The stability of kinesiology-style manual muscle testing (kMMT) accuracy explored through reproducibility and repeatability: A round-robin diagnostic test accuracy study

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Introduction: Kinesiology-style Manual Muscle Testing (kMMT) has been used to accurately distinguish Lies from Truth\textsuperscript{[1-7]}; however, within these studies, the range of kMMT accuracies (40.0 to 91.7\%) was unexpectedly wide \textsuperscript{[1, 4]}. A diagnostic test is only considered valid if it is both accurate and precise; therefore, assessing the precision, or stability, of kMMT is an important next step. Stability was explored through assessing the reproducibility and repeatability of kMMT. In the context of kMMT, \textit{reproducibility} may be described as the degree of variability in kMMT accuracy between different Practitioners testing the same TPs, and \textit{repeatability}, the degree of variability in kMMT accuracy when a Practitioner tests the same TP at different times. Thus, the aim of this round robin diagnostic test accuracy study was to investigate the stability of kMMT accuracy through exploring its reproducibility and repeatability.

Methods: A prospective study of diagnostic test accuracy was carried out in a round-robin fashion. Sixteen Practitioners each tested 7 Test Patients (TP) using 20 kMMTs and 20 intuitive guesses (Intuition). Mean accuracies were calculated for each pair. Reproducibility and repeatability were assessed using ANOVA and Bland-Altman plots.

Results: Mean kMMT accuracy (95\% CI) was 0.616 (0.578 - 0.654), which differed significantly from mean Intuition accuracy, 0.507 (95\% CI 0.484 - 0.530; \textit{p}<0.01). Regression analysis revealed that kMMT accuracy could not be predicted by TP ($r$ = -0.14; \textit{p}=0.19), nor by Practitioner ($r$=0.01; \textit{p}=0.90). Significant effects of Practitioners and TPs individually and together were found (\textit{p}<0.05); however, together they account for only 57.0\% of the variance, with 43.0\% of the variance unexplained by this model. Bland-Altman Plots suggest satisfactory repeatability, and ANOVA demonstrated that variance could not be explained by temporal factors [$F(1,21) = 0.02$, \textit{p} = 0.90].

Summary: The variation in mean kMMT accuracy can be explained 57\% by participant characteristics, leaving 43\% unexplained. There are other factors at play that could not be predicted by this model; therefore, additional research is needed.
References:


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