEQ). (3) Results: A total of 168 participants completed the questionnaire 66.7% women, from Spain 79.2%, 76.8% students, living in family home 76.2% and in normal weight 66.1%. Our population did the grocery 1 or less per week (76.8%); decreased or stay the same the consumption of fruits (57.1%), vegetables (58.9%), dairy products (74.4%), pulses (73.2%), fish/seafood (76.8%), white meat (83.3%), red and processed meat (91.1%), snacks (78.6%), rice/pasta/potatoes (78.6%), nuts (83.9%), low alcohol drinks (89.3%), spirits (98.8%) and sugary drinks (91.7%). Increased cooking time (73.2%) and decreased or stay the same their physical activity (63.7%). University Employees increased more weight (1.01±0.02) than students (0.99±0.03) (p<0.05). 79.8% of the participant obtained a Medium/High Adherence to the MD. Emotional and very emotional eaters were higher in women group (p<0.01). (4) Conclusions: In the event of further confinement, strategies should be implemented to promote a balanced and healthy diet together with the practice of physical activity, taking special care of the group of women and University Employees.

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**Keywords:** COVID-19, eating habits, physical activity, MEDAS-14, Emotional eating questionnaire (EEQ) and university population.

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## 1. Introduction

At the end of 2019, a new highly infectious and pathogenic strain of RNA viruses belonging to the Coronaviridae family has emerged in Wuhan, China [1]. 'Coronavirus disease 2019' (COVID-19) showed high mortality rates and a rapid human-to-human worldwide spread that switched into a global health emergency a few months after its outbreak, leading the World Health Organization (WHO) to declare it a pandemic in March 2020 [2]. Every country around the world confirming COVID-19-positive cases established strict preventive health measures to avoid viral transmission, including exhaustive testing, case tracing, and severe social restrictions. However, these limitations showed poor efficacy against infection thus, governments were finally forced to determine mandatory quarantine at home [3]. Due to the gravity of situation in Spain a State of Alarm was declared on March 24, 2020 [4], which for the population resulted in serious social restrictions. During this period there was the confinement of the Spanish population in their homes, leaving only allowing them to perform very limited core activities. This confinement lasted until May 2, 2020. From that moment on, the entire population was allowed to leave their homes, regulating their presence on public roads by age and time zone[5].

In the case of university education, at first it was suspended for a few days or weeks, depending on the decision of each entity. Subsequently, and with the extension of the confinement, the majority chose to continue teaching online until the next academic year. In the case of Universidad Europea del Atlántico, teaching online was carried out sequentially subject by subject and in-person optional reinforcement classes in June and ordinary face-to-face exams in July and September.

These rigorous social measures affected the lifestyle habits of the population, mostly those related to eating patterns and physical activity[6]. It is worth mentioning that this imposed isolation at home was considered as a stressful situation that further influenced our diet routine since people used to cook more and consume more appetizing meals, snacks, or alcohol [7–11]. Intending to avoid a poor nutritional diet during the lockdown, the WHO published dietary guidelines highlighting the need for balanced diet patterns suggesting the consumption of 9 fruits and vegetable servings/day (4 and 5 servings/day respectively) together with legumes, meat, and foods made of whole grain cereals. Intending to avoid a poor nutritional diet during the lockdown, the WHO published dietary guidelines highlighting the need for balanced diet patterns suggesting the consumption of 9 fruits and vegetable servings/day (4 and 5 servings/day respectively) together with legumes, meat, and foods made of whole grain cereals [2]. It is important to note that these dietary recommendations described all the main nutritional elements of the Mediterranean diet (MD)[11,12].

It is currently a fact that MD is one of the most beneficial dietary patterns known around the world [13–15]. Fruits, vegetables, nuts, legumes, whole grains, and olive oil are the most representative foods of this diet rich in bioactive components such as polyphenols (the main group of plant-derived metabolites [16]), conferring high anti-inflammatory, antioxidant, antimicrobial, immunomodulatory, antiviral, or neuroprotective beneficial properties [17–21]. Thanks to these healthy phytochemicals, MD has been widely associated with a lower risk of developing chronic inflammatory diseases and related comorbidities (obesity, type 2 diabetes, and metabolic syndrome), cancer, or age-associated disorders among others [14,15].

In the current pandemic situation, the lockdown imposed by the governments due to the SARS-Cov-2 spread has critically influenced our lifestyle habits. Numerous studies

worldwide from many countries and regions have analysed the consequences on our health after the quarantine with diverse outcomes depending on the adherence to a specific diet pattern and physical activity schedule [7,11,22–29]. But very few have focused on studying the consequences of this situation in the university population[30,31], which, in addition to the stress caused by the global pandemic, in the case of students, had to continue with their studies preparing papers and preparing final exams and the university staff that had to readapt their work and teaching to the virtual environment in real time and nobody else has investigated the effect of confinement in the emotional eating behaviour. In this context, we aimed to evaluate whether the quarantine associated with the COVID-19 pandemic situation has influenced or modified the dietary habits (specifically the adherence to MD) and emotional eater behaviour and physical activity practices of a population comprising staff and students belonging to the Universidad Europea del Atlántico.

