SWAR 45: Impact of Adherence to TRIPOD/+AI on Risk of Bias Using the PROBLAST tool

Objective of this SWAR
1. To measure the adherence of prognostic studies to the relevant TRIPOD or TRIPOD+AI reporting guideline (which superseded the TRIPOD 2015 guidance) and to evaluate if this has an impact on the risk of bias assessments of these studies using the PROBLAST tool.
2. To investigate whether prior reviewer knowledge of the extent of adherence to TRIPOD/+AI impacts their risk of bias judgement.

Study area: Critical Appraisal, Reporting
Sample type: Review Authors
Estimated funding level needed: Unfunded

Background
TRIPOD+AI (Transparent reporting of a multivariable prediction model for individual prognosis or diagnosis) is a reporting tool that is intended to ensure transparency and consistent reporting of the development and validation of prognostic models.[1] PROBLAST (Prediction model risk of bias assessment tool) is a framework to evaluate the risk of bias of these studies.[2] Both help with the appraisal of the trustworthiness and applicability of prognostic models. Better adherence to TRIPOD should allow for a more accurate and reliable PROBLAST assessment.

To our knowledge, no studies have looked at the extent that adherence to TRIPOD affects the PROBLAST assessment but systematic reviews of prognostic studies that use both tools allow an opportunity to measure any effect quantitatively. The TRIPOD guidance has an additional framework to measure the adherence of studies to the guidance, which provides a convenient way to standardise measurement across systematic reviews.[3]

This Study Within a Review (SWAR) [4] will investigate this. It will also investigate the effect of knowledge of the TRIPOD adherence on the risk of bias assessment. It is being implemented in a systematic review of the performance of artificial intelligence and traditional predication models for the prognosis of dental implants.[5]

Interventions and Comparators
Intervention 1: risk of bias assessment completed after measurement of adherence to TRIPOD/+AI.
Intervention 2: risk of bias assessment completed before measurement of adherence to TRIPOD/+AI.

Index Type: Full Review

Method for Allocating to Intervention or Comparator:
Randomisation

Outcome Measures
Primary: (1) Percentage score for adherence to TRIPOD/+AI using the guidance and data extraction template [3] that is recommended by the TRIPOD group for measuring adherence to both TRIPOD 2015 and TRIPOD+AI compared to the overall risk of bias judgement (using the PROBLAST tool); (2) Overall risk of bias judgement (using the PROBLAST tool) (assessed after or before measurement of adherence).

Secondary :

Analysis Plans
The analyses will seek to answer two questions: (1) Does the risk of bias judgement differ by adherence to TRIPOD/+AI (null hypothesis: there is no association between the risk of bias

category (high, low, unclear) and the adherence (percentage)? (2) Does the timing of the adherence measurement (before or after risk of bias assessment) influence the risk of bias category (null hypothesis: there is no association between reviewer knowledge of adherence measurement and the risk of bias category)?

A small number of studies is expected in any single review, including the host review for this SWAR. Using the R package 'pwr': for an estimated medium effect size (Cohen's f = 0.25; Cohen's w = 0.30), a significance of 0.05, and a power of 0.80; and using ANOVA to assess the first research question and the Chi-Squared test for independence for the second research question; would require 53 per group and 108 observations, respectively.

Possible Problems in Implementing This SWAR

ANOVA assumes that adherence is normality distributed. Therefore, a histogram will be plotted, as well as Q-Q plots, before an ANOVA analysis is carried out to check for normality. If the data is not normal a statistician will be involved to transform the data or to help implement non-parametric methods.

If, as expected, a sufficient number of studies is not available in a single review, it is hoped that other authors will implement this SWAR, allowing the results to be combined in a meta-analysis. However, it is important for the second research question that the authors arriving at the risk of bias judgement are the same as those whose percentage adherence is averaged.

References

1. Collins G, Moons K, Dhiman P, Riley R, Beam A, Van Calster B, et al. TRIPOD+AI statement: updated guidance for reporting clinical prediction models that use regression or machine learning methods. BMJ 2024;385:e078378.
2. Wolff R, Moons K, Riley R, Whiting P, Westwood M, Collins G, et al. PROBAST: A Tool to Assess the Risk of Bias and Applicability of Prediction Model Studies. Annals of Internal Medicine 2019;170(1):51-8.
3. Heus P, Damen J, Pajouheshnia R, Scholten R, Reitsma J, Collins G, et al. Uniformity in measuring adherence to reporting guidelines: the example of TRIPOD for assessing completeness of reporting of prediction model studies. BMJ Open 2019;9(4):e025611.
4. Devane D, Burke NN, Treweek S, Clarke M, Thomas J, Booth A, et al. Study within a review (SWAR). Journal of Evidence-Based Medicine 2022;15(4):328-32.
5. Jandu J, Maharajan V, Kaur M, Redding S. The Performance of Artificial Intelligence and Traditional Predication Models for the Prognosis of Dental Implants – A Systematic Review Protocol. Available from https://www.crd.york.ac.uk/PROSPERO/view/CRD42025649581 (accessed on 31 March 2025).

Publications or presentations of this SWAR design

Examples of the implementation of this SWAR

Jandu J, Maharajan V, Kaur M, Redding S. The Performance of Artificial Intelligence and Traditional Predication Models for the Prognosis of Dental Implants – A Systematic Review Protocol. Available from https://www.crd.york.ac.uk/PROSPERO/view/CRD42025649581 (accessed on 31 March 2025).

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