

Kruskal-Wallis Rank-Sum Test

Standalone verified Python analysis

Test: Kruskal-Wallis Rank-Sum Test

Design: Independent final-grade comparison across three guardian categories.

Variables: G3, guardian

Null hypothesis: All guardian groups have the same final-grade distribution.

Formula: $H = [12/(N(N+1))] \sum_i R_i^2/n_i - 3(N+1)$, divided by the tie correction.

Source rows: 649

Calculated metrics:

statistic: 8.017739591614378

p_value: 0.018153901261942596

degrees_of_freedom: 2

epsilon_squared: 0.009315386364728138

Independent reference values:

statistic: 8.017739591614378

p_value: 0.018153901261942596

df: 2

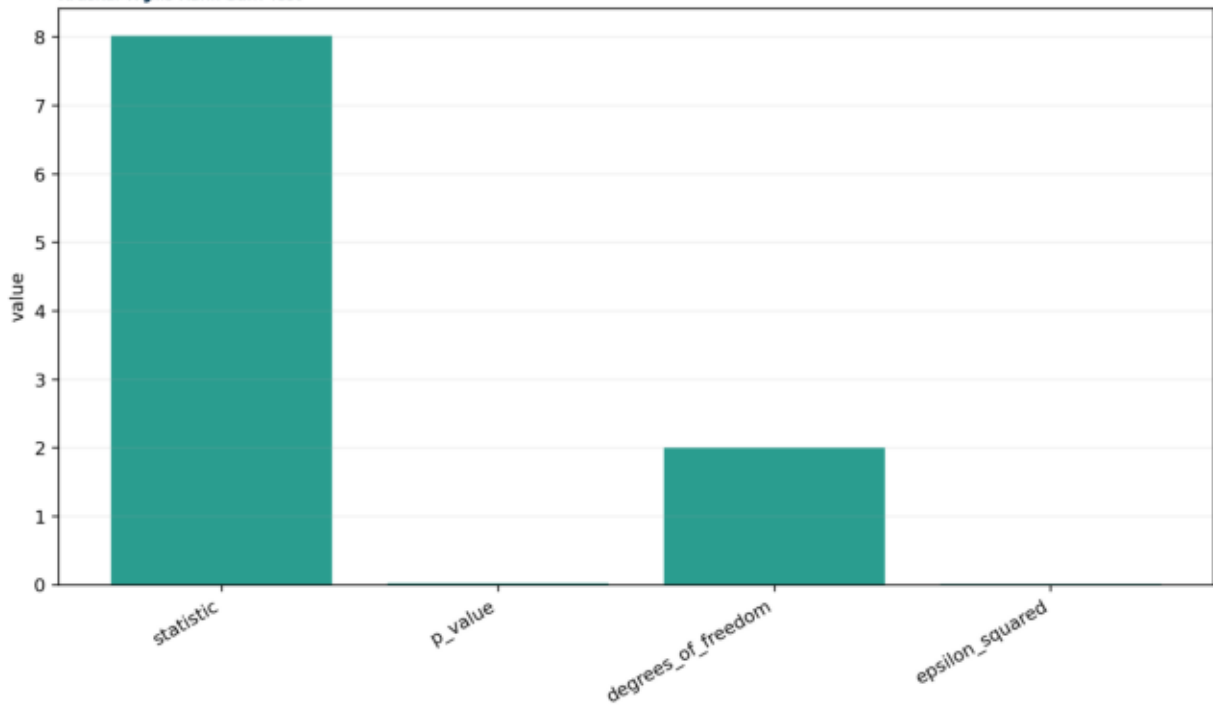
epsilon_squared: 0.009315386364728138

Interpretation:

