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Functional Capacity Evaluation Research: Report from the Second International Functional Capacity Evaluation Research Meeting. — Source link

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Functional Capacity Evaluation Research: Report from the Third International Functional Capacity Evaluation Research Meeting

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Abstract

Purpose:

Based on the success of the first 2 conferences the Third International FCE Research Conference was held in The Netherlands on September 29, 2016. The aim was to provide ongoing opportunity to share and recent FCE research and discuss its implications.

Methods:

Invitations and call for abstracts were sent to: previous attendees, researchers, practicing FCE clinicians and professionals. 15 abstracts were selected for presentation. The FCE research conference contained two keynote lectures.

Results:

54 participants from 12 countries attended the conference where 15 research projects and 2 keynote lectures were presented. The conference provided an opportunity to present and discuss recent FCE research, and provided a forum for discourse related to FCE use. Conference presentations covered aspects of: practical issues in administration and interpretation; protocol reliability and validity; consideration of specific injury populations; and a focused discussion on proposed inclusion of work physiology principles in FCE testing with the Heart Rate Reserve Method. Details of this Third International FCE Research Conference are available from: http://repro.rcnheliomare.nl/FCE.pdf.

Conclusions:

Researchers, clinicians, and other professionals in the FCE area have a common desire to further improve the content and quality of FCE research and to collaborate to further develop research across systems, cultures and countries. A fourth, 2-day, International FCE research conference will be held in Valens, Switzerland in August or September 2018. A 'FCE research Society' will be developed.

Keywords

Functional capacity evaluation, Work assessment, Disability evaluation.

Background

Functional Capacity Evaluations (FCE) are performance-based assessments designed to determine current capacity to perform activities while considering the individual's body structures and functions, environmental and personal factors, and health status. FCEs are used in occupational, insurance and rehabilitation medicine in order to evaluate work ability. Various FCE protocols are used and may differ in purpose, but typically the evaluations play a role in facilitating work reintegration.

Research in the field of FCE has developed in the past decades with growing evidence on the reliability, validity, and clinical utility of FCE within different patient populations as well as in healthy workers. FCE research is taking place in different societal contexts where researchers operate, with FCE results possibly being influenced by cultural context, system context, and with different influences from psychosocial factors. This can lead to challenges in generalizability or transferability of FCE results. Fortunately, since 2012, there has been a platform for FCE researchers to present their findings, discuss implications, and collaborate. Since the 1st and 2nd International FCE Research Conference in 2012 and 2014, FCE related research has continued to grow [1,2]. The aim of the 3rd FCE research conference was to provide ongoing opportunity for the presentation of current FCE research and a forum for discussion of FCE use.

Report

The 3rd International FCE Research Conference was held in Wijk aan zee, The Netherlands on September 29, 2016 following the Work Disability Prevention and Integration Conference (WDPI) in Amsterdam. Invitations to the conference were sent to: previous attendees from the 1st and 2nd conference; researchers who have published studies related to FCE; practicing FCE clinicians, researchers and (occupational or vocational rehabilitation) professionals; and FCE protocol developer networks. The conference was also advertised on the WDPI conference events calendar. Following a call for abstracts by a scientific committee, 15 abstracts were selected for presentation. The FCE research conference contained two keynote lectures; 1) Functional Capacity Evaluation in different societal contexts: Results of a multicountry study, and 2) Practical Issues in FCE Administration and Interpretation: Lessons Learned From Thousands of Cases. 54 Participants from 12 countries (Australia, New Zealand, Canada, Finland, Germany, South Africa, Switzerland, Spain, USA, UK, The

Netherlands, Belgium) attended the conference. Apart from the scientific program, there was opportunity for networking and collaboration amongst the international FCE participants.

The conference began with an update relating to the FCE research agenda identified at the 2nd International FCE Research Conference 2 years prior [2]. Next, results of an study of FCE in different societal contexts was addressed by the first keynote speaker, Jone Ansuategui Echeita from Bilbao, Spain and Groningen, The Netherlands. This study had been initiated at the Toronto FCE meeting. Results indicated that FCE performance is associated with various biopsychosocial factors, and the identified factors differed from previous studies performed within specific societal contexts. Results indicate patients' FCE performance should be interpreted within a biopsychosocial framework. The second keynote speaker, Jill Galper, from Philadelphia, USA, presented and discussed 'Practical Issues in FCE Administration & Interpretation: Lessons Learned From Thousands of Cases'. She discussed common administrative and interpretation errors and made recommendations for the overall improvement of FCE reporting. It is clear that FCE protocols differ between models on components such as the history and interview, how clinical exam data is reported and correlated with functional performance, inclusion of rationale, inclusion of submax aerobic tests, as well as individual activity tests within protocols.

