Supplement to Letter to the Editor Regarding Fleischer et al. Neurological Study Does Not Provide Any Evidence that Long COVID is Psychosomatic

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In our Letter to the Editor, we have focused on the main points of criticism. In addition, the article has other weaknesses regarding the statistical analysis.

Throughout the paper, only relative frequencies are given, and their calculation on the basis of the reported absolute numbers is not always obvious. There seem to be many badly rounded percentages. The specification of absolute numbers in addition to the relative numbers would have helped here. For example, many percentages in Table 1 are badly rounded and the corresponding absolute number is only clear up to +/- 1 participant. The table states “Previous psychiatric preconditions: 19.0%”. 19.0% of 171 participants would be 32.5 participants. Hence it is unclear, whether it were 32 (18.7%) or 33 (19.3%) participants. This also applies to “Allergies: 5.0%”. Are these 8 (4.7%) or 9 (5.3%) of 171 participants? In case of “Diabetes: 3.0%” and “Previous oncological conditions: 3.1%” it is unclear, how a difference of 0.1% can occur given 171 participants. Badly rounded percentages occur also in the text.

> "In the ‘‘Fatigue-Concentration cluster’’, almost half of the patients (48.0%) presented with deficits in three or more test dimensions, whereas this was the case in only 20% of patients in the ‘‘Headache cluster’’."

The “Fatigue-Concentration cluster” includes n = 60 patients. 48.0% of 60 would be 28.8 patients. 29 patients would be 48.3%. The Headache cluster consists of n = 46 patients. 20% of 46 would be 9.2 patients, whereas 9 of 20 patients would be 19.6%.

There are also imprecise and unclear descriptions in section “Statistical Analysis”.

> “Comparison of means was performed using Mann–Whitney U test, and analysis of multiple groups was performed using Kruskal–Wallis ANOVA with Dunn’s post hoc test after testing for parametric distribution with Shapiro–Wilk test."

The Mann-Whitney U-Test as well as the Kruskal-Wallis ANOVA are not comparing means, but mean ranks or more generally the location of groups. Moreover, Shapiro-Wilk is known as a test for normality. Hence it is unclear, which parametric distribution was tested by applying the Shapiro-Wilk test.

> "Correlations were analyzed by bivariate correlation and spearman’s rho."

Does this mean bivariate correlation by means of Spearman’s rho or does bivariate correlation refer to Pearson’s correlation? The numbers given in the article do not help to resolve this issue, since association/correlation is always abbreviated by r (not ρ), where r is rather used for Pearson’s sample correlation than Spearman’s rho.