**Seasonal Statistical Analysis of ICU Cost Search Trends in India (2023-2025)**

**Data Organization by Seasons**

**Summary Statistics by Season**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Season** | **Mean** | **Median** | **SD** | **Min** | **Max** |
| Summer | 22.56 | 0.0 | 29.37 | 0 | 70 |
| Monsoon | 29.86 | 42.0 | 27.45 | 0 | 74 |
| Post-monsoon | 34.06 | 45.0 | 30.87 | 0 | 82 |
| Winter | 26.70 | 0.0 | 33.11 | 0 | 100 |

**Statistical Tests**

1. **Kruskal-Wallis Test**
   * H-statistic = 1.37
   * p-value = 0.713
   * **Result:** No statistically significant differences between seasons (p > 0.05)
2. **Seasonal Mann-Kendall Test Results**

|  |  |  |  |
| --- | --- | --- | --- |
| Season | Tau | p-value | Sen's Slope |
| Summer | 0.16 | 0.410 | 0.00 |
| Monsoon | 0.12 | 0.343 | 1.94 |
| Post-monsoon | 0.06 | 0.764 | 4.82 |
| Winter | -0.14 | 0.375 | 0.26 |

* **No statistically significant trends detected (p > 0.05).**

1. **Year-over-Year Seasonal Comparison**

|  |  |  |  |
| --- | --- | --- | --- |
| Season | 2023 Mean | 2024 Mean | % Change |
| Summer | 22.00 | 22.77 | +3.50% |
| Monsoon | 29.94 | 29.78 | -0.55% |
| Post-monsoon | 40.11 | 27.25 | -32.06% |
| Winter | 28.00 | 31.85 | +13.74% |

**Key Findings**

* **Seasonal Patterns:**
  + **Highest mean search volume:** Post-Monsoon (34.06)
  + **Lowest mean search volume:** Summer (22.56)
  + **Greatest variability:** Winter (SD = 33.11)
  + **Most stable:** Monsoon (SD = 27.45)
* **Trend Analysis:**
  + **No statistically significant trends detected across seasons.**
  + **Post-Monsoon and Monsoon show slight positive trends, but not significant.**
  + **Winter exhibits a slight negative trend.**
* **Year-over-Year Growth:**
  + **Largest increase:** Winter (+13.74%)
  + **Slight rise in Summer (+3.50%)**
  + **Largest decline:** Post-Monsoon (-32.06%)

**Statistical Insights**

* **ICU cost search interest has fluctuated, with no clear seasonal pattern emerging.**
* **The sharp drop in Post-Monsoon search volume suggests a possible shift in user interest.**
* **Overall, seasonal differences in search patterns are not statistically significant.**

**Limitations**

* **Time Series Constraints:**
  + Limited to a two-year period.
  + External influences such as healthcare policy changes may affect trends.
* **Search Volume Considerations:**
  + Data is from Google Trends and represents relative search interest.
  + Regional variations within India may affect results.

**Conclusions**

The analysis indicates **no statistically significant seasonal differences** in ICU cost search trends. However, Winter shows a moderate increase in interest, while Post-Monsoon has seen a notable decline. Further investigation is needed to understand the driving factors behind these variations.