## 2. Materials and Methods

### 2.1 Selection of Participants and Study Design

A cross-sectional descriptive study based on a self-administered questionnaire was carried out. It was a non-probabilistic sample used for the convenience since the questionnaire was directed towards people of legal age ( $\geq 18$  years old) from the University community recruited online. The collection of information began on April 28, 2020; 46 days after lockdown had begun (Phase1) and the last data was sent on May 29, 2020.

For the correct collection of the information, the Google forms application which allows the anonymity of the participants was used. The questionnaire was directed towards the whole University community (students, teachers, and administrative staff), by email. After agreeing to complete the questionnaire, participants were asked to answer the questions of the self-administered online questionnaire (filling in time of less than 30 min) informing them that they could interrupt the compilation at any time, without the obligation to justify the decision. Participation in the study was voluntary and completely free.

The study was approved by the Committee of Ethics of Investigation of the Universidad Europea del Atlántico (C-12 /2020), being that all the compiled information anonymously was treated with maximum confidentiality, in accordance with the law of data protection (LOPD) 15/1999, and saving itself for works of investigation following the scientific method demanded in every case, it respected the Regulation (EU) of the European Parliament and of the Advice 2016/679 of April 27, 2016, relative to the protection of natural persons with regard to the processing of personal data and to the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation).

### 2.2 Instrument and Variables

Within the questionnaire, information was organized in 3 sections. A first section (25 items) included the sociodemographic profile: sex, age range, birthplace, weight before of confinement, weight variation, coexistence with other persons, place of residence during the confinement, position in the University; and for students, the faculty and degree program.

Dietary behaviours and physical activity habits were described in the second section (17 items) where questions about grocery shopping, change in consumption of fruit, vegetables, dairy products, pulses, fish/seafood, white meat, red meat and processed meat, pastries and snacks, rice/pasta/potatoes, nuts, alcohol drinks, sugary drinks, based on the healthy eating pyramid [32], portions of food, number of meals and physical activity over 30 minutes doing moderated or vigorous activity a minimum of 4 times during the week were included.

A third section included a semiquantitative questionnaire of adherence to the Mediterranean Diet (MD) (MEDAS-14) [33] and a validated questionnaire of Emotional Eating

“The emotional eater questionnaire Garaulet” (EEQ) [34]. MEDAS-14 was assessed on the continuous scale (0-14 points) classifying the participants into low (< 5 points), medium (6 to 8 points), and high (> 9 points) adherence levels [33], while EEQ, was assessed on the continuous scale (0-30 points) classifying the participants into non-emotional eater (0-5 points), low emotional eater (6-10 points), emotional eater (11-20 points), and very emotional eater (21-30 points) [34].

A pilot study was carried out among 15 subjects to verify the effectiveness of the questionnaire to learn if it provided the necessary information or if any of the questions needed to be modified.

### 2.3 Statistical Analysis

Normality distribution for quantitative variables was assessed using Shapiro-Wilk normality test. The quantitative variables were expressed as mean and standard deviation. Body mass index (BMI) was distributed using WHO ranges classification.

The following variables were regrouped to establish more robust results: MEDAS-14 (Low adherence and Medium/High), BMI (Under/Normal weight and Pre-obesity/Obesity I and II) EQQ (Non-emotional /Low emotional eater and Emotional /Very emotional eater).

For the quantitative variables, the Student’s test or non-parametric Mann-Whitney U test was used. Univariate comparisons were investigated between groups and explicative variables using the Pearson X2 test or non-parametric Fisher’s exact test for categorical data. The criterion of significance was established at  $p < 0.05$ . All computer data were analysed using “The jamovi project (2021). *jamovi*. (Version 1.8) [Computer Software]. Retrieved from <https://www.jamovi.org>.”

## 3. Results

### 3.1 Characterization of the sample population

A total of 170 completed questionnaires were received and two of them were eliminated because were the same data in all the answers as the previous one. Thus, 168 questionnaires were considered valid.

Two thirds (66.7%) of the participants were women, 79.2% from Spain, students (76.8%) and living in the family home (76.2%). The BMI, calculated with the weight prior the lockdown, showed that 7.1% were underweight, 66.1% of the sample had a normal weight, while the 26.8% were pre-obese or had some type of obesity.

