Usage and reporting practices of pre-study power analyses

* Indicates required question

1. Select coder *

Mark only one oval.

- ◯ Cristian
- ◯ Daniel
- ◯ Jennifer
- ◯ Joe

2. Select the journal *

Tick all that apply.

- ☐ European Journal of Sport Science
- ☐ International Journal of Sports Nutrition and Exercise Metabolism
- ☐ International Journal of Sports Physiology and Performance
- ☐ Journal of Applied Physiology
- ☐ Journal of Strength and Conditioning Research
- ☐ Journal of Science & Medicine in Sport
- ☐ Journal of Sports Science
- ☐ Medicine & Science in Sports & Exercise
- ☐ Scandinavian Journal
- ☐ Psychology of Sport & Exercise

3. Copy and paste study title *

4. Does the study report any type power analysis? *

This refers to the estimation of the sample size required to achieve a certain level of statistical pow given an effect size, statistical test and alpha level.

Mark only one oval.

- ◯ a priori *Skip to question 6*
- ◯ sensitivity *Skip to question 5*
- ◯ post-hoc *Skip to question 5*
- ◯ compromised *Skip to question 5*
- ◯ conditional *Skip to question 5*
- ◯ not reported *Skip to question 25*
- ◯ unclear *Skip to question 6*

Power analysis statement

5. Copy pasted quote of any power statement

_____

_____

_____

_____

_____

Skip to question 25

Pre-study power analysis

6. Copy pasted quote of the pre-study power statement *

7. Does the pre-study power statement include a dependent variable? *

This refers to the dependent variable for which the effect size of interest is related to.
By “specific” we refer to a construct that has been clearly operationalized into a specific and clear variable. By “umbrella term”, we refer to a dependent variable that can be operationalized in several alternative ways.
First check the power statement and then RESULTS/ABSTRACT to confirm whether the variable is specific or an "umbrella term".

Mark only one oval.

- ◯ yes, a clear and specific variable *Skip to question 8*
- ◯ yes, an umbrella variable *Skip to question 8*
- ◯ no *Skip to question 10*
- ◯ unclear

Pre-study power analysis

8. Report the dependent variable stated in the pre-study power analysis *

9. Does the dependent variable in the pre-study power analysis match any of the DV stated in the hypothesis statement?

1- **Using alternative measures of the same variable:** this refers to when a dependent variable is sco or measured in various alternative ways. For instance, second lactate threshold (LT2) us operationalized in three alternative ways such as power output at LT2, heart rate at LT2 and blooc lactate at LT2.

2- **Using different constructs of the same phenomena**: this refers to when the dependent variable in measured in several alternative ways. For instance, "endurance performance" is measured as pea power output, incremental time to fatigue, lactate threshold test. Another example could be that a study uses as a dependent variable "Functional Movement Screen (FMS)". In such case, the authors from this study did not specify which FMS test was used and only reported FMS as a dependent variable.

In the first case, the coder will report that the dependent variable stated in both the hypothesis and t pre-study power analysis match (answer = yes). In the second case, the coder will report that they d not match.

Mark only one oval.

- ◯ yes
- ◯ no
- ◯ unclear

Pre-study power analysis

10. Report calculated sample size from power analysis (otherwise, leave empty) *

This refers to the total sample size needed to achieve the intended power given the effect size of interest

11. Does the pre-study power analysis statement include an effect size? *

Standardised effect size refers to a difference achieved by dividing the mean difference by a standard deviation (e.g., Cohen's d family, Hedge's g family, eta squared)
Unstandardised effect size refers to a raw difference in means

Mark only one oval.

- ◯ yes, standardised *Skip to question 12*
- ◯ yes, unstandardised *Skip to question 15*
- ◯ not reported *Skip to question 18*
- ◯ unclear *Skip to question 15*

standardised effect sizes

12. Does the pre-study power statement report the type of the standardised effect size of interest?

Mark only one oval.

