eISSN 2255-0569

ORIGINAL

Lifestyle, overweight and obesity in spanish workers: related variables

Estilo de vida, sobrepeso y obesidad en los trabajadores españoles: variables relacionadas

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Received: 19 - V - 2022
Accepted: 10 - VI - 2022

doi: 10.3306/AJHS.2022.37.04.135

Abstract

Objective: To assess lifestyle habits related to diet and physical activity in workers and their impact on cardiovascular, metabolic and hepatic risk in relation to socio-demographic and occupational variables.
Design: Cross-sectional descriptive study in active labor forcé between March 2020 and June 2021. Site: occupational health services of the Balearic Islands.
Participants: 815 workers, aged 18-66 years, who attended regular health surveillance examinations in their companies. Interventions: Adherence to the Mediterranean Diet was estimated using the PREDIMED questionnaire and physical activity with the reduced IPAQ questionnaire. Regicor/Score was used to calculate cardiovascular risk and the online calculator for metabolic syndrome. The risk of hepatic repercussion was assessed with the Fatty Liver Index (FLI).
Results: There are greater adherence to MedDiet in women (56.89%) and greater physical activity in men (57.8%). Physical activity was related to improvement in all indicators of obesity and adiposity in men. In women only with body mass index and body fat ($p < 0.0001$). All sociodemographic variables showed a relationship with physical activity performed ($p < 0.0001$) but not with adherence to the MedDiet.
Conclusion: MedDiet adherence is higher in women and physical activity in men with an impact on BMI, but not on CVR or metabolic syndrome. Body fat is the adiposity parameter most correlated with physical activity in both sexes. Social class I and II and non-manual work were related to higher physical activity.

Key words: Mediterranean diet, physical activity, cardiovascular risk, metabolic syndrome.

Resumen

Objetivo: Evaluar los hábitos de vida relacionados con alimentación y actividad física en trabajadores y su impacto en el riesgo cardiovascular, metabólico y hepático relacionándolos con variables sociodemográficas y laborales.
Diseño: Estudio descriptivo transversal en trabajadores en activo laboralmente desde marzo 2020-junio de 2021. Emplazamiento: servicios de salud laboral de Islas Baleares.
Participantes: 815 trabajadores, entre 18-66 años que acudieron a los exámenes periódicos de vigilancia de la salud de sus empresas. Intervenciones: Se estimó la adherencia a la Dieta Mediterránea mediante el cuestionario PREDIMED y la actividad física con el cuestionario reducido IPAQ. Para el cálculo de Riesgo cardiovascular se utilizó Regicor/Score, y para el síndrome metabólico la calculadora on line. El riesgo de repercusión hepática se valoró con el índice de hígado graso (FLI).
Resultados: Mayor adherencia a MedDiet en mujeres (56,89%) y mayor actividad física en hombres (57,8%). Se observa mejora con la actividad física en todos los indicadores de obesidad y adiposidad en hombres. En mujeres sólo con el IMC y la grasa corporal ($p < 0,0001$). Todas las variables sociodemográficas mostraron relación con la actividad física realizada ($p < 0,0001$), no con la adherencia a MedDiet.
Conclusión: La adherencia MedDiet es mayor en mujeres y la actividad física en hombres con impacto en el IMC, pero no en RCV o Síndrome metabólico. La grasa corporal es el parámetro de adiposidad que más se correlaciona con la actividad física en ambos sexos. La clase social I y II y el trabajo no manual se relacionaron con mayor actividad física.

Palabras clave: Dieta mediterranea, actividad física, riesgo cardiovascular, syndrome metabólico.

Introduction

More than three hundred years ago, Bernadino Ramazzini made certain observations on the relationship between health problems, work habits and lifestyle. These observations are still valid, especially after the COVID-19 outbreak, we highlight his findings on risk prevention, health promotion and the influence of unhealthy lifestyle habits. Besides it is not easy to evaluate and compare studies performed at different times, the study of the relationship between past and current practices should encourage the implementation of improvements in this field[1].