Individual abstract presentations included:

A critical review of grip strength dynamometry related to work ability was presented by Lisa Fitzpatrick from the USA. The results of this study suggest that grip strength has a mild to strong positive relationship with work ability and work performance. However, the literature does not yet provide sufficient evidence on the extent to which grip strength predicts work performance or work ability.

Catherine Albert from the United Kingdom discussed the Association of Chartered Physiotherapists in Occupational Health and Ergonomics (ACPOHE) functional testing toolkit that has been developed by physiotherapists in the United Kingdom (http://www.acpohe.org.uk). The Function Testing toolkit is comprised of 22 tests. The toolkit includes a test summary, test procedure, normative data and scoring sheet. The functional testing toolkit provides a set of evidence based functional tests that

therapists can use during routine clinical assessments. The aim is to provide measures supported by evidence to inform fitness to work recommendations.

Peter Oesch, from Switzerland, reported a study of the performance of patients with chronic non-specific low back pain with and without Waddell signs.[3,4] This presentation highlighted that Waddell Signs should be assessed for accurate interpretation of FCE results. Despite long work absence, patients with chronic non-specific low back pain with negative Waddell Signs demonstrated a physical capacity corresponding to substantial physical work demands. It was discussed that Waddell signs testing and determination of physical effort using observational criteria should not be interchangeably used for interpreting lifting performance during FCE. A comprehensive assessment to screen for high levels of pain behavior should include a variety of different aspects of pain behavior such as: pain perception and description by the patient, the behavior of the patient perceiving pain, the patient's effort to perform physical tests, and the patient's consistency of behaviour. Despite promising results for the validity of the observational criteria applied during FCE, further research on 'physical effort evaluation' is needed.

Jan Kool from Switzerland presented the development and validation of a pain behaviour assessment in patients with chronic low back pain.[5] High levels of pain behaviour adversely affect the success of multidisciplinary rehabilitation of patients with Chronic Non-Specific Low Back Pain. FCE assessors should detect high levels of pain behaviour to prevent the inclusion of unsuitable patients into functional rehabilitation programs. The Pain Behaviour Assessment is a useful assessment tool to describe pain behaviour in patients with low back pain and may help to screen patients for high levels of pain behaviour.

Maurizio Trippolini from USA, presented a study on the ability of the Spinal function Sort (SFS) to predict future work status in patients with non-specific low back pain within a Swiss rehabilitation setting.[6] The SFS consists of 50 depicted items, which are linked to demonstrable, specific work-related tasks that involve the spine. The SFS has shown to be useful in addition to FCE. The SFS has been translated and validated in different languages and is used in several countries. Based on the results of this mixed methods study, a modified and shortened SFS was developed. This consists of

12 items from the existing SFS and 8 new items that include postures and movements believed to cause back pain. Measurement properties of the modified SFS need to be explored in future studies.

Sietke Postema from the Netherlands discussed the development of a FCE measurement for individuals with upper limb reduction deficiency or amputation. Due to the general young age of individuals with upper limb absence, which means they have many working years ahead of them, and their high risk on musculoskeletal complaints, an FCE for these individuals is warranted. The FCE-OH was designed to test the functional capacity of the upper extremities of one-handed individuals in a standardized environment, with or without a prosthesis,. The FCE will enable rehabilitation physicians and therapists to assess the physical capacity of an individual with ULA and give them substantiated advice regarding suitable work, and return or continuation of work. Results of the overhead lifting test were significantly influenced by the one-handedness of the participants. This was followed by a presentation of musculoskeletal complaints which are twice as prevalent in persons with an upper limb amputations compared to the general population. Overuse of the sound limb or compensatory movements of the affected limb may explain this difference. A feasible scoring system was developed to assess compensatory movements in upper limb prosthesis wearers when executing FCE-OH tests. Intrarater reliability was good, interrater reliability was satisfactory in most instances. The standardized scoring system for assessing compensatory upper limb movements during performance of FCE-OH tests may provide clinicians with useful information for prevention and treatment of musculoskeletal complaints in upper limb prosthesis wearers.