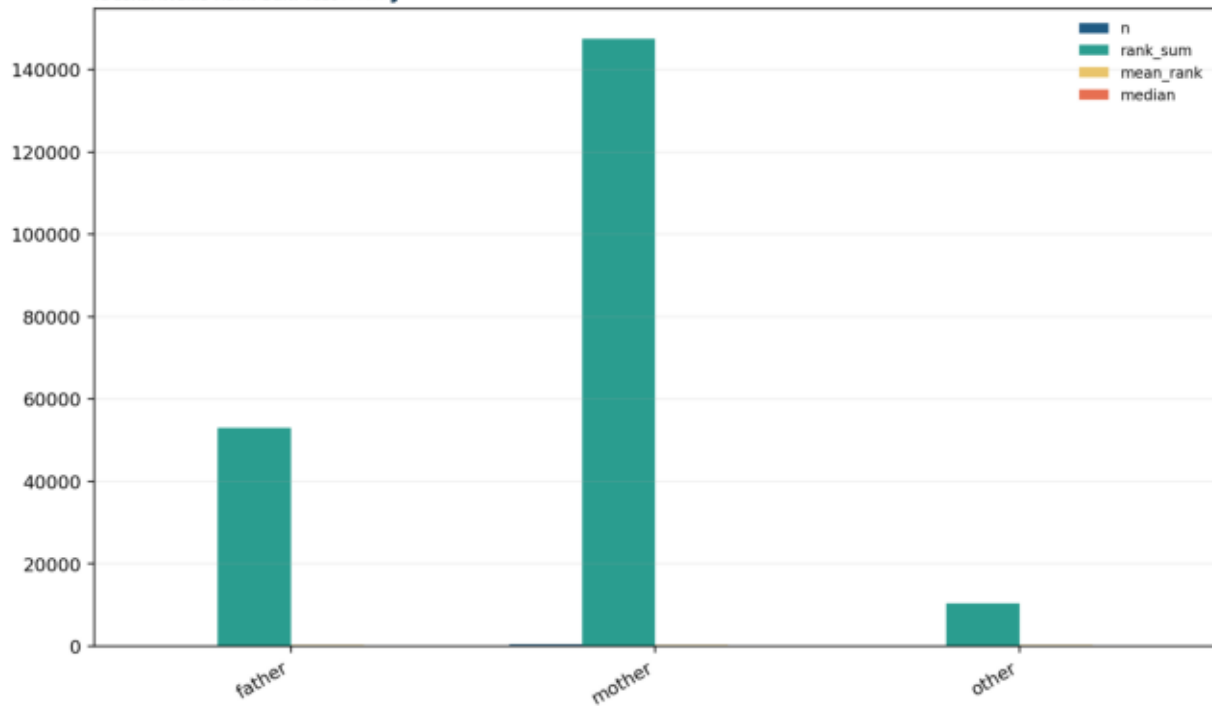
Kruskal-Wallis pools and midranks all three independent groups before comparing rank sums.

H=8.017740, p=0.0181539.