An unhealthy lifestyle, apart from generating health problems, can also have a negative impact on the workplace: sickness leave, loss of productivity and reduced working capacity. Programs oriented on health promotion in the workplace are aimed to improve workers' health, but tend to minimize these negative consequences and the overall assessments of the effectiveness of these programs are hindered by a high degree of heterogeneity in interventions and study populations[2].

The adherence to the mediterranean diet (MedDiet) and physical activity (PA) are associated with beneficial effects on preventing cardiovascular diseases by reducing the risk of hepatic steatosis in subjects with Metabolic Syndrome (MetS) and obesity[3].

A fundamental part of a healthy lifestyle is based on the definition of what constitutes a varied healthy diet, which continuously changes. Scientific evidence supports that the intake of certain types of nutrients, specific groups of foods or general dietary patterns positively affects health and promotes the prevention of common non-communicable diseases. MedDiet is rich in plant-based foods, including fresh fruits and vegetables, whole grains, legumes, seeds and nuts; and with a smaller amount of animal origin meats, in particular fatty and processed meats. This diet demonstrated its effectiveness on preventing diseases, especially cardiovascular diseases, and positively affecting the overall health[4].

The 2020 WHO guidelines support PA as a healthy lifestyle, with the addition of the following statements: a) any quantity of PA is better than nothing, b) an increased PA promotes an optimal health and c) it is recommended to reduce sedentary habits[5].

The aim of this work is to analyze the lifestyle habits of Spanish workers during the pandemic in terms of food intake and PA, and their relationship with the following parameters: cardiovascular risk (CVR), MetS, fatty liver, obesity, and socio-demographic variables.

Method

A descriptive cross-sectional study was performed in a sample of 815 Spanish workers (481 males and 334 females), aged between 18 and 66 years from a total population of 1028 workers, of which 76 were excluded due to not satisfying the criteria and 137 that refused to participate. Occupational doctors from the participating companies of the services sector of the Balearic Islands collected the data during the regular health surveillance examinations performed between March 2020 and June 2021. Participation was voluntary with an informed consent to use the results for epidemiological purposes. Were inclusion criteria: being active in the company and not being under treatment for previous cardiovascular disease or having uncontrolled or compensated cardiovascular risk factors.

The Ethics Committee for Clinical Research of the Health Area of the Balearic Islands (IB 4383/20) approved the current study.

In order to determine weight and height, a SECA 700 scale and SECA 220 telescopic measuring device incorporated in the scale were used. The body mass index (BMI) ranges taken into account were the ones defined by the WHO. Being normal weight when the BMI is below 25; overweight when the BMI is equal or above 25 and below 30; obese class I when the BMI is equal or above 30 and below 40; and obese class II when the BMI is equal or above 40[6].

The hip and waistline perimeters were determined with a SECA 20 measuring tape, with a measuring range from 1 cm to 200 cm, divided on a millimetric scale. The TANITABC-420MA analyzer was used to determine body composition, estimating the percentage of body fat and visceral fat. The ranges for the waist circumference (WC) were considered normal in men when below 94 cm and below 80 cm in women. Waist to hip ratio (WHR) index was considered normal in men when below 0.94 and below 0.84 in women. The waist to height ratio (WtHR) was considered normal for both sexes when below <0.5. Total body fat percentage (TBF%) was considered normal for both sexes when below 20% and visceral fat (VF) was considered normal in men when below 20 and below 30 in women[7,8].

Social and occupational variables included in the study were as follows:

Age: Due to the sample size and taking into account that cardiovascular maturity is reached at 40 years old and cardiovascular decline starts at 50, individuals were classified under three different groups: between 18 and 39 years, between 40 and 50 years, and between 51 and 66 years.

Sex: A categorical variable, with individuals classified as male or female.

Social class and type of work: Determined on the basis of the National Classification of Occupations of the year 2011 (CNO-11) and on the basis of the proposal made by the Group of Social Determinants from the Spanish Society of Epidemiology[9]. For statistical analysis purposes, a reduced classification with three categories was defined from the original seven categories:

- Class I. Directors/managers, college professionals, sportsmen and artists.
- Class II. Intermediate occupations and self-employed persons without employees.
- Class III. Unskilled workers.

Type of work: manual (blue collar) and not manual (white collar).

