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Weather patterns associated with respiratory and cardiovascular hospital admissions in Heraklion, Crete Island, Greece

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The aim of this study is to evaluate the relationship between the daily weather types and hospital admissions for respiratory and cardiovascular problems in Heraklion, Crete during the period 2008-2012. Crete located in the southest border of East Mediterranean basin confront exacerbating atmospheric conditions due to the tracks of passing air masses, as well as Saharan dust outbreaks and Föhn winds, which are associated with either short or long term effects on human health.

The medical data concern daily admissions of outpatients with respiratory and cardiovascular diseases, recorded by the emergency departments of the two main hospitals in Heraklion city. The meteorological data analyzed consist of daily values of 24 parameters, which were acquired from the Hellenic National Meteorological Service during the study period: maximum temperature (Tmax); minimum temperature (Tmin); mean temperature (Tmean); diurnal temperature range (Trange = Tmax – Tmin); day-today change in maximum temperature (ΔTmax); day-to-day change in minimum temperature (ΔTmin); day-to-day change in mean temperature (ΔTmean); day-to-day change in diurnal temperature range (ΔTrange); mean relative humidity (RH); day-to-day change in mean relative humidity (ΔRH); mean water vapor pressure (e); day-to-day change in mean water vapor pressure (Δe); mean atmospheric pressure at sea level (P); day-to-day change in mean atmospheric pressure (ΔP); mean irradiance (I); day-to-day change in mean irradiance (ΔI); mean sunshine (S); day-to-day change in mean sunshine (ΔS); mean wind speed (v) and day-to-day change in mean wind speed (Δv).

The performed analysis was based on statistical methods, such as Factor and Cluster analysis and Pearson's $\chi 2$ test using contingency tables. The application of this multivariate analysis revealed the relationship between the extracted weather types and the frequency of respiratory and cardiovascular diseases in Heraklion, Crete Island.

KEY WORDS: Weather types, respiratory and cardiovascular diseases, Heraklion, Crete Island.