Comparing Distribution-Based and Anchor-Based Minimal Clinically Important Difference Values for Temporomandibular Disorder

Megan Elizabeth Ingram, B.S.

The University of Texas Southwestern Medical Center at Dallas, 2011

Supervising Professor: Robert J. Gatchel, Ph.D., ABPP

Available after 9/1/2011

Keywords: minimal clinically important difference; temporomandibular disorder; minimal detectable change, TMD; outcome measure

 The current study is a continuation of studies by Gatchel and colleagues. Data were collected from 101 patients at several community dental clinics. Based on the patients' initial evaluations, they were randomly assigned to one of three treatment groups: Low Risk/Non-intervention Group; High Risk/Biobehavioral Group; or High Risk/Self-Care Group.

 This study attempted to better understand and objectively quantify meaningful symptom relief by determining the minimal clinically important difference (MCID) for temporomandibular joint disorder (TMD). Despite limitations and controversy with determining the most appropriate method, this information will play an important role in determining treatment effectiveness for not only TMD, but for other pain conditions as well. The most commonly referenced methods for determining meaningful change are the distribution- and anchor-based approaches. Distribution-based minimal detectable change (MDC) values were calculated using the formula 95% CI=1.96 x Square Root(2) x SEM, while the anchor-based approach minimal clinically important change (MCID) values were calculated using a Receiver Operating Curve (ROC). Both mean particle size and broadness of distribution served as two separate functional anchors, and normal range and .5 SD as two separate cutoff methods.

 Despite some variability, the MCID values were relatively consistent with the MDC values regardless of method, anchor, or cutoff for both the Physical Component Scale (PCS) and Mental Component Scale (MCS) of the SF-36. The Characteristic Pain Inventory and Graded Chronic Pain Scale showed a narrow range of variation within the MCID values; however, the MCID values calculated were significantly higher than the MDC values reported for the same measures.

 Findings indicated that the PCS component of the SF-36 provided stronger evidence of clinically meaningful change. The PCS resulted in asymptotic values closer to .1 (at the 90% confidence interval) with areas under the curve that better fit the model compared to the other subjective measures (considered fair at .701 when using the normal range and .740 when using .5SD for the Biobehavioral Group). Additionally, broadness of distribution resulted in more clinically meaningful changes as a result of better metric values when comparing the biobehavioral versus the self-care groups.