

Propensity scoring — A novel research methodology

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Madam, Propensity scoring, a powerful tool used to strengthen causal inferences drawn from observational studies i.e. to estimate causal treatment effects.¹ It decreases selection bias as compared to randomized trials by reducing multiple covariates to a single propensity score, which is the probability that the patient receives treatment A (instead of B), given all relevant conditions, comorbidities, and other characteristics at the time the treatment decision is made.²

Propensity scores are estimated using the Propensity-Score Model. The data is grouped based on the estimated propensity scores then balance is assessed, to ensure that the grouping produced similar pools of patients receiving treatment A versus B and finally analyzed to estimate the treatment effect and its clinical and statistical significance. Following the construction of the propensity model and calculation of propensity score, matching, stratification and multivariable adjustment comparisons are applied for each patient.³

Two conditions on the data must be met for analyses to provide valid results. The most important is "strong ignorability" observed covariates contain all the information about the patient's condition that is relevant to potential outcomes.² If the goal is to compare similar groups of patients receiving different treatments, we need to know all the factors that determine whether

patients are comparable at the time of treatment allocation. Second, that given the covariates, the patient needs to have a positive probability of receiving both treatments. The goal of the propensity-score model is to create balanced groups of patients receiving each treatment.

Randomized control trials are far more superior to propensity models in terms of design and ethics, though few variables are available for analysis, unknown variables are not strongly correlated with measured variables and selection bias not completely eliminated leading to limitations yet propensity scores are more widely applicable than randomized trials.³

The Use of Propensity Scoring has seldom been discussed in developing countries especially Pakistan. In our view, Propensity scoring is an effective way to compare treatments modalities, literature new and old can be reviewed in the light of this scoring, in a country which lacks proper research centers and lack of funds allocated to specialized controlled trials; propensity scoring will prove to be beneficial in making clinical decisions.

References

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