

## Quality of Reporting: “Guilty Until Proven Innocent”

To improve the reports of randomized controlled trials, a group of 30 experts developed the *Standardized Reporting of Trials* (SORT) statement during a meeting in Ottawa, Ontario (Canada), in the early 1990s. Around the same time, another group of experts convened in Asilomar, California (United States), and proposed the *Recommendations for Reporting of Clinical Trials in Biomedical Literature*. In 1996, these two groups met and established the first *Consolidated Standards of Reporting Trials* (CONSORT) statement, which was the first conjoint international attempt to improve the reporting of randomized clinical trials. Following the CONSORT, other guidelines and statements have been developed for different kinds of research designs, such as *Preferred Reporting Items for Systematic Reviews and Meta-Analyses* (PRISMA) and *Strengthening the Reporting of Observational Studies in Epidemiology* (STROBE).

These official statements make important steps toward an evidence-based approach, thus allowing improvements in how results are interpreted, providing the information necessary for meta-analyses, and in general improving standards in the design of trials. These statements are also used for understanding the risk of bias in studies and hence for rating the quality of studies. This approach (referred to as *guilty until proven innocent*) is sometimes questioned because a lack of the reporting of some details does not necessarily mean that correct procedures were not followed. However, it has been shown that faulty or poor reporting often reflects faulty or poor methods. Although the *International Journal of Sports Physiology and Performance* has not endorsed these statements, researchers are encouraged to follow these guidelines.

Researchers who have tried to run a meta-analysis in sport science will have experienced how the general poor quality of reporting makes it very difficult to retrieve the information necessary for meta-analyses. A communication presented at the 2009 European College of Sport Science conference by Impellizzeri and colleagues<sup>1</sup> addressed the quality of reporting randomized training studies in soccer (which is one of the most studied sports). Among the 29 randomized studies reviewed, only 42% of the information considered important by the CONSORT group was reported, and all studies were classified at high risk of bias according to the Cochrane Risk of Bias Tool. In addition, another 21 intervention studies were characterized by weak designs: not randomized and simple pretests-posttests.

The list of important details that need to be reported and their explanations can be found in the statements, which are freely available online and easily accessible to any researcher. For the CONSORT, which is based on the two-group parallel design, there are now extensions for other kinds of randomized trials such as the cluster, non-inferiority and equivalence studies and pragmatic trials. The CONSORT consists of 25 items “selected because empirical evidence indicates that not reporting the information is associated with biased estimates of treatment effect or because the information is essential to judge the reliability or relevance of the findings” ([www.consort-statement.org](http://www.consort-statement.org)).

Among these items, it is worthwhile to mention the necessity that authors identify the study design in the title and/or abstract. This approach makes it easier to find articles for meta-analysis. The primary (main) and secondary outcomes should be specified. For example, what outcomes (among those usually measured) and what change would make the training effective and worthwhile to be used? The randomization method is another important detail that should be mentioned to understand whether the randomization was done correctly. When no procedure is specified, simple randomization should be assumed. Often, however, the randomization method is not reported but the groups are balanced. This situation is quite unlikely using simple randomization with small sample sizes. So, it is probable that some sort of restricted randomization was used in most of the studies. To note, minimization, if appropriately done, is considered acceptable. Similarly, when matching is used, the criteria should be specified. The flow chart of participants is another important piece of information for understanding the effectiveness (other than the efficacy) of the intervention and the reasons for dropouts. Finally, it is useful to mention item 20 of the CONSORT, on “trial limitations, addressing sources of potential bias, imprecision, and, if relevant, multiplicity of analyses.” Every study has limitations, and, when interpreting the results, both the researchers and the readers should take them into consideration. Limitations are often not reported, and sometimes even hidden. One of the reasons is probably a “fear” of the reviewers’ opinions, and specifically the concern that the reviewers might consider that the disclosed limitations are too severe and thus enter a recommendation to reject the article. The consequence is that we all too frequently read studies with strong claims but with weak designs and/or several limitations.

In conclusion, authors are strongly encouraged to improve the quality of reporting using the available statements and guidelines on experimental designs. Similarly, reviewers and editorial board members should reference these statements and be more vigilant of the quality of reporting, including the disclosure of the potential limitations.

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## Reference

1. Sport Sciences: Nature, Nurture and Culture. Book of Abstracts. 14th Annual Congress of the European College of Sport Science in Oslo, Norway, 24–27 June 2009. Edited by Loland S, Bø K, Fasting K, Hallèn, J, Ommundsen Y, Roberts G, Tsolakidis E. *European Database of Sport Science*. <http://www.ecss.mobi/>.