Analysed by role, students were (79.8%), Research Professors (R.P) (14.9%) and Administrative Staff (A.S) (8.3%). Students were from the Faculty of Health and Science (65.9%), Faculty of Social and Humanity Sciences (27.1%) and Higher Polytechnic School (7%). The degree program with a greater number of students were Phycology (26.4%) followed by Human Nutrition and Dietetics (19.4%), Sport and Exercise Sciences (9.3%), Food and Sciences Technology (7.8%), Translation and Interpretation (7%), Advertising and Public relations (6.2%), Business Administration and Management (5.4%) and the others (18.7%). (Table 1 and 2).

**Table 1.** Sociodemographic characteristics Universtiy Population.

		Total N=168 (100%)
<b>Gender</b>		
	Women	112 (66.7%)

	Men	56 (33.3%)
<b>Birthplace</b>		
	Spain	133 (79.2%)
	Latin America	28 (16.7%)
	Europe	4 (2.4%)
	Others	3 (1.8%)
<b>Role</b>		
	Students	12 (76.8%)
	R.P	25 (14.9%)
	A.S	14(8.3%)
<b>Place of Residence</b>		
	Family home	128 (76.2%)
	Shared flat	19 (11.3%)
	Student residence	10 (6%)
	Alone	11 (6.5%)
<b>BMI (kg/m<sup>2</sup>)<sup>1</sup></b>		
	Underweight (<18.5kg/m <sup>2</sup> )	12 (7.1%)
	Normal weight (18.5-24.9kg/m <sup>2</sup> )	111 (66.1%)
	Pre-obesity (25-29.9kg/m <sup>2</sup> )	36 (21.4%)
	Obesity class I (30-34.9kg/m <sup>2</sup> )	8 (4.8%)
	Obesity class II (35-39.9kg/m <sup>2</sup> )	1 (0.6%)

<sup>1</sup> BMI: Body Max Index, expressed in kg/m<sup>2</sup>, using WHO classification. Research Professors (R.P) and Administrative Staff (A.S).

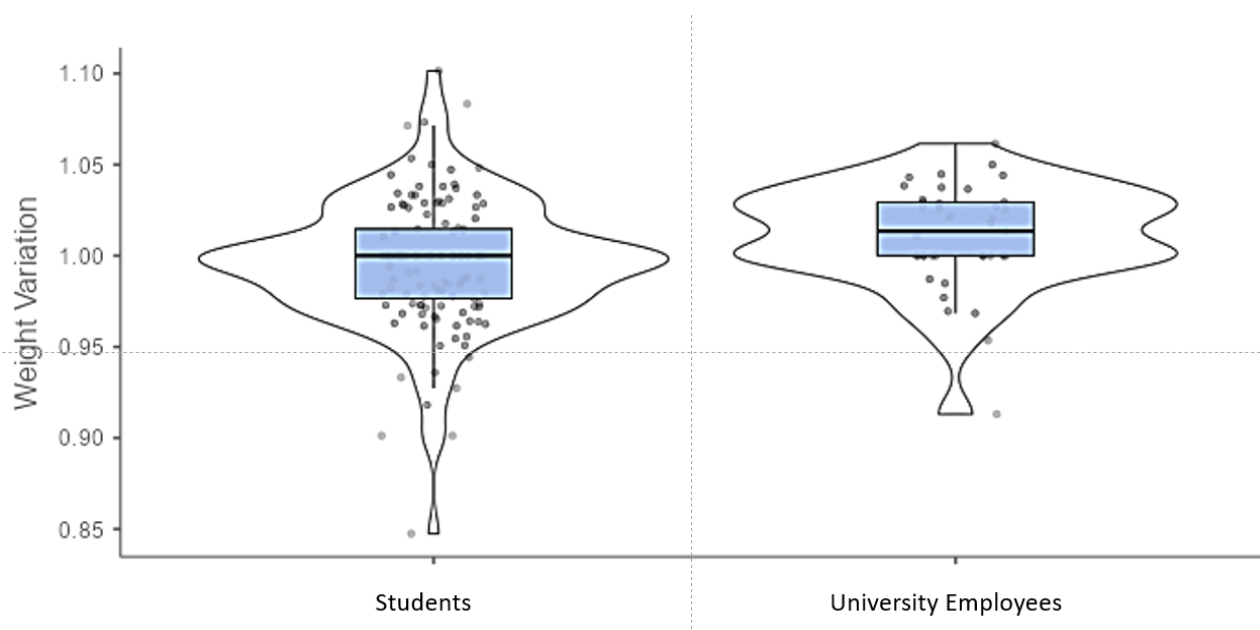
**Table 2.** Distribution of students for studies and faculties.

