Abstract:

Developing valid and reliable instruments is crucial but costly and time-consuming in health care research and evaluation. The FDA and the NIH have set up guidelines for developing patient-centered outcome (PRO) instruments. However, the guidelines are not applicable to cases of small sample sizes. Instead of using an exact estimation procedure to examine psychometric properties, the Bayesian Instrument Development (BID) method integrates expert data and participant data into a single seamless analysis. Using a novel set of priors, simulated data were used to compare BID to classical instrument development procedures and test the stability of BID. Mean square errors were always smaller when using BID compared to the classical approach. To display BID to non-statisticians, a graphical user interface (GUI) based on R and WINBUGS is demonstrated with data on a small sample of heart failure patients. Costs are saved by eliminating the need for unnecessary continuation of data collection for larger samples as required by classical instrument development approach.