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Titolo

ANALYSIS OF CLIMATIC IMPACT ON EMERGENCY DEPARTMENT DIAGNOSIS

Identificativo

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INTRODUCTION

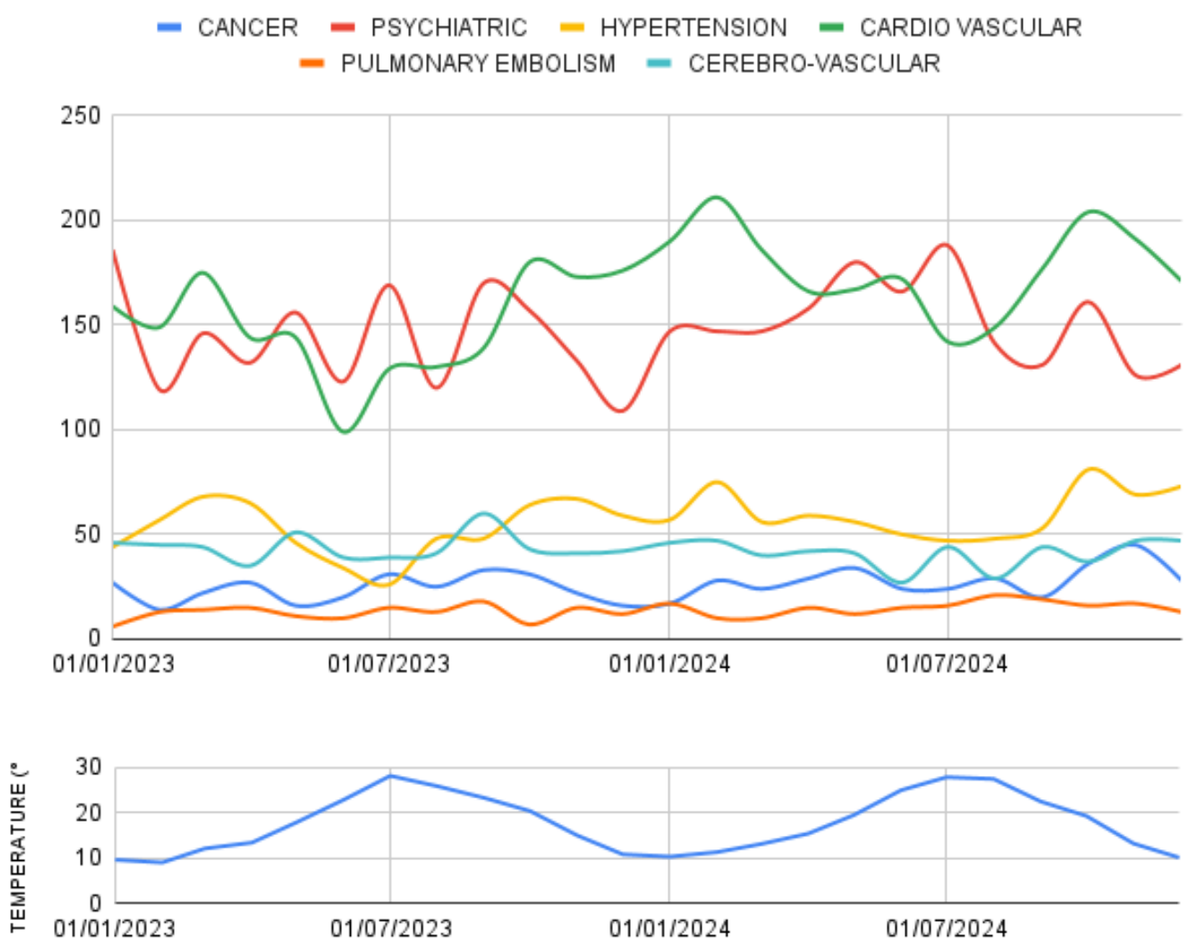
Analyzing climatic data and correlating it with emergency department (ED) access data can provide an opportunity to identify seasonal trends and can help optimize healthcare resource allocation and improve management of seasonal surges in ED demand.

MATERIALS AND METHODS

The analysis was conducted by examining the ED access data from the Policlinico of Bari (2023–2024), extracted monthly through the Edotto system. Causes of ED access were categorized into trauma, fever, arrhythmias, hypertension (HTN), chest pain (CP), abdominal pain (AP), dyspnea, psychiatric, burns, and dehydration. Discharge diagnoses were grouped into major disease categories, including tumors, psychiatric, HTN, cardiovascular diseases (CVD), pulmonary embolism (PE), and cerebrovascular diseases (CeVD). Climatic data for the corresponding periods were collected from the *ilMeteo* archives, including monthly averages of temperature (mean, minimum, maximum), humidity, and the number of days with rain, snow/hail, thunderstorms, and fog.

