Article "Is there a Season for Homicide?"

There were 1361 random murders from 4 seasons:

<table>
<thead>
<tr>
<th>Season</th>
<th>0 = Observed Murders</th>
<th>3 categories</th>
<th>( k = 4 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Winter</td>
<td>328</td>
<td>random</td>
<td></td>
</tr>
<tr>
<td>Spring</td>
<td>334</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Summer</td>
<td>372</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fall</td>
<td>327</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Claim: equal rates for all 4 seasons \( (\alpha = .05) \)

Hypothesis:

- \( H_0: p_1 = .25, p_2 = .25, p_3 = .25, p_4 = .25 \)
- \( H_1: \text{at least one is wrong} \)

Data: See above

Requirement: Each expected freq. \( (E=np_i) \) is at least 5.

\[
X^2 = \sum \frac{(0-E)^2}{E}
\]

\[
= 4.0345
\]

Critical Value:

Right tail

Test Always 0

(No pval) Not required

\( \chi^2 \) Test

\( 7.8147 \) C.V.

\( \chi^2 \) table

\( d.f = k-1 = 3 \)

\( \alpha = .05 \)

Conclusion: If T.S. > C.V. Then reject \( H_0 \) support \( H_1 \)

Fail to reject \( H_0 \): We cannot reject the claim that the murder rates are the same for each season of the year.