		Total N=129 (100%)
<b>Faculty</b>		
	Health sciences	85 (65.9%)
	Social and humanity sciences	35 (27.1%)
	Higher polytechnic school	9 (7%)
<b>Degree Program</b>		
	Phycology	34 (26.4%)
	Human Nutrition and Dietetics	25 (19.4%)
	Sport and exercise sciences	12 (9.3%)
	Food Sciences and Technology	10 (7.8%)
	Translation and interpretation	9 (7%)
	Advertising and Public relations	8 (6.2%)
	Business Administration and Management	7 (5.4%)
	Industrial Organisation Engineering	5 (3.9%)
	Journalism	5 (3.9%)
	Audiovisual Communication	4 (3.1%)
	Agro-Food Engineering	4 (3.1%)

Master Psychology	General Health	4 (3.1%)
Applied Languages		2 (1.6%)

To analyses weight's changes during the lockdown, it was determine using weight variation (weight increased in kg / weight before de confinement); 1 means that maintain the currently weight, <1 implicated a weight reduction and >1 weight gain. In general, our population maintain or increased weight (mean of  $0.99\pm 0.03$ ). Non statistically significant differences were found in weight variation comparing women ( $0.99\pm 0.03$ ) and men ( $0.99\pm 0.03$ ) ( $p=0.507$ ); comparing by country Spain ( $0.99\pm 0.03$ ) and others countries ( $1\pm 0.03$ ) ( $p=0.493$ ); comparing by place, living in family home ( $0.99\pm 0.03$ ), and non-family home ( $0.99\pm 0.04$ ) ( $p=0.833$ ); comparing by BMI, under/normal weight ( $1\pm 0.03$ ) and pre-obesity/obesity I and II ( $0.98\pm 0.04$ ) ( $p=0.104$ ); comparing by adherence to the MD, low adherence ( $1\pm 0.03$ ) and medium/high adherence ( $0.99\pm 0.03$ ) ( $p=0.752$ ); and finally comparing by Non-Emotional/Low emotional eater ( $0.99\pm 0.03$ ) and Emotional/Very emotional eater ( $1\pm 0.04$ ) ( $p=0.151$ ), using Mann-Whitney U test.

Specific for students, the analysis for the weight's change, non-statically significant differences were found, comparing if students were from the Degree of Human Nutrition ( $1\pm 0.03$ ) or others ( $0.99\pm 0.03$ ) ( $p=0.828$ ) and comparing by Faculty of Health Sciences ( $0.99\pm 0.03$ ) or others ( $0.99\pm 0.03$ ) ( $p=0.910$ ) using Mann-Whitney U test. However, considering the role, students ( $0.99\pm 0.03$ ) and University employees (Research Professor and Administrative Staff) ( $1.01\pm 0.02$ ), significant differences were found between the two groups ( $p<0.05$ ) using Mann-Whitney U test. (Figure 1)



**Figure 1.** Distribution of weight variation compared by role. Weight change is expressed in weight variation (weight increased during the lockdown in kg / weight before the lockdown in kg); 1 means that maintain the currently weight, <1 implicated a weight reduction and >1 weight gain. University Employees (Research Professor and Administrative Staff). Differences were evaluated by the Mann-Whitney U test ( $p<0.05$ ).

Students

To highlight how the lockdown affected the dietary behaviours of the population, the individuals were questioned about the changes in their habits and dietary pattern compared to the preceding period (Table 3).

During the lockdown, most of the evaluated population did the grocery shopping once or less per week (76.8%) and cooked more than usual (73.2%). Decreasing or stay the same the consumption of fruit (57.1%), vegetables (58.9%), dairy products (74.4%), pulses (73.2%), fish/seafood (76.8%), white meat (83.3%), red and processed meats (91.1%), pastries and snacks (78.6%), rice/pasta/potatoes (78.6%), nuts (83.9%) and low alcohol drinks (89.3%), spirits drinks (98%), sugary drinks (91.7), the number of meals (74.4%) and physical activity (63.7%).

Data was compared between students and University Employees, by the significant difference in the weight variation found between them. Significant differences were found on the consumption of vegetables, increasing a (20.1%) more in the group of students ( $p<0.05$ ); consumption of low alcohol drinks (wine and beer), increasing a (16.1%) more in the group of University Employees ( $p<0.05$ ); physical activity, increasing a (17.2%) more in the group of students ( $p<0.05$ ) (Table 3). Comparing by sex, significant differences were found, in women did the grocery 1 or less per week a (16%) more than men ( $p<0.05$ ); and women increased the consumption of fish/seafood (16.1%) more than men ( $p<0.05$ ), non-significant differences were found in the rest of questions (Table 4).

**Table 3.** Dietary and lifestyle adaptations during the confinement, compared by Students vs. University Employees (Research Professor and Administrative Staff).