Study level: according to the current education system in Spain and classified in three categories:

- Elementary school: consisting of six basic levels, from first to sixth grade of primary school.
- Intermediate: compulsory secondary education, with two cycles. The first cycle ranged from the first to third course, and the second cycle consisting of the fourth course.
- Superior: completed university degrees or superior vocational education, in any of the forms established and in accordance with the legislation in force when completed.

Workplace characteristics: i) manual handling of loads (MHL) and vehicle driving (at least 1/3 of the working day) and ii) sedentary work (seated at least 50% of the working day).

Cardiovascular risk (CVR) was calculated by using the Score and REGICOR tables[10,11], as these standards are available for the Spanish population and being the REGICOR the only one validated for the aforementioned population.

The presence of metabolic syndrome (MetS) was determined with an online multiplatform application, based on the ATP-III definition, validated in Spanish patients and taking into account the following variables: gender, abdominal perimeter, triglycerides, maximum and minimum blood pressure and basal glycaemia[12].

Fatty liver was estimated with the fatty liver index (FLI) calculator, algorithm based on PCi, BMI and triglyceride and γ-glutamyltransferase levels[13].

The assessment of dietary habits was evaluated with the validated PREDIMED survey of adherence to the Mediterranean diet (MedDiet)[14,15].

The reduced IPAQ validated survey was used to assess healthy living habits in terms of PA[16,17].

Statistical Analysis

A descriptive analysis of the categorical variables was made by calculating their frequencies and distributions. Regarding quantitative variables, the statistical analyses included calculations of means and standard deviations (SD) and in the case of qualitative variables, their percentages. Bivariant association analyses were carried out with the Chi-squared test (when required, data was corrected with Fisher's exact test), Student's t-test was used for independent samples and the Cohen Kappa test was used to assess the concordance between the different scales. Multivariant analyses were carried out with mutinomial logistic regressions.

Data were analyzed using the Statistical Package for the Social Sciences version 27 (SPSS Inc, Chicago), considering a p-value below 0.05 as statistically significant.

Results

The characteristics of the population sample are shown in **table I**, with a mean of 48 year old population, with men presenting higher BMI values and being classified as overweight; as well, all their adiposity indicators were higher (waist circumference, waist to height ratio, total body fat and visceral fat). There were no significant differences in the educational level between men and women. Concerning the social class and type of work, social class III and manual work was predominant in both sexes, but being significantly higher in men. There are significant differences observed in the characteristics of the workplace depending on the sex: vehicle driving with manual handling of loads (MHL) was predominant in male population, while women were majorly sedentary. There was a significant greater adherence to the MedDiet in women with; on the contrary, the level of PA was higher in men.

Regarding the diet content, the overall consumption of olive oil, butter, vegetables, nuts, fish and white meat was higher in women. Men reported higher consumption of rice and pasta, wine, soft drinks, red meat, fruits and vegetables (**Table II**).

PREDIMED assessment analyses revealed that there are no significant relationships between the MedDiet adherence and the following variables: adiposity and obesity parameters, cardiovascular risk, metabolic syndrome and fatty liver (**Table III**). However, and depending on the sex, significant relationships were observed between the degree of PA and the studied variables: in men, an increase of PA revealed a decrease in all adiposity and obesity parameters (overweight and obese BMI values, high total body fat, high visceral fat, high waist to height ratio and high waist to hip ratio). While in women, an increase of PA reduced their BMI values and total body fat (**Table IV**).

There were no significant relationships between the degree of adherence to the MedDiet and the socio-demographic variables, except in sex, where women showed a greater adherence to the MedDiet. Regarding the level of PA, significant differences were found in all sociodemographic parameters, with higher levels of PA in men, young people, with elementary studies, social class III and manual occupations (**Table V**).

As well, a significant relationship was observed between the type of occupation and the adherence to the MedDiet depending on the sex: being higher in women than in men. Likewise, women have a higher adherence to the MedDiet, regardless the nature of the job performed (sedentary/non-sedentary; with and without vehicle driving and MHL). Regarding PA, no significant relationship between PA and occupational characteristics were found in any case (**Table VI**).