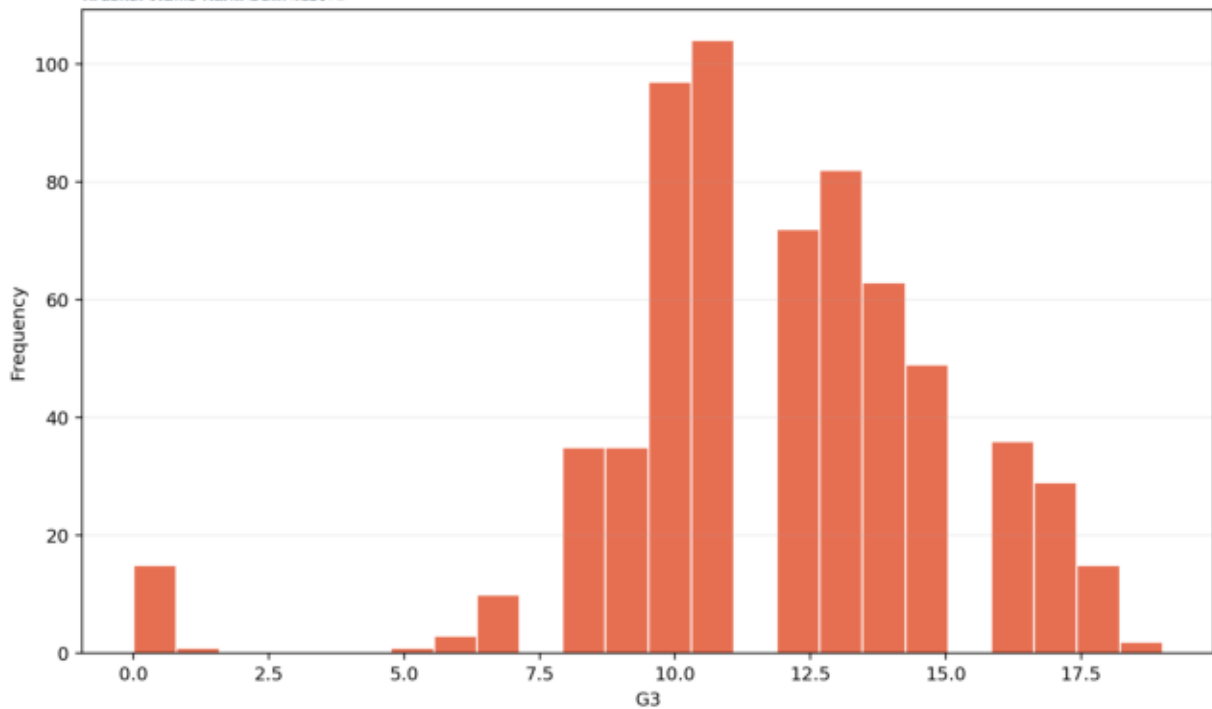
Primary Metrics



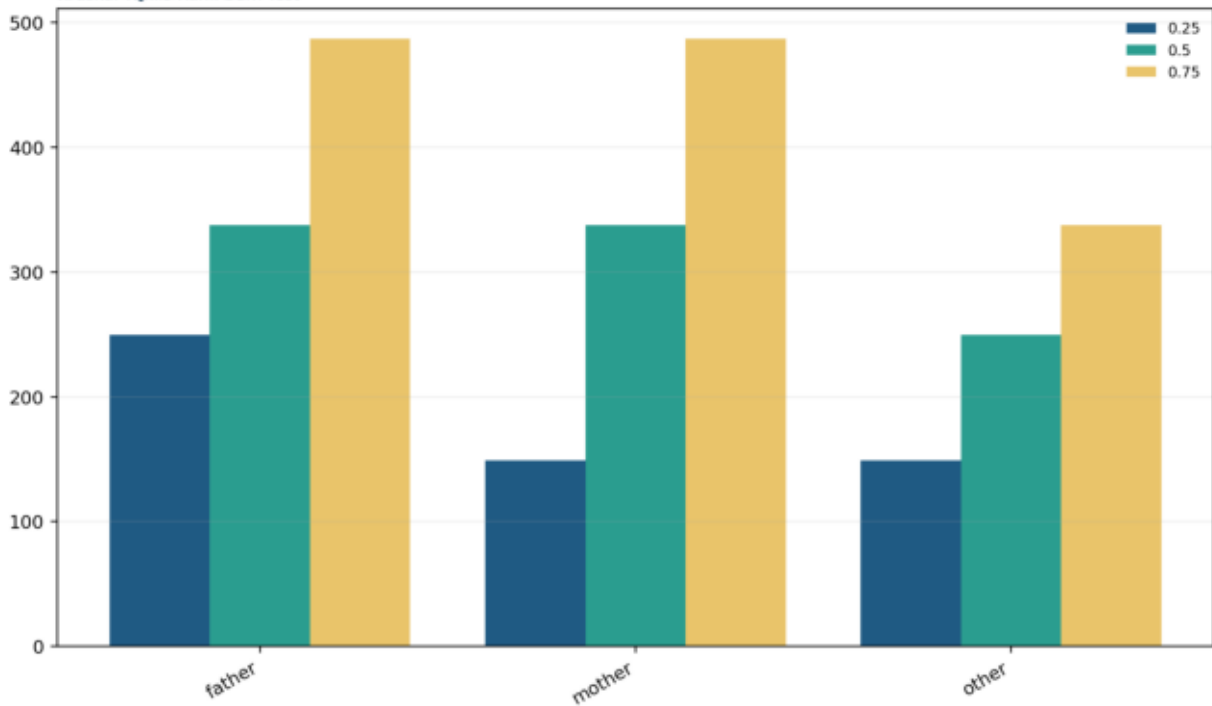
Guardian Rank Summary



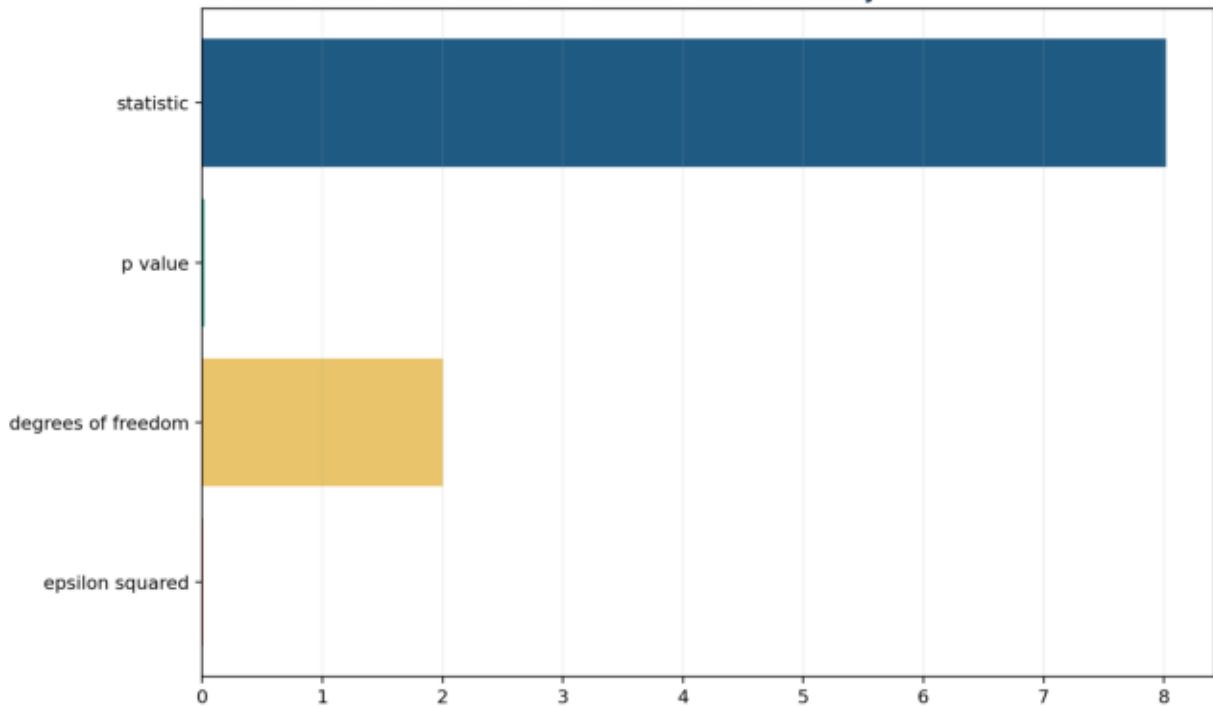
Ranked Observations



Rank Quantiles



Kruskal-Wallis Rank-Sum Test verified result summary



Primary Metrics

metric	value
statistic	8.01774
p_value	0.0181539
degrees_of_freedom	2
epsilon_squared	0.00931539

Guardian Rank Summary

guardian	n	rank_sum	mean_rank	median
father	153	53042	346.68	12
mother	455	147464	324.097	12
other	41	10419	254.122	11

Ranked Observations

guardian	G3	rank
father	11	249.5
father	13	414.5
father	13	414.5
father	12	337.5
father	12	337.5
father	12	337.5
father	11	249.5
father	15	543
father	10	149
father	11	249.5
father	12	337.5
father	9	83
father	14	487
father	16	585.5
father	10	149
father	12	337.5
father	15	543
father	11	249.5
father	12	337.5
father	12	337.5
father	12	337.5
father	11	249.5
father	12	337.5
father	16	585.5
father	10	149
father	14	487

Rank Quantiles

guardian	0.25	0.5	0.75
father	249.5	337.5	487
mother	149	337.5	487
other	149	249.5	337.5