Reliability and Validity of the WorkHab Functional Capacity Evaluation

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This thesis is submitted in fulfilment of the requirements for the
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School of Health Sciences
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Statement of Originality

This thesis contains no material which has been accepted for the award of any other degree or diploma in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text. I give consent to this copy of my thesis, when deposited in the University Library, being made available for loan and photocopying subject to the provisions of the Copyright Act 1968.
Thesis by publication
Acknowledgement of Authorship

I hereby certify that this thesis is in a form of a series of published papers of which I am a joint author. I have included as part of the thesis a written statement from each co-author, endorsed by the Faculty of Health Assistant Dean (Research Training), attesting to my contribution to the joint publications. These can be found in Appendix 1.

Signed: ______________________________

Carole James

Date: ____________
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Publications arising from work presented in this thesis

Refereed Journal publications:


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Conference paper presentations:


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# Abbreviations

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<td>AWP</td>
<td>Assessment of Work Performance</td>
</tr>
<tr>
<td>BOH</td>
<td>Bench to Overhead</td>
</tr>
<tr>
<td>BS</td>
<td>Bench to Shoulder</td>
</tr>
<tr>
<td>BTE</td>
<td>Baltimore Therapeutic Evaluation</td>
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<tr>
<td>CLBP</td>
<td>Chronic Low Back Pain</td>
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<tr>
<td>DOT</td>
<td>Dictionary of Occupational Titles</td>
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<tr>
<td>DVD</td>
<td>Digital video disc</td>
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<tr>
<td>EMG</td>
<td>Electromyography</td>
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<tr>
<td>FAST</td>
<td>Functional Assessment Screening Test</td>
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<td>FB</td>
<td>Floor to Bench</td>
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<tr>
<td>FCE</td>
<td>Functional Capacity Evaluation</td>
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<tr>
<td>GAPP-FCE</td>
<td>Gibson Approach to Functional Capacity Evaluation</td>
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<tr>
<td>Hz</td>
<td>Hertz</td>
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<tr>
<td>ICC</td>
<td>Intra-class Correlation</td>
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<tr>
<td>ICF</td>
<td>International Classification of Functioning, Disability and Health</td>
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<tr>
<td>IDR</td>
<td>Instrument for Disability Risk</td>
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<td>IWS</td>
<td>Isernhagen Work Systems</td>
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<tr>
<td>LBP</td>
<td>Low Back Pain</td>
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<td>mV</td>
<td>Millivolts</td>
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<tr>
<td>MVC</td>
<td>Maximum Voluntary Contraction</td>
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<tr>
<td>NIOSH</td>
<td>National Institute for Occupational Health and Safety</td>
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<tr>
<td>NSW</td>
<td>New South Wales (Australia)</td>
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<tr>
<td>OT</td>
<td>Occupational Therapist</td>
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<tr>
<td>PDI</td>
<td>Pain Disability Index</td>
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<tr>
<td>PILE</td>
<td>Progressive Isoinertial Lifting Evaluation</td>
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<td>PWPE</td>
<td>Physical Work Performance Evaluation</td>
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<tr>
<td>RMS</td>
<td>Root Mean Square</td>
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<td>RTW</td>
<td>Return to Work</td>
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<td>RWL</td>
<td>Recommended Weight Limit</td>
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<td>SD</td>
<td>Standard Deviation</td>
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<td>SEMG</td>
<td>Surface Electromyography</td>
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<td>SML</td>
<td>Safe Maximal Lift</td>
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<td>UK</td>
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<tr>
<td>WRULD</td>
<td>Work-related Upper Limb Disorder</td>
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<td>Work Well Systems Functional Capacity Evaluation</td>
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<td>VAS</td>
<td>Visual Analogue Scale</td>
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Thesis Abstract

Functional Capacity Evaluations (FCEs) are part of practice in occupational rehabilitation, and are designed to define an individual’s functional abilities in the context of safe, productive work tasks. The WorkHab Functional Capacity Evaluation is one of many currently available FCEs. It is commonly used in Australian occupational rehabilitation: however, there is a lack of evidence of its psychometric properties. This thesis reports on research that investigated reliability and aspects of validity of the WorkHab FCE.

The current practice of FCE use in the Australian occupational rehabilitation context was investigated. Qualitative and quantitative methodology were used to study the perceptions and practices of health professionals about the use and clinical utility of FCE’s. Results found health professionals use more than one FCE, with the WorkHab FCE the second most commonly used in NSW Australia. There was consistency and similarities in FCE use in practice, with participants adapting FCEs to suit the situation and completing parts rather than the whole of a FCE.

Four studies subsequently investigated the measurement properties of the WorkHab FCE. The manual handling components were evaluated, including test-retest reliability in healthy adults, and intra-rater and inter-rater reliability using DVD footage of injured workers FCEs. Content validity was evaluated using a cross sectional survey of health professionals who use FCEs in practice. Construct validity of the bench to shoulder lift was explored using Electromyography (EMG) to study muscle activity in the upper body.
Results found substantial levels of test-retest reliability and intra-rater and inter-rater reliability for the lifting components of the WorkHab FCE. The findings support content validity for the WorkHab FCE specifically in relation to manual work and vocational retraining; however, construct (convergent) validity of the safe maximal lift of the bench to shoulder lift of the WorkHab FCE was unable to be established using EMG physiological parameters.

Future directions for research of the WorkHab FCE and implications for clinical practice are discussed.