Discussion

This study shows the degree of the adherence to the MedDiet and PA during the COVID-19 pandemic, being the first one quantified through the PREDIMED survey, and the most recent one with the reduced IPAC questionnaire. Significant differences were found between men and women: in terms of diet, women showed a greater adherence to the MedDiet both qualitatively and quantitatively, while men revealed to perform higher levels of PA.

Men and women show substantial differences, not only in terms of somatometric characteristics, but also in social conditions such as socioeconomic level and occupational variables. These circumstances make difficult to compare this population and skew the aforementioned results.

Table I: Characteristics of the Study Population. Comparison between sex.

Variable	Male (N = 481)	Female (N = 334)	P
Anthropometric and adiposity variables: mean (SD)			
Age	48.25 (8.35)	48.89 (8.16)	0.277
Weight	82.79 (13.93)	67.97 (11.98)	**<0.001**
Height	173.42 (6.81)	160.72 (5.98)	**<0.001**
BMI	27.49 (4.01)	26.33 (4.47)	**<0.001**
Waist	94.61 (10.96)	84.35 (11.43)	**<0.001**
Waist/height	0.55 (0.06)	0.53 (0.07)	**<0.001**
Hip	106.22 (58.83)	99.00 (10.13)	0.027
Waist/Hip	0.92 (0.07)	0.85 (0.06)	**<0.001**
Total body fat	24.70 (6.58)	36.08 (7.78)	**<0.001**
Visceral fat	11.35 (4.53)	7.53 (2.65)	**<0.001**
BMI classification (%)			
Normal	29.11	41.62	**<0.001**
Overweight	48.86	39.52	
Obesity	22.04	18.86	
Study level (%)			
Elementary	49.06	41.92	0.116
Intermediate	32.43	35.63	
Superior	18.50	22.46	
Social class and type of work (%)			
Class I	3.33	2.40	**<0.001**
Class II	20.58	36.83	
Class III	76.09	60.78	
Type of work (%)			
Non-manual work	23.91	39.22	**<0.001**
Manual work	76.09	60.78	
Workplace characteristics (%)			
sedentary work	25.16	41.92	**<0.001**
(seated > 50% working day)			
Driving of vehicles and MHL	71.93	53.29	**<0.001**
(at least 1/3 of the working day)			
Healthy lifestyle: MedDiet -PREDIMED	43.87	56.89	**<0.001**
High MedDiet adherence			
Healthy lifestyle: PA IPAQ			
Low exercise	1.87	3.29	0.041
Moderate exercise	40.33	47.31	
High exercise	57.80	49.40	

Values of p<0.05 are considered significant.

Table II: MedDiet adherence results (PREDIMET survey): total and partial.

Total results (%)		Males	Females	P
MedDiet adherence				
High adherence		43.87	56.89	<0.001
Low adherence		56.13	43.11	
Partial results (%)				
Survey items				
Olive oil use	yes	97.30	97.60	0.668
	no	2.70	2.40	
Olive oil quantity (spoons / day)	2 or more	89.60	94.31	0.030
	< 2	10.40	5.69	
Vegetables (Portions / day)	2 or more	36.59	60.68	<0.001
	< 2	63.41	39.22	
Fruits (Pieces / day)	3 or more	28.27	23.34	0.010
	<3	71.73	67.66	
Red meat (per day)	1 or more	3.95	2.40	<0.001
	<1	96.05	97.60	
Butter (per day)	1 or more	2.91	4.49	0.021
	<1	97.09	95.51	
Soft drinks (per day)	1 or more	17.46	8.38	<0.001
	<1	82.64	91.62	
Wine consumption (per week)	3 or more	9.56	3.29	<0.001
	<3	90.44	96.71	
Legumes (days / week)	3 or more	20.58	17.07	0.024
	<3	79.42	82.93	
Fish (days / week)	3 or more	28.27	34.73	0.033
	<3	71.73	65.27	
Industrial pastry (days / week)	3 or more	23.28	17.66	0.010
	<3	73.72	82.34	
Nuts (days / week)	1 or more	76.51	79.34	0.087
	< 1	23.49	20.66	
Other non-red meats (per week)	yes	95.63	97.01	0.112
	no	4.37	2.99	
Rice, pasta, lightly fried	2 or more	92.10	88.92	0.052
	< 2	7.90	11.08	

p<0.05 values are considered significant. PREDIMED questionnaire: < 9 low adherence >= 9 good adherence.