- ◯ Cohen's d family *Skip to question 13*
- ◯ Cohen's f *Skip to question 15*
- ◯ Hedge's g family *Skip to question 14*
- ◯ Glass's Δ *Skip to question 15*
- ◯ eta squared (η^2) *Skip to question 15*
- ◯ eta partial squared (ηp^2) *Skip to question 15*
- ◯ omega squared (ω2) *Skip to question 15*
- ◯ partial omega squared (ωp^2) *Skip to question 15*
- ◯ other *Skip to section 7 (Specify the type of "other" standardised effect size)*
- ◯ not reported *Skip to question 15*

Specify the type of "other" standardised effect size

Skip to question 15

Cohen's d family

13. Select the type of effect size from Cohen's d family

Mark only one oval.

- dz
- ds
- dpop
- unclear

Skip to question 15

Hedge's g family

14. Select the type of effect size from Hedge's g family

Mark only one oval.

- Hedge's g
- Hedge's gav
- Hedge's grm
- unclear

Pre-study power analysis

15. Report the magnitude of the effect size of interest (otherwise, leave empty)

16. Does the pre-study power analysis statement include the effect size justification or uses Cohen's d thresholds?

This refers to how researchers selected the effect size of interest.

Mark only one oval.

- ◯ previous study
- ◯ pilot study
- ◯ meta-analysis
- ◯ smallest effect size of interest (i.e., SESOI)
- ◯ minimal statistically detectable effect size
- ◯ Cohen's d thresholds
- ◯ not reported
- ◯ unclear

Effect size justification based on a previous study

17. What is the sample size of the "previous study"?

If the study used a previous study to justify the effect size of interest for the pre-study power analysis, what was the total sample size of the previous study?

_____

Pre-study power analysis

18. Report the intended power as a number between 0 and 1 (otherwise, leave empty)

This refers to the power that the researcher intends to achieve.

_____

19. Statistical software

Mark only one oval.

- G*Power
- R
- SAS
- other
- not reported

20. Select the key statistical test reported in the pre-study power analysis statement

Mark only one oval.

- paired t-test *Skip to question 22*
- unpaired t-test *Skip to question 22*
- one-way within-subject ANOVA *Skip to question 22*
- one-way between-subject ANOVA *Skip to question 22*
- two-way within-subject ANOVA *Skip to question 21*
- two-way between-subject ANOVA *Skip to question 21*
- two-way mixed ANOVA *Skip to question 21*
- other *Skip to question 22*
- unclear *Skip to question 22*
- not reported *Skip to question 22*

Effect of interest

21. Does the pre-study power analysis statement specify the effect of interest?

Mark only one oval.

- main effect
- interaction
- unclear
- not reported

Alpha level and key statistical test in study

22. Select the alpha level used for the pre-study power analysis

Mark only one oval.

- assumed two-tailed at 0.05
- two-tailed at 0.05
- one-tailed at 0.05
- one-tailed at 0.025
- two-tailed other
- one-tailed other
- not reported

23. Select the key statistical test reported in Methods/Statistical Analysis

Given the primary hypothesis and study design, select the statistical test used to test the independent variable(s)

Mark only one oval.

- paired t-test
- unpaired t-test
- one-way within-subject ANOVA
- one-way between-subject ANOVA
- two-way within-subject ANOVA
- two-way between-subject ANOVA
- two-way mixed ANOVA
- other
- unclear
- not reported

24. Does the statistical test reported in the pre-study power statement match any of the statistical tests reported in the Statistical Analysis section?

This refers to whether the statistical test reported in the pre-study power statement matches any o the statistical tests reported in the Statistical Analysis section. In case that one of the reported statistical tests is a *t*-test and the other one is one-way ANOVA with two factors, we will consider tl both statistical tests match as they are statistically equivalent.

Mark only one oval.

- yes
- no
- unclear

Do studies with a pre-study power analysis support the study hypothesis more often than studies without one?

