

A 46-Item Checklist for the Statistical Evaluation of Medical Research Papers

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There is widespread evidence of the extensive use of statistical methods in modern medical research. Just the same, application standards are known to be generally low and a growing body of literature points to persistent statistical errors in most medical journals. The “misuse” of statistics in medical research has therefore been widely discussed, and it has been pointed out that it is both unethical and can have serious clinical consequences. In order to further enhance statistical quality in medical research, we present a standardized, comprehensive 46-item checklist for the statistical evaluation of medical research manuscripts, developed on the basis of manifold literature related to the topic. The checklist may either be just for the broad and in-depth statistical evaluation of submitted/published journal contributions or as a useful guideline when planning, conducting and presenting medical research. Although our assessment tool clearly cannot cover aspects of all statistical methods incorporated in modern medical research, it is to our knowledge one of the most comprehensive lists presented yet. While predominately focusing on the issue of statistical significance testing, the 46-item checklist includes multifaceted statistical aspects of study design, statistical analysis, documentation of applied statistical methods, as well as presentation and interpretation of study findings. Consideration of issues included in our checklist, when planning, conducting and preparing medical research manuscripts, should help to further enhance statistical quality in medical journals. In addition, however, statisticians should be involved early in study design, as mistakes at this point can have major repercussions, negatively affecting all subsequent stages of medical research.