Table III: Relationship between MedDiet adherence and physical activity with high scores prevalence, CVR, MetS and FLI indicators.

Relationship between MedDiet adherence and MetS, CVR and FLI							
	Females				**Males**		
	Low n = 144	**High n = 190**	**P**		**Low n = 270**	**High n = 211**	**P**
MetS	18.06	15.79	0.595		22.22	18.96	0.197
High SCORE	6.03	9.82	0.011		36.48	45.20	0.156
High REGICOR	4.31	5.71	0.007		16.81	16.76	0.945
High risk FLI	13.89	11.64	0.758		34.81	28.71	0.165
Relationship between level of physical activity (IPAC survey) and MetS, CVR and FLI							
	Females				**Males**		
	Low n = 11	**Moderate n = 158**	**High n = 165**	**P**	**Low n = 9**	**Moderate n = 194**	**High n = 278**	**P**
MetS	27.27	21.02	12.12	0.161	44.44	27.98	15.16	0.006
High SCORE	9.09	9.56	7.04	0.671	11.11	43.43	38.94	0.009
High REGICOR	0.00	7.25	3.52	0.344	0	16.57	17.62	0.033
High risk FLI	19.18	14.65	10.30	0.010	33.33	39.38	27.08	0.010

MetS = Metabolic syndrome; CVR = Cardiovascular risk; FLI = Fatty liver index
It was considered high Score risk ≥ 5% and Framingham-REGICOR ≥10%. Metabolic syndrome (MetS) presence was positive with three or more altered parameters. Fatty liver value <30 is considered low probability and>60 is considered indicative of high steatosis risk.
Values of p<0.05 are considered significant.

Additional studies on the current subject have shown variable outcomes as well.

Some studies suggest that the adherence to the MedDiet increased slightly during the confinement, but also raised the consumption of non-healthy food. Also, the number of people that practice PA decreased, along with its weekly dedication[18].

Equivalent studies in terms of occupational health within a pandemic context obtained similar results, reassuring the idea that both PA and a healthy diet are key factors to avoid the main non-communicable diseases. During the confinement, workers were more likely to develop sedentary behaviors; however, this conduct was easier to revert if there was a health promotion program in the workplace that encouraged a moderate increase of PA.

Concerning the diet, health promotion programs and remote working also had positive effects by increasing the adherence to the MedDiet in working population, which highlights the relevance of this kind of programs in this population[19].

Likewise, additional studies conducted during the pandemic showed an increased adherence to the MedDiet, although no significant changes were reported in terms of BMI[20].

Table IV: Lifestyle relationships between food intake, physical activity, and adiposity indicators.

Relationship between MedDiet adherence with obesity parameters and adiposity indicators (%)						
	MedDiet adherence					
	Males			**Females**		
	High n = 211	**Low n = 270**	**P**	**High n = 190**	**Low n = 144**	**P**
BMI overweight/obesity	68.72	72.59	0.500	57.36	59.72	0.849
High body fat	71.90	79.18	0.178	71.58	85.07	0.072
High visceral fat	54.76	59.48	0.576	11.58	12.50	0.463
High waist to height ratio	75.36	80.37	0.113	60.00	60.42	0.515
High waist to hip ratio	31.28	38.89	0.040	57.89	56.94	0.475
Relationship between level of physical activity with obesity parameters and adiposity indicators (%)						
	Physical activity					
	Males			**Females**		
	High n = 203	**Moderate-low n = 278**	**P**	**High n = 165**	**Moderate-low n = 169**	**P**
BMI overweight/obesity	64.75	79.31	<0.001	60.61	65.09	0.024
High body fat	67.74	86.14	<0.001	65.45	84.02	<0.001
High visceral fat	49.10	68.81	<0.001	10.30	13.69	0.223
High waist to height ratio	70.86	88.18	<0.001	56.36	63.91	0.097
High waist to hip ratio	30.94	41.87	0.009	55.15	59.76	0.229

p<0.05 values are considered significant. PREDIMED questionnaire: < 9 low adherence >= 9 high adherence. IPAC: moderate physical activity at least 600 METs and high physical activity at least 3000 METs.