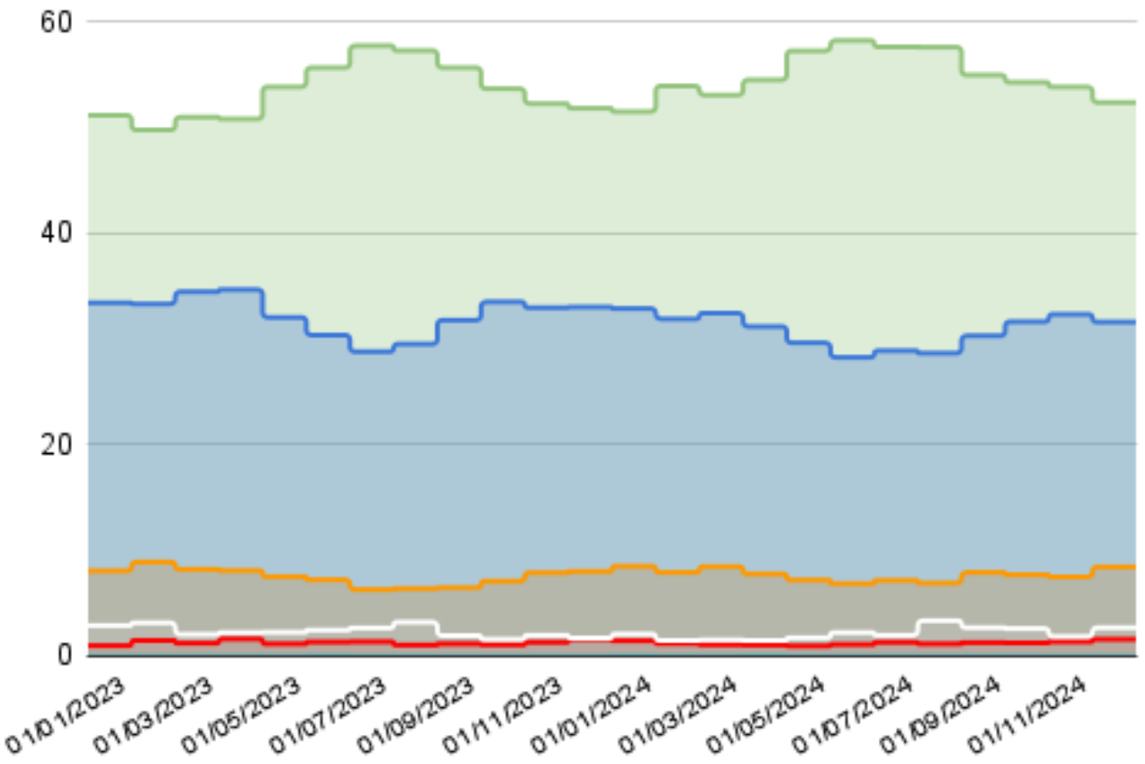
RESULTS

Over the study period, the ED recorded a mean of 5,576 ± 545.3 accesses per month. Analyzing specific causes of access, trauma-related visits increased with higher temperatures and the occurrence of thunderstorms, while decreasing with higher humidity and wind. Similarly, fever-related accesses were positively associated with rising temperatures and negatively influenced by humidity, rainy days, and fog. No significant associations were found between arrhythmia-related accesses and climatic variables. In contrast, accesses for HTN and CP demonstrated an inverse relationship with temperature, while positively correlating with humidity. AP-related accesses were positively correlated with higher temperatures, whereas dyspnea-related visits showed an opposite trend, increasing with higher humidity and more rainy days but decreasing with rising temperatures. No significant climatic correlations emerged for psychiatric or dehydration-related accesses. Burn-related visits, however, rose with increasing temperatures and declined with higher humidity and rainfall. Regarding coded discharge diagnoses, no significant associations were observed for tumors and psychiatric disorders. In contrast, HTN and CVD diagnoses were negatively correlated with temperature and positively associated with humidity levels. A borderline positive correlation was identified between pulmonary embolism diagnosis and humidity (p=0.05). Finally, CeVD diagnoses mirrored the CV pattern, decreasing with higher temperatures and increasing with greater humidity.



DISCUSSION

Our findings confirm that climatic variables significantly influence the pattern of emergency department accesses. In particular, higher temperatures were associated with an overall increase in ED visits, especially for trauma, fever, AP, and burns, while colder periods were more strongly linked to CV and respiratory complaints such as hypertension, CP, and dyspnea.
The negative correlation between humidity and access rates for certain conditions (e.g., trauma, fever, burns) suggests that not only temperature but also atmospheric moisture significantly modulates acute disease occurrence.



CONCLUSION

Climate fluctuations have a measurable impact on emergency department activity, affecting both the volume and nature of accesses. Understanding these patterns can help optimize resource allocation, anticipate seasonal surges in specific pathologies, and guide public health interventions aimed at mitigating the effects of climate variability on acute health events.

Affiliazioni

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RESEARCH ABSTRACT: Enviromental Health Reasearch