

## Letter to the Editor

# Low 10-year reproducibility of glycaemic index and glycaemic load in a prospective cohort study: methodological and statistical issue to avoid misinterpretation

We were interested to read the paper by Mullie *et al.*<sup>(1)</sup> published in July 2018 issue of *British Journal of Nutrition*. The aim of the authors was to investigate the reproducibility of glycaemic index (GI) and glycaemic load (GL) using data obtained from a prospective cohort study with two nutritional assessments in 2002 and in 2012. For GI and GL, the reproducibility and cross-classification of quintiles between the two measurement periods were tested with Pearson's correlation coefficient<sup>(1)</sup>.

It is important to bear in mind that in all fields of research, validity (accuracy) and reliability (precision) are two important methodological issues that are completely different, and these issues are assessed using appropriate tests<sup>(2)</sup>.

Authors investigated the association of dietary GI and dietary GL in 2012 with dietary GL and dietary GI in 2002, respectively<sup>(1)</sup>. It refers to validity and has nothing to do with reliability<sup>(3)</sup>. Also, authors investigated the association of dietary GI and dietary GL in 2012 with dietary GI and dietary GL in 2002, respectively (that refers to reproducibility) using Pearson's correlation coefficient<sup>(1)</sup>. The Pearson correlation coefficients between 2002 and 2012 were 0.27 for GI and 0.41 for GL. For quantitative variables, applying Pearson's correlation and paired *t* test are among common mistakes in reliability (reproducibility) analysis<sup>(2)</sup>.

Pearson's correlation assumes that the relationships between variables are linear. So, it just measures linearity but fails to detect non-reliability (departure from the 45° line). Applying Pearson's correlation, high correlation coefficients are possible with far from reproducibility (reliability)<sup>(2)</sup>. Therefore, Pearson correlation coefficient is not an appropriate statistical test for reproducibility analysis. Briefly, weighted  $\kappa$  are good estimates for quantitative variables, intra-class correlation coefficient or Bland–Altman plot, and for qualitative variables with more than two categories<sup>(2–6)</sup>.

The authors mentioned that low 10-year reproducibility should be taken into account in prospective cohort studies with only one nutritional assessment at baseline.

In terms of reproducibility (reliability), such a sweeping conclusion may provide a misleading message. In conclusion, for reliability analysis, appropriate tests as well as correct

interpretation should be applied. Otherwise, misinterpretation cannot be avoided.

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