Table V: Relationships between diet and physical activity with sociodemographic variables: sex, age, study level, social class, occupation.

Relationship between MedDiet adherence and sociodemographic variables					
Sociodemographic variables		**MedDiet adherence (%)**			
		n	**High**	**Low**	**P**
Sex	Male	481	43.87	56.13	**<0.001**
	Female	334	56.88	43.12	
Age	18-39 years	129	13.72	17.87	0.075
	40-49 years	270	31.42	34.78	
	50-66 years	416	54.86	47.34	
Study level	Elementary	376	42.89	49.28	0.062
	Secondary	275	37.66	29.95	
	Higher education	164	19.45	20.77	
Social class	Class I	24	2.74	3.14	0.643
	Class II	222	28.68	25.85	
	Class III	569	68.58	71.01	
Occupation	Non-manual	246	31.42	28.99	0.248
	Manual	569	68.58	71.01	
Relationship between level of physical activity and sociodemographic variables					
Sociodemographic variables		**Physical activity (%)**			
		n	**High**	**Moderate-low**	**P**
Sex	Male	481	57.80	42.20	0.011
	Female	334	49.40	50.60	
Age	18-39 years	129	63.57	36.43	0.034
	40-49 years	270	55.56	44.44	
	50-66 years	416	50.72	49.28	
Study level	Elementary	376	59.57	40.43	0.007
	Secondary	275	52.73	47.27	
	Higher education	164	45.12	54.88	
Social class	Class I	24	25.00	75.00	**<0.001**
	Class II	222	30.18	69.82	
	Class III	569	65.03	34.97	
Occupation	Non-manual	246	29.67	70.33	**<0.001**
	Manual	569	65.03	34.97	

p<0.05 values are considered significant. PREDIMED questionnaire: < 9 low adherence >= 9 high adherence. IPAC: moderate physical activity at least 600 METs and high physical activity at least 3000 METs.

In this work, a link between the practice of PA and an improvement of adiposity indicators and BMI were observed, but no association was found with an increased adherence to the MedDiet.

Concerning the sociodemographic variables analyzed, there were no significant differences in terms of adherence to the MedDiet, except in sex, with greater adherence in women. On the contrary, the practice of PA showed statistical differences in all sociodemographic variables, with higher levels of exercise in young men, with elementary studies, belonging to a social class III and performing manual jobs. These findings contrast with earlier studies that suggest a positive relationship between the adherence to the MedDiet and higher social classes, with less adherence in lower socioeconomic levels[21].

Although the results of previous studies on this subject are variable, the beneficial effects of the MedDiet as a healthy diet and lifestyle is widely accepted. The differences seen between these studies can be explained by the variability of the alimentary systems in different parts of the world[22]. Therefore, additional multidisciplinary studies are needed to evaluate the sustainability of the MedDiet that include the aforementioned aspects[23].

Given that, the MedDiet has been revised in a simplified framework in order to adapt it to different nutritional and socioeconomic contexts of the Mediterranean region, by considering socioeconomical challenges, lifestyle, diet, environment and health population, and therefore, compiling these updated recommendations.

The new concept of "main meals" was introduced to reinforce the vegetal component of the dietary pattern, frugality and moderation is emphasized due to the public health challenge that obesity represents. As well, cultural and lifestyle elements such as coexistence, culinary habits, PA, adequate rest, proportion and frequency of food intake are considered. These new recommendations comprise additional factors such as seasonality, biodiversity, local, traditional and organic products availability. Thus, the MedDiet has been recognized as Intangible Cultural Heritage of Mankind by the UNESCO in 2010, taking into account its contribution to health and general well-being, adapted to the current reality with a new graphic representation[24].

In contrast, in the context of the COVID-19 pandemic, some authors examined the association between regional adherence to a MedDiet and COVID-19 cases and deaths by using an ecological study design, emphasizing that the adherence to the MedDiet was negatively associated with both COVID-19 cases and related deaths in 17 regions of Spain. This association remained valid when adjusted with welfare factors. Similarly, a negative association was found between the adherence to the MedDiet and COVID-19-related deaths in 23 countries, when adjusted with welfare and physical inactivity. The anti-inflammatory properties of MedDiet, probably due to its content of polyphenols, may be a biological basis that explains these findings. However, there are still confounding factors unrelated with dietary aspects that caused COVID-19 cases and related deaths that should be explored in future cohort studies[25].

