

# Adherence to the Mediterranean diet and cardiovascular risk factors in Sicily, southern Italy

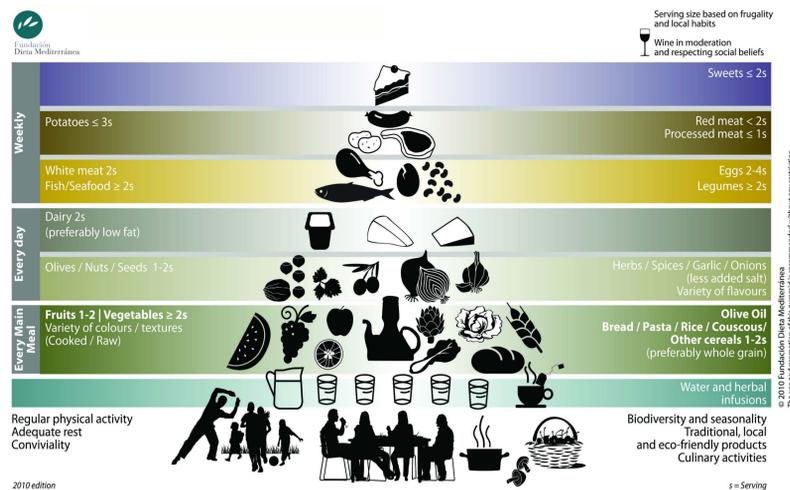


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## BACKGROUND

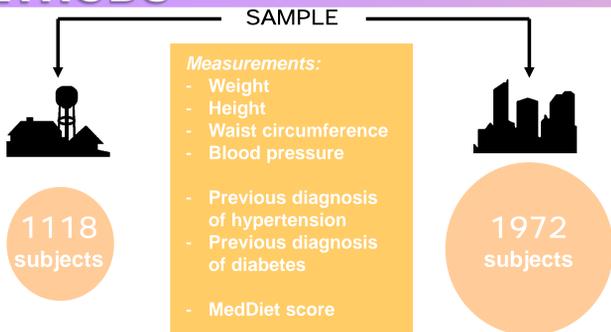
There are numerous indications that the adoption of the Mediterranean dietary pattern is associated with decreased all-cause mortality and improvements in cardiovascular risk factors (1). The Mediterranean diet is an eating pattern that successfully combines pleasant taste with positive health effects. This dietary pattern represents a set of healthy dietary habits including high consumption of vegetables and fresh fruits, legumes, fish, cereals, and nuts, with olive oil as the main source of fat. The high intake of fiber and monounsaturated fatty acids, low intake of trans fatty acids from meat and sweets, and a moderate intake of alcohol, suggest that this dietary pattern can protect against diabetes by improving lipid profiles, glycemic control and insulin sensitivity (2,3). The benefits of the Mediterranean diet have been also attributed to control of blood pressure levels, markers of systemic chronic inflammation, and platelet aggregation (4). The phenomenon of nutrition transition is mainly considered responsible for the on-going trends toward the increasing incidence of overweight and obesity especially among population of the southern countries of Europe (6).



## AIM

Studying nutrition and lifestyles habits in the context of closed environments such islands is interesting in order to assess if differences among more rural areas compared with industrialized and urbanized areas still exist. In spite of several epidemiological studies that have evaluated the adherence to Mediterranean diet in Europe, to our knowledge, few approaches have tested the adherence to the Mediterranean diet specifically in the islands sited in the Mediterranean Basin, mainly in Spanish, Greek and Cypriot populations. Concerning Sicily, an island in the South of Italy and the biggest of the entire Mediterranean Basin, there are no specific information of food consumption and nutrition transition, from the traditional Mediterranean type of diet to the western diet, and the only available data for Sicilian dietary habits are from multicentric surveys. Thus, the aim of this study was to assess the adherence to the Mediterranean dietary pattern of the general population recruited in two urban and rural areas of Sicily, and to assess its potential association with some well-known cardiovascular risk factors such obesity, diabetes, and hypertension.