Jesse Karpman from Canada discussed the question: ‘Do Wearable Fitness Devices Correlate With Performance-Based Tests of Work-Related Functional Capacity?’ The use of wearable accelerometers in conjunction with FCE may provide additional useful information about day-to-day function or maximum performance in workers. However, little research has been conducted to compare FCE performance with accelerometer output. With the rapid development of these products and the widespread acceptance in the general population, it is important to determine if, and how they can be introduced into clinical practice. Studies to date identified that waist placement of a triaxial accelerometer device appears to be more optimal than the wrist placement, with stronger correlations observed. Results indicate that Actigraph device output correlated moderately with maximum

performance on FCE lift and ambulation tests. Waist placement appears more suitable than wrist during performance-based tests. Actigraph devices may be useful during FCE evaluations and add another quantitative indicator of performance.

Marika Lassfolk from Finland proposed that the field of FCE lacks common terminology and language. Due to inconsistent terminology, experts have agreed on using the International Classification of Functioning, Health and Disability (ICF) as the conceptual framework for FCE. The objectives of the study were to translate the Spinal Function Sort questionnaire into Finnish and Swedish, link FCE tests to the comprehensive ICF core set of vocational rehabilitation and to evaluate how precisely it is possible to describe the level of functioning of a person with low back pain using this core set. [7] This research will provide a Finnish and Swedish translation of the Spinal Function Sort. ICF linked FCE tests would provide a common language to facilitate communication among evaluators from different disciplines, make it possible to compare data, both between countries and between different institutions as well as over time.

Mattias Bethge from Germany presented on work-related medical rehabilitation (WMR), an intervention to improve and to restore work ability in patients with an increased risk of permanent work disability.[8] FCE is a major component of WMR. The current WMR guideline recommends a short FCE at admission in order to establish the rehabilitation plan. This study examined how floor-to-waist lifting results (premature test termination, lifted weight) are associated with self-rated return-to-work-prognosis. Results indicate patients with a poor return-to-work prognosis had significantly lower lifting scores. Moreover, multivariate analysis showed that weight lifted was a stronger predictor of poor return-to-work prognosis than pain and self-rated work ability. FCE adds clinically meaningful data in order to understand poor return-to-work prognosis even if the test is terminated prematurely.

Paul Kuijer from the Netherlands presented study results demonstrating that performance-based tests have additional prognostic value over self-reported work ability for sustainable return to work (RTW) in physically demanding work.[9] Associations of lifted weight and self-rated return-to-work prognosis of workers with a high risk of permanent work disability may be useful to support individuals to access and utilize rehabilitation services. One assessment that was developed for this purpose is the Work

Ability Index, which assesses the degree to which a worker considers their state of health as being adequate to cope with their job demands. Self-reported work ability as assessed by the WAI is being used to predict disability pensions and rehabilitation events. Results indicate that combining self-reported work ability and a lifting test nearly doubled the explained variance for sustainable RTW in physically demanding work, although the strength remained modest. An animated session by P. Kuijer followed that discussed if a self-report on work ability in combination with FCE was a better predictor for sustainable return to work than a self-report only, specifically in construction workers on sick leave due to musculoskeletal disorders.

David Bühne from Germany presented that the FCE is most commonly used within the work-related medical rehabilitation to assess the physical capacity of a patient in relation to a specific workplace. Even so, there is still less evidence concerning predictive validity of FCE. The aim of the study was to determine the ability of a short-form FCE, in which the selection of specific FCE-tests is based on the subjective workplace-related strain, to predict sustainable return to work (RTW). In this multicentre prospective cohort study the predictive validity of a workplace-specific and strain-related short-form Functional Capacity Evaluation in patients with musculoskeletal disorders was presented. Sustainable RTW can be predicted using a workplace-specific and strain-related short-form FCE in patients with musculoskeletal disorders.

From Spain, Joaquim Chaler presented upper limb isokinetic strength assessment applicability in work injury patients.[10] Work Related Upper Limb Injuries are a major concern in rehabilitation settings. Isokinetic strength assessment may be a central part of the rehabilitation process as well as permanent impairment evaluation.