	Total N =168 (100%)	Students N= 129	University Employees N=39	p-Value <sup>1</sup>
<b>How many times do you do the grocery shopping per week?</b>				
1 or less per week	129 (76.8%)	98 (76%)	31 (79.5%)	0.648
2 or more per week	39 (23.2%)	31 (24%)	8 (20.5%)	
<b>During the confinement, the consumption of fruits?</b>				
Has increased	72 (42.9%)	59 (45.7%)	13 (33.3%)	0.170
Has decreased or stay the same	96 (57.1%)	70 (54.3%)	26 (66.7%)	
<b>During the confinement, the consumption of vegetables?</b>				
Has increased	69 (41.1%)	59 (45.7%)	10 (25.6%)	<0.05
Has decreased or stay the same	99 (58.9%)	70 (54.3%)	29 (74.4%)	
<b>During the confinement, the consumption of dairy products?</b>				
Has increased	43 (25.6%)	35 (27.1%)	8 (20.5%)	0.407
Has decreased or stay the same	125 (74.4%)	94 (72.9%)	31 (79.5%)	

<b>During the confinement, the consumption of pulses?</b>				
Has increased	45 (28.8%)	37 (28.7%)	8 (20.5%)	0.313
Has decreased or stay the same	123 (73.2%)	92 (71.3%)	31 (79.5%)	
<b>During the confinement, the consumption of fish/seafood?</b>				
Has increased	39 (23.2%)	33 (25.6%)	6 (15.4%)	0.186
Has decreased or stay the same	129 (76.8%)	96 (74.4%)	33 (84.6%)	
<b>During the confinement, the consumption of white meat?</b>				
Has increased	28 (16.7%)	25 (19.4%)	3 (7.7%)	0.086
Has decreased or stay the same	140 (83.3%)	104 (80.6%)	36 (92.3%)	
<b>During the confinement, the consumption of red and processed meat?</b>				
Has increased	15 (8.9%)	13 (10.1%)	2 (5.1%)	0.342
Has decreased or stay the same	153 (91.1%)	116 (89.9%)	37 (94.9%)	
<b>During the confinement, the consumption of pastries and snacks?</b>				
Has increased	36 (21.4%)	31 (24%)	5 (12.8%)	0.135
Has decreased or stay the same	132 (78.6%)	98 (76%)	34 (87.2%)	
<b>During the confinement, the consumption of rice/pasta/potatoes?</b>				
Has increased	36 (21.4%)	31 (24%)	5 (12.8%)	0.135
Has decreased or stay the same	132 (78.6%)	98 (76%)	34 (87.2%)	
<b>During the confinement, the consumption of nuts?</b>				
Has increased	27 (16.1%)	23 (17.8%)	4 (10.3%)	0.259
Has decreased or stay the same	141 (83.9%)	106 (82.2%)	35 (89.7%)	
<b>During the confinement, the consumption of low alcohol drinks (wine and beer)?</b>				
Has increased	18 (10.7%)	9 (7%)	9 (23.1%)	<0.05
Has decreased or stay the same	150 (89.3%)	120 (93%)	30 (76.9%)	
<b>During the confinement, the consumption of spirits (vodka, gin, rum)?</b>				
Has increased	2 (1.2%)	2 (1.6%)	0 (0%)	0.434
Has decreased or stay the same	166 (98.8%)	127 (98.4%)	39 (100%)	
<b>During the confinement, the consumption of sugary drinks?</b>				
Has increased	14 (8.3%)	11 (8.5%)	3 (7.7%)	0.869
Has decreased or stay the same	154 (91.7%)	118 (91.5%)	36 (92.3%)	
<b>Do you cook more often during the confinement?</b>				
Yes	123 (73.2%)	92 (71.3%)	31 (79.5%)	0.313
No	45 (26.8%)	37 (28.7%)	8 (20.5%)	



<b>Have you increased the number of meals these days?</b>				
Has increased	43 (25.6%)	31 (24%)	12 (30.8%)	0.398
Has decreased or stay the same	125 (74.4%)	98 (76%)	27 (69.2%)	
<b>During the confinement, your physical activity?</b>				
Has increased	61 (36.3%)	52 (40.3%)	9 (23.1%)	<0.05
Has decreased or stay the same	107 (63.7%)	77 (59.7%)	30 (76.9%)	

<sup>1</sup>Differences between gender were evaluated by the Pearson Chi square test (p<0.05).

**Table 4.** Dietary and lifestyle adaptations during the confinement, compared by gender.

	<b>Total N =168</b>	<b>Women N= 112</b>	<b>Men N=56</b>	<b>p-Value<sup>1</sup></b>
<b>How many times do you do the grocery shopping per week?</b>				
1 or less per week	129 (76.8%)	92 (82.1%)	37 (66.1%)	<0.05
2 or more per week	39 (23.2%)	20 (17.9%)	19 (33.9%)	
<b>During the confinement, the consumption of fish/seafood?</b>				
Has increased	39 (23.2%)	32 (28.6%)	7 (12.5%)	<0.05
Has decreased or stay the same	129 (76.8%)	80 (71.4%)	49 (87.5%)	

<sup>1</sup>Differences between gender were evaluated by the Pearson Chi square test (p<0.05)..

