

Statistical concerns about the study: hypoglycemic and antioxidant effect of Tai chi exercise training in older adults with metabolic syndrome

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Dear editor

In their study, Mendoza-Núñez et al studied the effect of Tai chi (TC) exercise on oxidative stress (OxS) in elderly with metabolic syndrome (MetS), with a painstaking study protocol.¹

They included a total of 85 older sedentary adults with MetS. The control group did not participate in physical exercise (n=37), and the experimental group was enrolled in a TC exercise training program (n=48). They measured in both groups, in the pre- and post-intervention periods, the cardiovascular parameters, OxS markers and inflammation markers. They concluded that a statistically significant decrease in HbA1c and a decrease in the OxS score were observed in the TC group compared with the control group. They did not observe changes in the cardiovascular parameters.

However, there seems to be a significant statistical error in the analyses section. They declared that to compare the frequency of OxS pre- and post-intervention, they used the chi-square test. However, importantly, they should have used the McNemar test as these are related samples, not independent samples.²

It has been shown that in analyses of paired data, use of the chi-square test is not acceptable. Instead, in analyses of paired measurements, one should use the McNemar test.^{3,4} In the three studies referred to by Mendoza-Núñez et al (the references 35–37 in the original paper), the authors did not use the chi-square test but used the McNemar test or some other tests suitable for the paired data.

On the other hand, regarding the effects of TC exercise on cardiovascular parameters, there are many published studies suggesting its favorable effects.^{5,6} Accordingly, we suggest that the analyses should be repeated with these concerns to have the actual results. This well-designed study which has some significant erroneous statistical analyses approaches.

Disclosure

The authors report no conflicts of interest in this communication.

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Authors' reply

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Dear editor

We greatly appreciate the interest of Aydın et al in reading and reviewing our recently published research “Hypoglycemic and antioxidant effect of Tai chi exercise training in older adults with metabolic syndrome”.¹ Aydın et al point out an error in the analyses section related to comparison of the frequency of oxidative stress (OxS) pre- and post-intervention, as we have used the chi-square test. Aydın et al also point out that we should have used the McNemar test as these are related samples, not independent samples. We agree

Table 1 Frequency of oxidative stress pre- and post-intervention

	Control		Tai chi	
	Baseline, n (%)	Six months, n (%)	Baseline, n (%)	Six months, n (%)
Without OxS	14 (38)	21 (57)	21 (44)	37 (77)
With OxS	23 (62)	16 (43)*	27 (56)	11 (23)**

Notes: McNemar's test was applied. * $p=0.5$; ** $p=0.004$.

Abbreviation: OxS, oxidative stress.

with this comment, so we did the statistical analysis again to compare the frequency of OxS pre- and post-intervention using the McNemar test and found that the statistically significant difference between the Tai chi and control groups was maintained (Table 1).

Regarding the second comment about the effects of TC exercises on cardiovascular parameters, we did the statistical analysis again and the results were verified without changes.

Disclosure

The authors report no conflicts of interest in this communication.

Reference

- Mendoza-Núñez VM, Arista-Ugalde TL, Rosado-Pérez J, Ruiz-Ramos M, Santiago-Osorio E. Hypoglycemic and antioxidant effect of Tai chi exercise training in older adults with metabolic syndrome. *Clin Interv Aging*. 2018;13:523–531.

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