During the last presentation by Whitney Ogle and Theodore Becker from USA, a facilitated discussion occurred about the use of heart rate data in determining full time work tolerance during FCE testing. FCE are a standard and customary process for the determination of tolerance for full time work after injury. Regardless of own-design or commercial FCE packages, there is an expectation that protocols are scientifically substantiated. Analysis of Heart Rate Response (HRR) to activity is not currently a standard method in the determination of full time work tolerance in most FCE protocols. This study

illustrated the importance of including the HRR formula in FCE protocols for the appropriate, evidence-based determination of work tolerance after injury. Inclusion of the HRR method in FCE protocols was recommended as an essential factor for the accurate determination of work tolerance, but has been inconsistently reported across FCE methods. This was followed by open discussion related to greater inclusion of work physiology principles in FCE testing and how to evaluate this in ongoing FCE research.

Discussion

The enthusiasm, lively, and critical discussion after each presentation was encouraging. The presentations showed the differences and variability of FCE use but also the commonality of FCE use across cultural and system contexts. Details of this Third International FCE Research Conference are available from: http://repro.rcnheliomare.nl/FCE.pdf. Interested readers can respond directly to the authors for more information.

Future Directions

Based on the success of the first 3 conferences, attendees have agreed to meet again. A fourth, 2-day, International FCE research conference will be held in Valens, Switzerland in August or September 2018. Details of this meeting will be published and distributed to the international network of FCE professionals and will also be available directly from the authors. Another outcome of this FCE conference is to instigate the development of a 'FCE research Society' and 'an international logo'. This society will initially begin informally as a website and communication forum. This FCE website will also be used for further discussions relating to the next FCE conference in 2018.

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Conflict of interest.

Edelaar, James, Gross and Reneman declare they have no conflict of interest.

Ethical standard.

The scientific conference included no data collection, so ethics approval was not pursued.

References

1. Reneman MF, Soer R, Gross DP. Developing research on performance- based functional work assessment: report on the first international functional capacity evaluation research meeting. J Occup. Rehabil. 2013;23(4):513–5.
2. James CL, Reneman MF, Gross DP. Functional Capacity Evaluation Research: Report from the Second International Functional Capacity Evaluation Research Meeting. J Occup. Rehabil. 2016 Mar;26(1):80-3.
3. Oesch P, Meyer K, Bachmann S, Hagen KB, Vollestad NK. Comparison of two methods for interpreting lifting performance during functional capacity evaluator. Phys Ther. 2012 Sep;92(9):1130-40.
4. Oesch P, Meyer K, Jansen B, Kool J. Functional Capacity Evaluation: Performance of Patients with Chronic Non-specific Low Back Pain Without Waddell Signs. J Occup Rehabil. 2015 Jun;25(2):257-66.
5. Meyer K, Klipstein A, Oesch P, Jansen B, Kool J, Niedermann K. Development and Validation of a Pain Behavior Assessment in Patients with Chronic Low Back Pain. J Occup. Rehabil. 2016 Mar;26(1):103-13.
6. Janssen S, Trippolini MA, Hilfiker R, Oesch P. Development of a Modified Version of the Spinal Function Sort (M-SFS): A Mixed Method Approach. J Occup. Rehabil. 2016 Sep;26(3):253-63.
7. Escorpizo R, Reneman MF, Ekholm J, Fritz J, Krupa T, Marnetoft SU, Maroun CE, Guzman JR, Suzuki Y, Stucki G, Chan CC. A conceptual definition of vocational rehabilitation based on the ICF: building a shared global model. J Occup Rehabil. 2011 Jun;21(2):126-33.
8. Neuderth S, Schwarz B, Gerlich C, Schuler M, Markus M, Bethge M. Work-related medical rehabilitation in patients with musculoskeletal disorders: the protocol of a propensity score

matched effectiveness study (EVA-WMR, DRKS00009780).BMC Public Health. 2016 Aug 17;16:804.

9. Kuijer PP, Gouttebarge V, Wind H, van Duivenbooden C, Sluiter JK, Frings-Dresen MH. Prognostic value of self-reported work ability and performance-based lifting tests for sustainable return to work among construction workers. Scand. J Work Environ Health. 2012 Nov;38(6):600-3.
10. Chaler J, Pujol E, Unyó C, Quintana S, Müller B, Garreta R, Javierre C, Dvir Z.. Maximally of shoulder external rotation effort in patients presenting with work related injury: the clinical applicability of the DEC parameter. J Electromyogr. Kinesiol. 2013 Aug;23(4):865-71.