### 3.3 Adherence to the MD (MEDAS-14) during the confinement

Analysing the adherence to de MD, during the confinement, (20.8%) of the individuals had a low level of adherence to DM, and Medium/High on the (79.2%) (Table 5).

Specifically, participants with a medium/high adherence to the MD during the confinement, were men (82.1%), born in Spain (84.2%) compared to Other Countries (60%) (p<0.05), students (79.8%), living in family home (82.8%) compared to non-family home (67.5%) (p<0.05), and by the BMI, in under/normal weight (<18.5-24.9kg/m<sup>2</sup>) (81.3%). Analysing for students, with a medium/high adherence, they were from the degree of Human Nutrition (96%) compared to other degrees (76%) (p<0.05) and from the Faculty of Health Science (80%) compared with other faculties (Table 6).

**Table 5.** Adherence to DM (MEDAS14) during the confinement, according to the sociodemographic characteristics of the population.

	<b>Total N=168 (100%)</b>	<b>Low N=35 (20.8%)</b>	<b>Medium/High N=133 (79.2%)</b>	<b>p-Value<sup>1</sup></b>

Gender					
	Women	112 (66.7%)	25 (22.3%)	87 (77.7%)	0.502
	Men	56 (33.3%)	10 (17.9%)	46 (82.1%)	
Birthplace					
	Spain	133 (79.2%)	21 (15.8%)	112 (84.2%)	<0.05*
	Other Countries	35 (20.8%)	14 (40%)	21 (60%)	
Students and university staff					
	Students	129 (76.8%)	26 (20.2%)	103 (79.8%)	0.694
	University Employees (R.Pans A.S)	39 (23.2%)	9 (23.1%)	30 (76.9%)	
Place of Residence					
	Family home	128 (76.2%)	22 (17.2%)	106 (82.8%)	<0.05*
	Non-family home (shared flat and student residence)	40 (23.8%)	13 (32.5%)	27 (67.5%)	
BMI (kg/m <sup>2</sup> )					
	Under/Normalweight(<18.5-24.9g/m <sup>2</sup> )	123 (73.2%)	23 (18.7%)	100 (81.3%)	0.260
	Pre-obesity/Obesity (25-39.9kg/m <sup>2</sup> )	45 (26.8%)	12 (26.7%)	33 (73.3%)	

<sup>1</sup>Differences of MEDAS-14, were evaluated by the Pearson Chi square test. Research Professors (R.P) and Administrative Staff (A.S)

**Table 6.** Adherence to DM (MEDAS14) during the confinement, according to degree and faculty.

		Total N=129 (100%)	Low N=26 (20.2%)	Medium/High N=103 (79.8%)	p-Value <sup>1</sup>
Degree					
	Human Nutrition	25 (19.4%)	1 (4.0%)	24 (96%)	<0.05*
	Other degrees	104 (80.6%)	25 (24%)	79 (76%)	
Faculty					
	Health Sciences	85 (65.9%)	17 (20%)	68 (80%)	0.951
	Other faculties	44 (34.1%)	9 (20.5%)	35 (79.5%)	

<sup>1</sup>Differences of MEDAS-14, were evaluated by the Pearson Chi square test (p<0.05).

### 3.4 Emotional eater behaviour during the confinement.

EEQ survey was used to evaluate the emotional relationship with the food intake during the lockdown. In our sample, most of the subjects were Non-emotional/Low Emotional eater (72.6%) compared to Emotional/Very emotional eater (27.4%).

The profile of the participant with an Emotional/Very emotional eater behaviour, during the confinement, were women (35.7%) compared to men (10.7%) (p<0.01), non-Spanish (40%) compared to Spanish (24.1%) (p=0.060), students (29.5%), living in no-family home (32.5%) and with Pre-obesity/Obesity (37.8%) compared to Under/Normal weight

(23.6%) ( $p=0.068$ ) (Table 7). According to the degree, University Employees of Human Nutrition (30.8%) and University Employees from the Faculty of Health Sciences (36.4%) (Table 8).