25. Copy pasted quote of the primary hypothesis *

The primary hypothesis would be the one for which researchers controlled for both type I and type error rates– that is, besides presetting an alpha error, researchers conducted a pre-study power calculation. In the absence of a pre-study power calculation, the primary hypothesis will be the mo applicable to applied sport science.

26. Report the primary or key applied dependent variable *

the key applied dependent variable would be the one for which researchers controlled for both type and type II error rates– that is, besides controlling for type I error, researchers conducted a pre-stu power analysis to control for type II error. Thus, the key dependent variable should be listed in both pre-study power analysis statement and hypothesis statement. Furthermore, the key dependent variable can only be a single and specific variable, ideally matching the variable stated in the pre-study power analysis statement and hypothesis. If they don't match, we will select a single and specific applied variable listed in that order in: 1) hypothesis; 2) aim; 3) abstract; 4) title; 5) results.

27. Does the primary hypothesis predict the presence or the absence of an effect? *

Mark only one oval.

- effect
- null effect
- unclear

28. Does the study support the primary hypothesis? *

This applies to the the single and specific dependent variable selected above.
If the authors hypothesised a null effect, and the statistical result supports the hypothesis of null effect, this is considered support of the primary hypothesis

Mark only one oval.

- ◯ yes
- ◯ no
- ◯ unclear

29. Report final sample size

This refers to the total sample size collected for data analysis. If multiple experiments, report the sample size used to test the primary hypothesis.

_____

Reporting practices of statistical results

30. Copy pasted quote of the statistical result given the selected hypothesis and specific dependent variable.

Include descriptive statistics (mean and standard deviations) and test statistic, degrees of freedor effect size and its confidence interval)

_____

31. Based on the selected key dependent variable in the primary hypothesis, what is the effec of interest?

1- Difference of means (t-tests or Welch's test)
2- Main effect obtained from a factorial design
2- Interaction effect obtained from a factorial design: in a factorial design, the independent variable combine to have a different (and multiplicative) effect, such that the value of one is contingent upo the value of another. This indicates that the relationship between the independent variables chang as their values change. For example, if a researcher is investigating how gender (female vs. male) and diet (diet A vs. diet B) influence weight loss, an interaction effect would occur if women using Diet A lost more weight than men using Diet A.

Mark only one oval.

- ◯ difference of means *Skip to question 32*
- ◯ main effect *Skip to question 37*
- ◯ interaction effect *Skip to question 37*
- ◯ unclear *Skip to question 43*

t-test

32. Report degrees of freedom (otherwise, leave empty)

_____

33. Report t-statistic (otherwise, leave empty)

_____

34. Report the *p*-value (if not reported, leave empty)
Report p-value regardless of how it is reported (e.g., $p < 0.05$, $p = 0.034$)

_____

35. Is the effect size estimate standardised or unstandardized?

Mark only one oval.

- standardised
- unstandardised
- both types are reported
- not reported

36. Is the confidence interval of the effect size estimate reported?

Mark only one oval.

- yes, only for the standardised
- yes, only for the unstandardised
- yes, for both
- not reported

Skip to question 43

F-test

37. Report numerator degree of freedom (otherwise, leave empty)

38. Report denominator degree of freedom (otherwise, leave empty)

39. Report F-ratio (otherwise, leave empty)

40. Is the effect size estimate reported a standardised or unstandardized effect size?
If both types of effect sizes are reported, select standardised

Mark only one oval.

- standardised
- unstandardised
- not reported

41. Is the confidence interval of the effect size estimate reported?

Mark only one oval.

- yes
- no

42. Report the *p*-value (otherwise, leave empty)
Report p-value regardless of how it is reported (e.g., p < 0.05, p = 0.034)

Open Science practices

43. Has the study been preregistered? *

Mark only one oval.

- yes
- no

44. Does the study provide a link to a data repository where the raw data is publicly available?

Mark only one oval.

- yes
- no

45. Does the link work and the study data is available?

Mark only one oval.

- yes
- no