Western Ontario Rotator Cuff Index

Description

The Western Ontario Rotator Cuff Index (WORC) is a condition-specific self-reported instrument to assess ‘quality of life’ (QoL) (Kirkley et al 2003). It consists of 21 visual analog scale (VAS) items organised in 5 subscales: physical symptoms, sports/recreation, work, lifestyle, and emotions. It was developed by a clinimetric process. The origins of the subscale structure were not established by a factor analysis; and are similar to those contained on instruments developed by the same author for other shoulder conditions (osteoarthritis and instability) (Lo et al 2001). The WORC has been translated and validated in several languages.

Instructions to client and scoring

Patients are asked to indicate on a 100-mm line, anchored at the beginning and at the end, the extent to which the symptom or disability is experienced over the past week referring to the problematic shoulder. Phrases like ‘no pain’ and ‘extreme pain’, ‘no weakness’ and ‘extreme weakness’, ‘no difficulty’ and ‘extreme difficulty’ which explained the extremes of a particular item measured, were used as anchors.

Each item in WORC has a possible score from 0–100 (100 mm VAS). Scores can be computed for individual subscales and summated for a total score, which can range from 0–2100, with a higher score representing lower quality of life. To present this in a more clinically meaningful format, the distance from the left side of the line is measured and recorded to the nearest 0.5 mm, calculated for a score of out of 100, and summed for each subscale (physical symptoms/600, sports and recreation/400, work/400, lifestyle/400, and emotions/400). The subscale scores are summed and reported as a percentage of normal by subtracting the total from 2100, dividing by 2100, and multiplying by 100 (Kirkley et al 2003).

Commentary

Shoulder problems, rotator cuff conditions in particular, are common musculoskeletal disorders with a high socioeconomic effect. The incidence of shoulder complaints in general practice is 22 per 1000 patients per year (Sobel et al 1996). Rotator cuff conditions comprise 44% to 65% of these shoulder complaints (Koester et al 2005). Young athletic people and active members of society are often affected (Cohen et al 2007).

The 21 item WORC questionnaire covers the physical symptoms due to rotator cuff pathology and its effect on different domains of life—sports/recreation, work, lifestyle, and emotions. There is a small pool of studies addressing its clinical measurement properties which have generally been supportive indicating that WORC is a reasonably valid and reliable tool to measure the health related quality of life in patients with rotator cuff pathology. Head-to-head comparisons are needed to establish whether it is preferable to other shoulder questionnaires which are generally shorter; and whether a disease-specific QoL tool is needed as an alternative to shoulder-specific scales that are currently used across a number of conditions.

Reliability, validity and responsiveness

The WORC has demonstrated good test-retest reliability across several studies (ICCs 0.84 to 0.96) (Kirkley et al 2003, Ekeberg et al 2008, de Witte et al 2012). The construct validity of WORC as determined by comparison to other disability instruments has been supported (Longo et al 2011). The WORC correlates with the American Shoulder and Elbow Surgeons score (ASES) ($r = 0.68$) and the Disabilities of the arm, shoulder and hand (DASH) ($r = 0.63$) (Kirkley et al 2003). Factor validity of the 5-domain structure of WORC has been questioned. In one study 3 factors (symptoms and emotional items, strength items, daily activities) were identified representing 57% of variance (Wessel et al 2005).

Studies on responsiveness support the use of WORC questionnaire in clinical trials or patient evaluation to measure changes in pain and related disability after rotator cuff repair. The WORC was able to detect change in functional status of surgical patients (regardless of type of surgery) with rotator cuff pathology in two studies (Holtby et al 2005; de Witte et al 2012). The WORC was more responsive than other measures like SST (Simple Shoulder test), DASH, and SF-36 (The Short Form 36 Health Survey). A recent study comparing the responsiveness of WORC with other shoulder specific measures like SPADI (Shoulder Pain and Disability Index) and OSS (Oxford Shoulder Scale) reported that WORC had higher point estimates of responsiveness, but did not identify significant differences in responsiveness between the disease-specific WORC index and the region specific SPADI and the OSS (Ekeberg et al 2010).

References