**Table 7.** EEQ during the confinement, according to the sociodemographic characteristics of the population.

		Total N=168 (100%)	Non-emotional /Low emotional eater N=122 (72.6%)	Emotional /Very emotional eater N=46 (27.4%)	<i>p</i> -Value <sup>1</sup>
<b>Gender</b>					
	Women	112 (66.7%)	72 (64.3%)	40 (35.7%)	<0.01
	Men	56 (33.3%)	50 (89.3%)	6 (10.7%)	
<b>Birthplace</b>					
	Spain	133 (79.2%)	101 (75.9%)	32 (24.1%)	0.060
	Others Countries	35 (20.8%)	21 (60%)	14 (40%)	
<b>Students and university staff</b>					
	Students	129 (76.8%)	91 (70.5%)	38 (29.5%)	0.272
	University Employees (R.P and A.S)	39 (23.2%)	31 (79.5%)	8 (20.5%)	
<b>Place of Residence</b>					
	Family home	128 (76.2%)	95 (74.2%)	33 (25.8%)	0.406
	Non-family home (shared flat and student residence)	40 (23.8%)	27 (67.5%)	13 (32.5%)	
<b>BMI (kg/m<sup>2</sup>)</b>					
	Under/Normalweight(<18.5-24.9g/m <sup>2</sup> )	123 (73.2%)	94 (76.4%)	29 (23.6%)	0.068
	Pre-obesity/Obesity (25-39.9kg/m <sup>2</sup> )	45 (26.8%)	28 (62.2%)	17 (37.8%)	

<sup>1</sup>Differences of EQQ, were evaluated by the Pearson Chi square test ( $p<0.05$ ). Research Professors (R.P) and Administrative Staff (A.S)

**Table 8.** EEQ during the confinement, according to degree and faculty.

		Total N=129 (100%)	Non-emotional /Low emotional eater N=91 (70.5%)	Emotional /Very emotional eater N=38 (29.5%)	<i>p</i> -Value <sup>1</sup>
<b>Degree</b>					
	Human Nutrition	25 (19.4%)	19 (76%)	6 (24%)	0.505
	Others	104 (80.6%)	72 (69.2%)	32 (30.8%)	
<b>Faculty</b>					
	Health Sciences	84 (65.6%)	63 (74.15)	22 (25.9%)	0.216

	Others	44 (34.4%)	28 (63.6%)	16 (36.4%)
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<sup>1</sup>Differences of EQQ, were evaluated by the Pearson Chi square test ( $p < 0.05$ ).

#### 4. Discussion

The spread of COVID-19 around the world forced governments to make very restrictive decisions[35]. In the case of Spain, a strict confinement of the entire population was imposed on March 14, 2020, which limited their mobility[4]. Being forced to stay indoors for a long-time can dramatically change our eating habits and physical activity practices. Lockdown was an unpleasant experience for everyone and, for those who lived alone[36]. Job uncertainty, loneliness, and fear about illness [37,38], adding the closure of the schools, work activities, social distance, and the ban of physical activities, radically disrupted the concept of normality [39,40]. In this work, we have analysed these modifications in a population sample from the university community of the Universidad Europea del Atlántico located in Santander, Cantabria, Spain. In our knowledge this is the first study that analysed in the college population differences among staff population and student's population.

Before the lockdown, the prevalence of overweight and obesity was 26.8%, being lower compared to the data reported for the Spanish population by Sánchez-Sánchez et al. [11] who found a 39.8% of incidence, and similar to the data reported by Sidor et al. [7] for the Polish population. It should be noted that in this case, the distribution of overweight and obesity also coincided with those of our sample. The incidence in our sample was also lower compared to the data reported for the Chilean (52.2%) [41] and the Dutch (55.6%) [42] populations. This may be due to the average age of our population because they are mostly made up of students. In general, weight variations were observed in the participants: 36.3% loss weight while a 35.7% gain weight with significant differences between students and University Employees. Weight loss was observed mostly in students than in University Employees ( $p < 0.05$ ) and didn't find correlation between BMI and weight gain/loss. Our results show a percentual lower weight gain in the population than those found in Sinisterra-Loaiza [29], Sidor et al [7] and Sánchez-Sánchez et al. [11], who reported a weight loss in obese people during the confinement and Di Renzo et al [28]. But is consistent with the weight gain reported in Celorio-Sardá et al [43]; Reyes-Olavarria et al [41] and Deschasaux-Tanguy et al [9]. It is interesting to note that no differences have been found between health science students and the rest of the university population.

Regarding the dietary and lifestyle adaptations during the lockdown in our populations the consumption of fruits, vegetables, dairy, pulses, fish/seafood, white meat, red and processed meat, pastries and snacks, rice/pasta/potatoes, nuts, low alcohol drinks, spirits and sugary drinks, number of meals per day and physical activity decreased or stay the same. The unique item was incremented was the frequency of cooking during confinement. These results are similar to those found by Rodríguez-Pérez et al [43] and contrary to that found by Sánchez-Sánchez et al [11], who reported an increase in the consumption of alcoholic beverages, and Celorio-Sardá et al [43] who reported an increased consumption in fruit, vegetables, legumes, fish, eggs and yogurt. We can conclude that most of our population did not change their eating habits during confinement, similar to the results found in 1932 Italian adults by Scarmozzino et al. [10], Brancaccio et al.[27], and Poelman

et al. [42] in 1030 Dutch adults. The diminution in the consumption of pastries and snacks is contrary to what was found in French population by Marty et al [8].