Adult Spanish population, especially young adults, students and highly active individuals declared that they decreased their PA during the COVID-19 confinement[26]. This work opens new comparative options once the pandemic era ends, in order to evaluate the modified lifestyle habits of this population.

Table VI: Relationship between diet and physical activity with occupation characteristics.

Relationship between MedDiet adherence and occupation									
Occupation characteristics	**High adherence**				**Low adherence**				**P**
	Males		**Females**		**Males**		**Females**		
	n	**(%)**	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	
Non sedentary > 50%	154	42.78	114	58.76	206	57.22	80	41.24	**<0.001**
Sedentary > 50%	57	47.11	76	54.29	64	52.89	64	45.71	
Non-driving and MLH	55	40.74	81	51.92	80	59.26	75	48.08	**<0.001**
Driving and MHL	156	45.09	109	61.25	190	54.91	109	38.76	
Relationship between level of physical activity and occupation									
Occupation characteristics	**High**				**Moderate-low**				**P**
	Males		**Females**		**Males**		**Females**		
	n	**(%)**	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**	
Non sedentary > 50%	239	66.39	130	67.01	121	33.61	64	32.99	0.132
Sedentary > 50%	39	32.23	35	25	82	67.77	105	75	
Non-driving and MLH	51	37.78	50	32	84	62.24	106	67.95	0.258
Driving and MHL	227	65.61	114	64.61	119	34.39	63	35.39	

MHL: Manual handling of loads. p<0.05 values are considered significant. PREDIMED questionnaire: < 9 low adherence >= 9 high adherence. IPAC: moderate physical activity at least 600 METs and high physical activity at least 3000 METs.
Values of p<0.05 are considered significant.

Due to the confinement period of the COVID-19 pandemic, some authors have reviewed the studies that explored the health impacts of several weeks of reduction in PA and daily step count, combined with altered eating habits. These studies identified an increased resistance to insulin, total body fat, abdominal fat and inflammatory cytokines as some of the main metabolic consequences. All these factors have been strongly associated with the development of metabolic syndrome, which in turn increases the risk of multiple chronic diseases[27].

In the present work, the adherence to the MedDiet has not shown any substantial relationship with adiposity parameters, nor with CVR or MetS. On the contrary, there were differences observed in terms of the level of PA (assessed through IPAQ), with a significant relationship between increased exercise level of PA and improved indicators of obesity and adiposity, especially in men.

Conclusions

The adherence to the MedDiet, assessed with the PREDIMED survey, showed a higher adherence in women in the population studied, while the PA assessed through the IPAQ questionnaire, showed greater levels of moderate to high PA in men. Social class and type of work were related with levels of PA, but not with the adherence to the MedDiet. Likewise, the level of PA was associated with obesity and adiposity indicators, especially in men.

The adherence to the MedDiet and the practice of PA showed an important relationship with cardiovascular risk, decreasing its prevalence when a healthy diet was adopted and moderate to high levels of PA are performed.

Working age people spend much of their time at work. Therefore, we highlight the importance of developing health promotion programs at the workplace, aimed to encourage an appropriate lifestyle mainly focused on encouraging heart-healthy diets and an increase of PA.

Funding
This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Conflict of interest
Authors do not have any conflict of interest to declare.

What is known on the topic
Lifestyle in diet and exercise have been modified during the COVID-19 pandemic period.

Unhealthy lifestyle habits may generate cardiometabolic risks and increase the risk of overweight and obesity.
The joint study of BMI and adiposity indicators complements the definition of obesity.

What this study contributes:
The assessment of dietary and exercise habits by means of valid surveys facilitates action in risk prevention.

Adherence to the Mediterranean diet has less impact on cardiometabolic risk and hepatic repercussions rather than moderate-high physical activity, but complements it.

There are differences between men and women in lifestyle and its cardiovascular and obesity repercussions.

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