Response to “Letter to the editor regarding: ‘Self-administered transcranial direct current stimulation for pain in older adults with knee osteoarthritis: A randomized controlled study’ ”

Drs. Silvia-Filho and Pegado raised some concerns about our recent publication [1] in their letter to the Brain Stimulation journal. However, with all due respect, their letter contains many conjectures and misunderstandings about statistics and/or our work.

First, we carefully examined the data distribution before subsequent analysis, so we used the appropriate parametric test for Gaussian variables and non-parametric test for non-Gaussian variables, respectively (see the “Data analysis” section). Drs. Silvia-Filho and Pegado specifically mentioned that “when the distribution is skewed, tailed, or unknown, the Wilcoxon Rank Sum test can provide greater statistical power”; however, this is exactly what we did in our study, so it is difficult to understand the point of this suggestion. Second, Drs. Silvia-Filho and Pegado raised another concern by saying that “attention is advised when interpreting results due to the transformation of the variable from mean to rank.” They partially understand how the Wilcoxon rank-sum test works as such test does use ranks instead of the original variable values. However, the Wilcoxon rank-sum test does not do “transformation for the variable from mean to rank,” and the related transformation (definitely not “from mean to rank” though) is internal within the test itself so it will not affect other analyses [2,3]. The use of non-parametric for non-Gaussian variables is a standard practice; therefore, it is difficult to understand how the use of non-parametric tests can be connected to their concern that “the clinical applicability of the findings should be approached with caution.” Third, there is another concern about “data are controversial because, in Fig. 2, standard deviations are evidently overlapping in all moments, but not clearly represented.” Standard deviation overlapping does not necessarily suggest that differences between groups are insignificant. Fourth, about “the standard error is a dispersion measurement … not between groups”, we presented Fig. 2 in this way according to our manuscript reviewers’ suggestions. Their concern about the use of standard error in Fig. 2 is largely a difference in personal preference between them and the manuscript reviewers. Fifth, the effect sizes were clearly reported in Table 2; therefore, it is not necessary to repeatedly report the same results also in Fig. 2. Finally, their concern of “The fact that the authors did not know the distribution of the data and decided to use a nonparametric test is an important limitation … prone to misinterpretation” is simply not a fact due to their lack of understanding of both our work and statistics.

It should be mentioned that, during the review process of the original manuscript, we have carefully addressed all the statistical concerns of the manuscript reviewers. Note that none of the reviewers raised any illegitimate concerns like those in this letter. We welcome any further discussions to shed light on our work, but the concerns in this letter are not evidence-based or accurate and therefore will do little to enhance scientific rigor. Rather, their letter as written is likely to mislead readers rather than inform them.

Table 2
Comparison of pain intensity changes between two groups at 3 weeks and 3 months from baseline.

| Variable     | Sham group (n = 60) | Active group (n = 60) | Effect size (d) | Wilcoxon-Statistic | P value |
|--------------|---------------------|-----------------------|-----------------|-------------------|---------|
| NRS Change (3-week) | -1.08 ± 1.64       | -24.07 ± 21.55        | 1.20            | 2879.5            | <0.0001 |
| NRS Change (3-month) | -0.43 ± 25.42      | -14.27 ± 24.94        | 0.55            | 2392.5            | <0.01   |
| WOMAC Change (3-week) | 10.56 ± 8.08      | -10.95 ± 14.20        | 0.23            | 2110              | 0.10    |
| WOMAC Change (3-month) | 14.64 ± 8.67      | -8.92 ± 16.35         | 0.02            | 1912.5            | 0.56    |

Note. Mean ± standard deviation is presented in the first two columns. NRS, Numeric Rating Scale; WOMAC, Western Ontario and McMaster Universities Osteoarthritis Index.

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Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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