Sample sizes in COVID-19–related research

Cheung and colleagues warned that underpowered studies that committed a type II error will discourage clinicians from using effective treatment.[1] I agreed with this argument. Because the number of published clinical trials on coronavirus disease 2019 (COVID-19) patients has been increasing rapidly, I have reviewed all these trials published between Jan. 1, 2020, and Mar. 25, 2020, and indexed in PubMed, and assessed the quality of their sample size calculation.

I identified a total of 374 articles, 4 of which described trials. In general, the quality of sample size calculation was not acceptable. One study did not justify the sample size.[2] One assumed that the treatment can reduce the outcome variable by 40%, but the Cohen's *d* effect size should have been provided instead.[3] One study did not explicitly state the nonzero assumption of the control group effect[4] (they assumed the effect of the control group would be about 5%, according to the Fleiss formula with continuity correction used by the authors[5]). The fourth study did provide the effect size estimation, but the sample size calculated in the paper deviated from that calculated using the standard formula by 6% (the percentage of patients reaching the outcome within the study period should be 71.1%, as calculated according to the assumptions given by the authors, but in the article, they overestimated that to be 75%).[6] The power of their sample size would be 78% instead of the desired 80%.

Given the unacceptable quality of the sample size calculation of COVID-19 trials, I strongly suggest that all research teams include a statistician or invite a statistician to evaluate the appropriateness of the sample size calculation.

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