

XXXIII CONGRESSO NAZIONALE AIRO

AIRO2023

BOLOGNA,
27-29 OTTOBRE 2023

PALAZZO DEI CONGRESSI

Radioterapia Oncologica: l'evoluzione al servizio dei pazienti



Associazione Italiana
Radioterapia e Oncologia clinica

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Evaluating quality scores concordance for radiomic studies on nasopharyngeal cancer among different professionals

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BACKGROUND & AIM

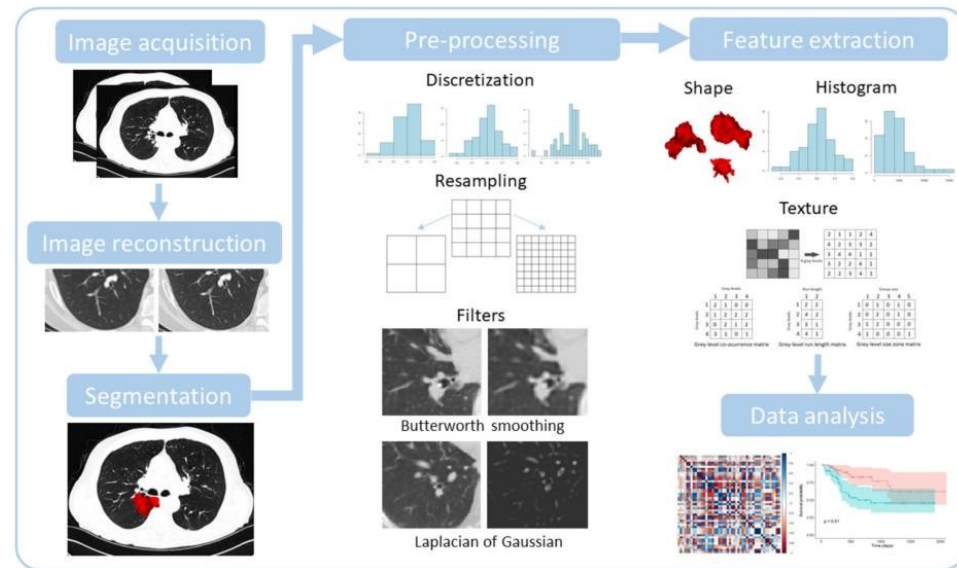
The increasing availability of radiomic studies has led to the creation of several scoring systems, to assess the quality of evidence through a systematic approach. However, the reproducibility of these scores has never been tested. Hence, this work aims to assess the inter-observer agreement among Radiation Oncologists (ROs) and non-clinical professionals in scoring available literature on radiomic applications in magnetic resonance imaging (MRI)-based studies for nasopharyngeal cancer (NPC). Two popular scores were considered, namely the Luo score and the Radiomic Quality Score (RQS).

METHODS

In January 2023, a PRISMA-compliant systematic review identified 31 eligible records, to be rated by four ROs, one statistician and one biotechnologist with dedicated experience in radiomics and/or NPC.

Inter-observer agreement among all the readers and between ROs and non-clinical researchers was assessed by the interclass correlation coefficient (ICC) with 95% confidence intervals (CIs).

The Bland-Altman approach was implemented to provide the average difference between clinical and non-clinical scores with 95% limits of agreement; these were then compared by using the Wilcoxon signed rank test. P-values < 0.05 were considered statistically significant. Analyses were performed with the SAS software v.9.4.