Because the significant difference found in the weight variation, we analysed differences between students/ University Employees in the dietary and lifestyle adaptations. Significant differences were found in vegetables (were students increased more the consumption), low alcohol drinks (were students decreased or stay the same more the consumption) and physical activity (were students increased it more) what is consistent with the results shown by Celorio-Sardá et al [43] who reported an increased consumption in vegetables and decreased consumption in fermented alcoholic beverages, especially in students.

Physical activity combined with a healthy diet is essential to achieve a beneficial health effect. During the confinement, the 36.3% of our population increased their physical activity. Our results are similar, although higher, to those reported by Rodríguez-Pérez et al. [44] and Di Renzo et al. [28] and somewhat lower than those found by Celorio-Sardá et al [43], contrary to those of Romero-Blanco et al. [45] who found that all groups increased their physical activity on average, while in our study significant differences were found between students and University Employees, with students being the ones who increased their physical activity practice in the highest percentage (40.3% vs 23.1%).

During the COVID-19 pandemic was recommended to follow the MD pattern due to its ability to stimulate the immune system [19,20]. According to Pérez-Araluce et al. [46] a better adherence to this pattern may be associated with a lower risk of COVID-19. MD, considered as a reference to a healthy balanced diet, is characterized by the intake of olive oil, fresh fruits, and vegetables [47] which are associated to the reduction of inflammatory stress markers, improvement in lipid profile, and insulin sensitivity. These effects are attributable to the phenolic compounds and mono and poly-unsaturated fatty acids it contains [20,48,49]. Our data show that the 79.2% of the population had Medium/High adherence to the MD (MEDAS-14) during the confinement; which is much higher than the 8% reported by Sánchez-Sánchez et al. [11] for the Spanish population. Comparing by role University Employees had the worst results, contrary to what was found by Rodríguez-Pérez et al.[44] and León-Muñoz et al.[49]. Our results could be explained by the fact that the youngest participants in our study majority belong to the Faculty of Health Sciences, where they are constantly encouraged to adopt a healthy lifestyle . Among the students, a significant difference was found with a greater adherence to the Mediterranean diet of the students of the Degree in Human Nutrition and Dietetics (96% Moderate / high adherence), which agrees with the data from Celorio-Sardá et al. [43], who found that nutrition students were the ones who most improved their eating habits during confinement.

The restrictions of confinement, explained above, have been linked to an increase in mental illness, especially depression and anxiety[50]. In this sense, different authors relate an increase in anxiety to emotional eating[51,52].

According to the results of the EEQ, most of the participants were categorized as non/low-emotional eaters (72.6%), similar to the data reported by López-Moreno M et al [53] for Spanish adults (67.2%). Women scored significantly higher than men as emotional/very emotional eaters (35.7% vs 10.7%) ( $p < 0.01$ ). Similar results were obtained by Di Renzo L et al. [39], who reported that women were more prone to emotional eating than men and no differences were found by age range groups. The social isolation imposed during the COVID 19 pandemic could pose a psychological burden for many individuals, but, for women, who continue to carry the burden of household chores in our current models of society, leading to eating more frequently or in greater quantity as a mechanism to cope with increasing fear and anxiety. It is known that during prolonged stress, our body releases cortisol, which increases the feeling of hunger [54].

This study has several limitations. The cross-sectional design does not provide any information on the possible casual nature. Our sample size is small to be a representative population and the distribution among genders and age range groups is inadequate. Besides, self-reported data are susceptible to biased information. The lack of a validated questionnaire can omit relevant information and raised the problem of generalization of results.

## 5. Conclusions

We can affirm that under the lockdown caused by the COVID-19, the UNEAT community decreased or stay the same dietary and lifestyle habits; students increased the intake of fruits and vegetables and physical activity compared with University Employees. Whereas University Employees during the lockdown increased more the intake of low alcohol drinks (wine and beer). As mentioned before, fruits and vegetables are the principal source of bioactive compounds that help maintain a state of health and could be a therapeutic approach to COVID-19.

In addition, our sample limited the consumption of pastries and snacks, sugary drinks, and alcoholic beverages, having a Medium/High adherence to the MD, and practiced physical exercise regularly. This has resulted in a reduction or maintenance of weight, especially in the youngest subjects in the community. In an exceptional situation as a pandemic scenario, it is difficult to establish a bidirectional relationship between foods and mods. In any case, in our sample, women were more likely to be emotional eaters than men, eating for other reasons than hunger, increasing the intake of more palatable foods.

Future strategies should be implemented to promote a balanced and healthy diet, especially improving the consumption of fruits and vegetables, together with the practice of physical activity, for the entire University population, and for the University Employees, who increased more weight during the lockdown.

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