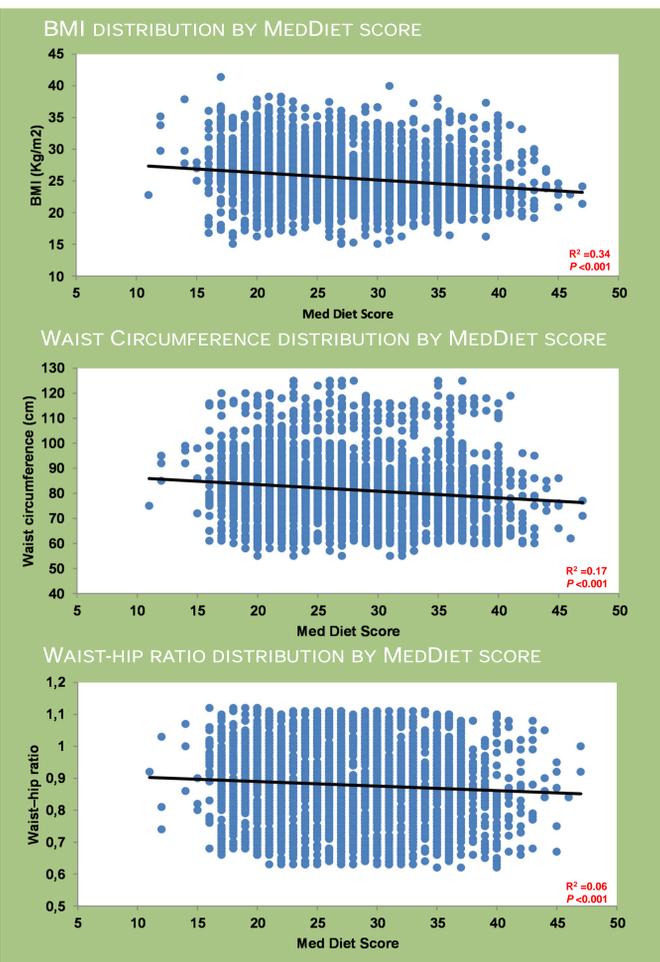
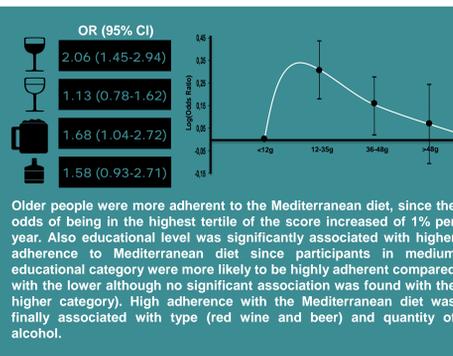
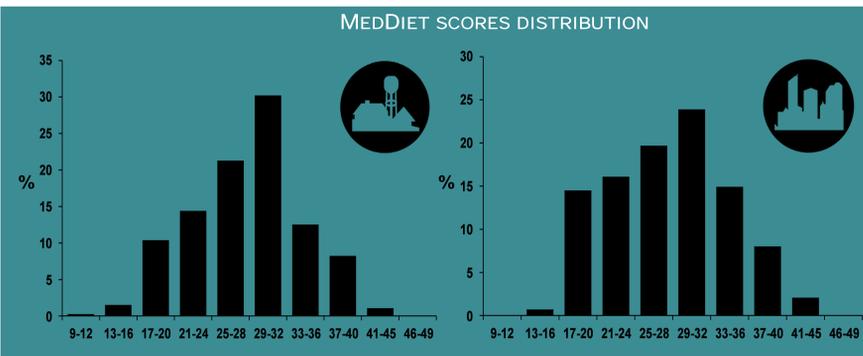
## METHODS



### MEDDIET SCORE

	FREQUENCY OF CONSUMPTION (SERVINGS/MONTH)					
	NEVER	1-4	5-8	9-12	13-18	>18
NON-REFINED CEREALS (WHOLE GRAIN BREAD, PASTA, RICE, ETC.)	0	1	2	3	4	5
POTATOES	0	1	2	3	4	5
FRUITS	0	1	2	3	4	5
VEGETABLES	0	1	2	3	4	5
LEGUMES	0	1	2	3	4	5
FISH	0	1	2	3	4	5
RED MEAT AND PRODUCTS	5	4	3	2	1	0
POULTRY	5	4	3	2	1	0
FULL FAT DAIRY PRODUCTS (CHEESE, YOGHURT, MILK)	5	4	3	2	1	0
USE OF OLIVE OIL IN COOKING (TIMES/WEEK)	NEVER	RARE	<1	1-3	3-5	DAILY
ALCOHOLIC BEVERAGES (ML/DAY, 100ML=12G ETHANOL)	<300	300	400	500	600	>700 OR 0