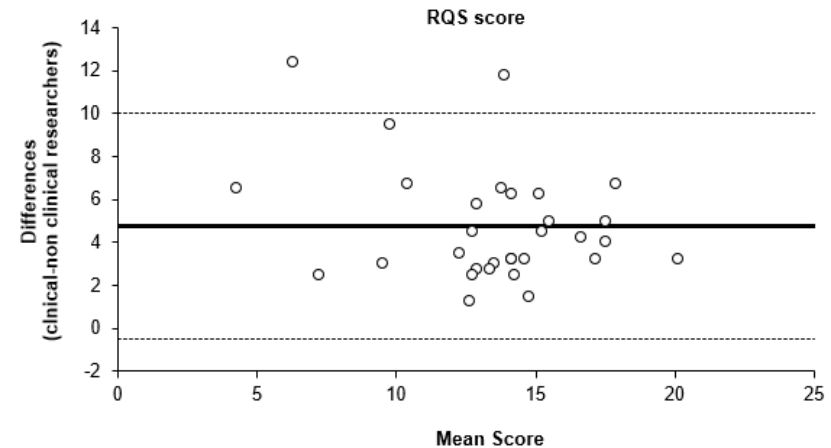
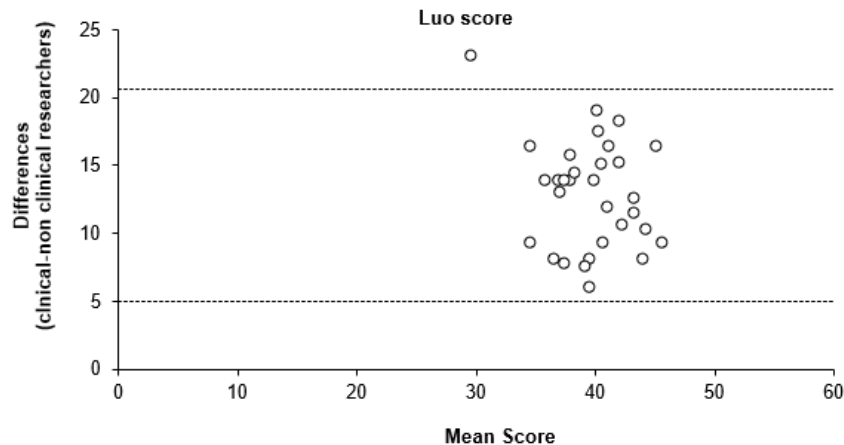
Fornacon-Wood et al, 2020

RESULTS

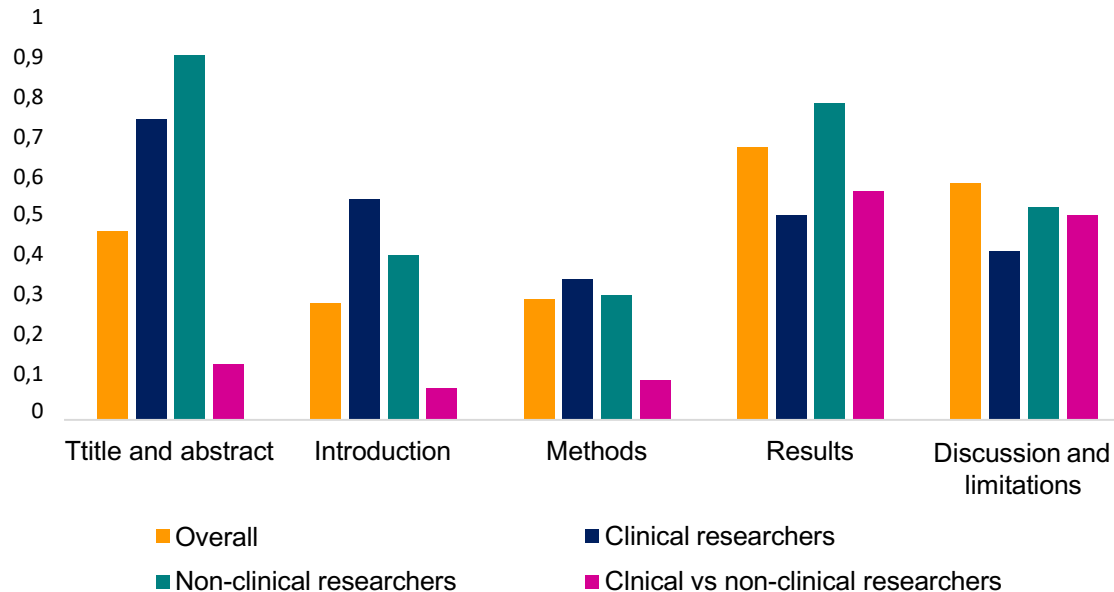
The agreement between readers was higher for the RQS (ICC; 95%CI: 0.79; 0.69-0.88) than the Luo score (0.46; 0.31-0.63) as well as the agreement within the four clinical readers: RQS ICC (95%CI): 0.77 (0.65-0.87); Luo score: 0.64 (0.45-0.79).

