

We consider nonrandomized pretest-posttest designs with complex survey data for observational studies. We show that two-sample pseudo empirical likelihood methods provide efficient inferences on the treatment effect, with a missing-by-design feature used for forming the two samples and the baseline information incorporated through suitable constraints. The proposed maximum pseudo empirical likelihood estimators of the treatment effect are consistent and pseudo empirical likelihood ratio confidence intervals are constructed through bootstrap calibration methods. The proposed methods require estimation of propensity scores which depend on the underlying missing-by-design mechanism. A simulation study is conducted to examine finite sample performances of the proposed methods under different scenarios of nonignorable and ignorable missing patterns. An application to the International Tobacco Control Policy Evaluation Project Four Country Surveys is also presented to demonstrate the use of the proposed methods for examining the mode effect in survey data collection.