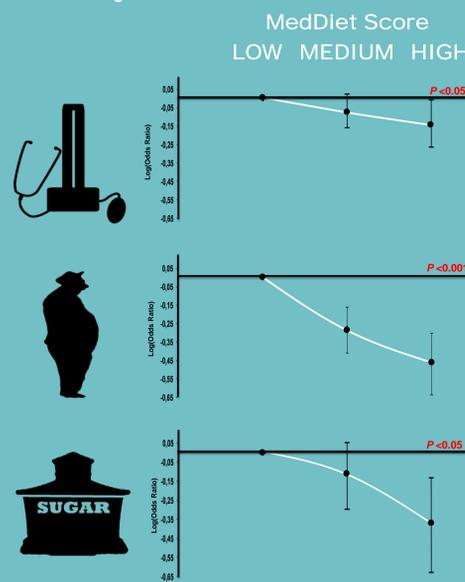
## RESULTS



### MULTIVARIATE LOGISTIC REGRESSION ANALYSES OF FACTORS ASSOCIATED WITH HYPERTENSION, OBESITY AND DIABETES

	HYPERTENSION OR (95% CI)	OBESITY OR (95% CI)	DIABETES OR (95% CI)
<b>GENDER</b>			
FEMALE	1	1	-
MALE	0.80 (0.68-0.95)*	1.33 (1.07-1.66)*	-
<b>AGE, 1-YEAR</b>	1.01 (1.00-1.01)**	1.02 (1.02-1.02)**	1.06 (1.05-1.07)**
<b>EDUCATIONAL LEVEL</b>			
LOW	1	1	-
MEDIUM	0.96 (0.81-1.14)	0.85 (0.68-1.06)	-
HIGH	0.73 (0.51-1.05)	0.45 (0.25-0.81)	-
<b>SMOKING STATUS</b>			
NON-SMOKER	1	1	-
FORMER SMOKER	1.24(1.01-1.53)*	1.29(0.99-1.68)	-
SMOKER	1.36(1.10-1.66)**	0.99(0.74-1.31)	-
<b>PHYSICAL ACTIVITY LEVEL</b>			
SEDENTARY	1	1	1
LIGHT	0.88 (0.74-1.05)	0.73 (0.58-0.91)**	0.78 (0.56-1.09)
ACTIVE	0.70 (0.54-0.91)**	0.37 (0.24-0.56)**	0.43 (0.21-0.87)*
<b>ALCOHOL QUANTITY (G/DAY)</b>			
<12	1	1	1
12-35	1.91 (0.84-4.36)	0.88 (0.64-1.20)	0.30 (0.05-1.75)
36-48	1.43 (0.64-3.16)	0.77 (0.52-1.13)	0.25 (0.04-1.37)
>48	1.94 (0.95-3.95)	1.45 (0.98-2.13)	0.30 (0.05-1.62)
<b>TYPE OF ALCOHOL</b>			
NONE	1	-	1
RED WINE	0.42 (0.18-0.98)*	-	2.15 (0.36-12.98)
WHITE WINE	0.63 (0.29-1.37)	-	4.02 (0.74-21.70)
BEER	0.71 (0.32-1.57)	-	4.82 (0.84-27.54)
SPIRITS	0.76 (0.34-1.70)	-	3.88 (0.69-21.90)
<b>CAFFEINE (MG/DAY)</b>			
<80	-	-	1
80-120	-	-	0.71 (0.48-1.05)
>120	-	-	0.57 (0.35-0.94)*

Because confounding may still exist, multiple regression analysis were performed to evaluate relations between prevalence of hypertension, obesity, diabetes, and the Mediterranean diet score. All models confirmed the previously observed inverse relations across the aforementioned variables and diet score. Specifically, participants in the highest tertile of adherence with the MedDietScore were less likely to be obese, hypertensive, and diabetic. Moreover, obese participants were more likely to be older male, less educated, and more frequently sedentary than participants who were normal/overweight. Hypertensive patients had similar characteristics than those observed in obese, but relevant associations were found with current smoking status and female gender, probably due to the old mean age of the cohort and the higher incidence of hypertension in postmenopausal women. Finally, in addition to the inverse association between adherence with the Mediterranean diet and diabetes, also physical activity showed an indirect association with the likelihood of having diabetes.



## CONCLUSIONS

We provided new and important information about health status and food consumption in Sicily. In this work we explored the association between Mediterranean diet and some cardiovascular risk factors, including obesity, hypertension, and diabetes. We reached the conclusion that despite greater adherence to this dietary pattern was associated with a better health status, the prevalence rates of nutrition-related diseases are dramatically high in Sicily. Further studies are needed to better identify the key factors connecting the high adherence with the Mediterranean diet and cardiovascular risk factors. Nevertheless, public health efforts should be taken to decrease the burden of such diseases.

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