Agreement within the two non-clinical readers was similar to the one provided by ROs for RQS (ICC; 95%CI: 0.78; 0.66-0.88), while it was higher for the Luo score (0.72; 0.58-0.84).

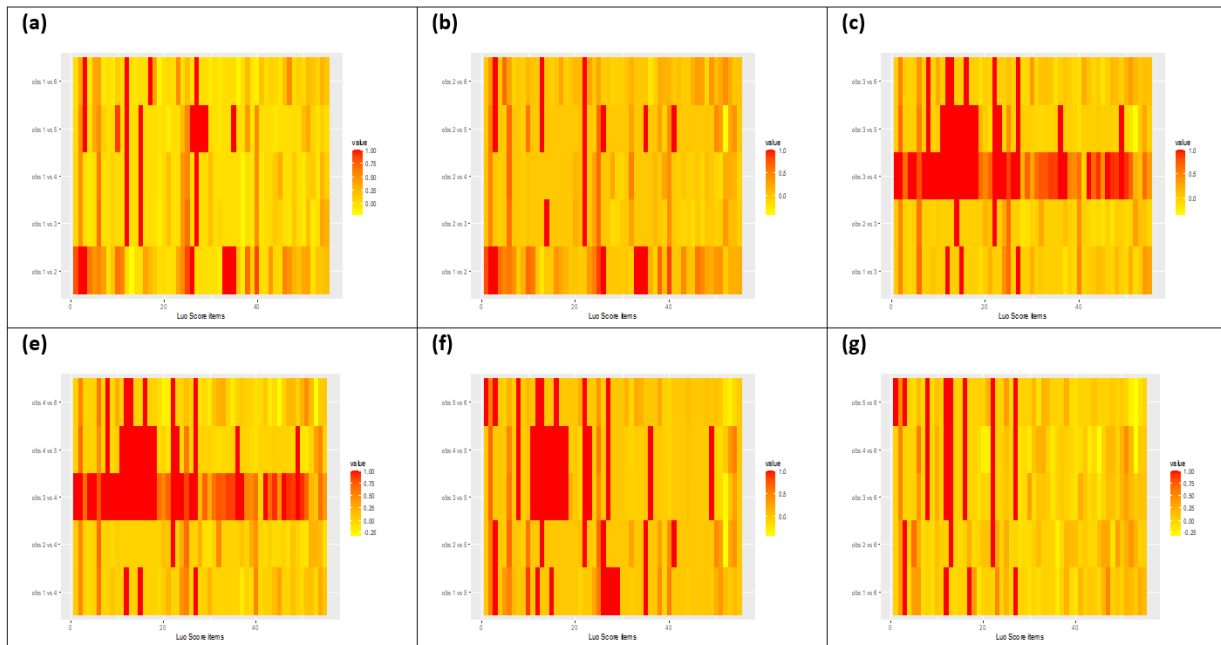
Overall, ROs assigned higher scores than non-clinicians ($p < 0.0001$ for both scores), with very low ICC for Luo score (ICC; 95%CI: 0.15; 0.06-0.30) and fair ICC for RQS (0.57; 0.40-0.74). Bland-Altman plots show that ROs assigned on average 13 points more than non-clinical readers, with 95%LA: 5 to 21 for the Luo score, and they assigned on average 5 points more than non-clinicians, with 95% LA: -1 to 10 for RQS



ICC- LUO SCORE, MANUSCRIPT SECTION



Agreement on single items of the Luo Score for each paired comparison of observers: (a) observer 1; (b) observer 2; (c) observer 3; (d) observer 4; (e) observer 5; (f) observer 6.



CONCLUSIONS:

- ❑ The RQS yielded the highest level of agreement among professionals, with a fair agreement among Radiation Oncologists.
- ❑ Scores assigned by ROs were significantly higher than those provided by non-clinicians.
- ❑ Albeit simpler, the RQS seems to be more user-friendly and reproducible than the Luo score in this setting

Thanks for your attention!