



# Thyroiditis Incidence and COVID-19 Epidemic in Sanandaj, Iran: A Time-Series Analysis

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## ABSTRACT

**Introduction:** This study aimed to investigate the potential correlation between reported cases of thyroiditis and the COVID-19 pandemic in Sanandaj, Iran, using time-series analysis techniques. The data was collected from the two nuclear medicine centers in Kurdistan province, which are the only centers and the main referral facilities for nuclear medicine.

**Methods and Materials:** Based on thyroid scan findings from these two centers in 2019 and 2020, individuals diagnosed with thyroiditis were included. Time-series analysis, cross-correlation analysis, and analysis of lagged effects examined the temporal patterns and potential correlations between thyroiditis cases and COVID-19 data.

**Results:** The time-series analysis employed an autoregressive integrated moving average (ARIMA) model with a lag length of 3. While the cross-correlation analysis showed positive and significant correlations at lags 1 to 5, with the highest cross-correlation coefficient of 0.4674 ( $p = 0.05$ ) at lag 3, suggesting a potential 3-month optimal lag, this lag was not meaningful. The analysis of lagged effects did not reveal a statistically significant relationship between the two variables ( $F(6, 27) = 1.18, p = 0.3444$ ), indicating that the trends of thyroiditis and COVID-19 cases are not related and COVID-19 cannot predict subsequent thyroiditis cases.

**Conclusion and Discussion:** Despite clinical and observational reasoning suggesting a potential association between COVID-19 and thyroiditis, this study did not find strong evidence for a significant correlation between these two incidents in the population studied.

**Keywords:** COVID-19, Nuclear medicine, Thyroiditis