



ORIGINAL RESEARCH PAPER

Orthopaedics

THE DEVELOPMENT THE RELIABILITY OF OCCUPATIONAL THERAPY FUNCTIONAL CAPACITY EVALUATION INDEX (OT FCE INDEX) A SCREENING TOOL IN MUSCULOSKELETAL CONDITIONS

KEY WORDS: Occupational Therapy (OT), Functional Capacity Evaluation (FCE), Musculoskeletal condition , Fractures.

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ABSTRACT

Objectives: The development the reliability of Occupational Therapy Functional Capacity Evaluation Index (OT FCE Index) a Screening tool in Musculoskeletal conditions

Methods: There is a need for comprehensive evaluation of diverse aspects of physical demands in people with different occupation and with different Musculoskeletal conditions. To develop a comprehensive assessment scale to evaluate physical demands in different occupations among patient with fractures and to assess its reliability. To establish the construct validity of OT FCE Index, 104 patients with fractures was comparing on different levels of occupation, use of limbs, occupational demands and types of works. To establish

test-retest reliability 30 respondents were reassessed after two weeks

Result: The instrument was found to have good internal consistency (Cronbach's alpha =0.95). The test-retest reliability (intra-class correlation coefficient = 0.96, p <0.001) were found to be good.

Conclusion: OT FCE Index seems to be a promising and reliable tool to assess the physical demands of patient with fractures with relation to their occupation. It may contribute significantly to a comprehensive guide for intervention in rehabilitation programs.

INTRODUCTION

Musculoskeletal disorder is prevalent among the general population which causes multiple disabilities. Although the disease usually is not life-threatening, the patients affected with them constitute a large fraction, perhaps the largest of patients treated in clinical practice and they are significantly disabled to engage in productive activities because musculoskeletal disorders (MSDs) can affect the body's muscles, joints, tendons, ligaments and nerves (World Health Organization, 2006).

In India MSDs as a significant health care burden, high percentage of amount spent on treatment of MSDs during 2012 year, within the screened positive population, absence from work for one week or more was found, this contributes to loss in GDP at the national level. (Epidemiology of Musculoskeletal Conditions in India, Dr Rajendra Sharma, S.J.H. Final Project Report 2012) Hence musculoskeletal disorder not only makes one disable physically but also imposes heavy economic burden and stress too. This has direct or indirect impact on the economy of the country.

The FCE stands alone as a one time evaluation, it measures a patients performance against given criteria to predict his or her potential to engage in work. The criteria against which measurement are made may be job specific, as in case injured worker who may virtually return to his her job. It has become widely used in occupational, insurance, and rehabilitation medicine to evaluate work ability and to guide return-to-work recommendations (Gross, Battie, & Cassidy 2004; Soer, van der Schans, Groothoff, Geertzen, & Reneman, 2008).

OTs use the framework provided by the FCE to guide their observations of the patient's performance and decision-making about the patient's physical capacity for return to work, including any major limiting factors and the barriers and facilitators for return to work. A key aspect of the FCE is its incorporation of evaluation of the worker's perceived capacities for return to work, found to be crucial for the outcome of returning to work (Schult et al., 2000). Thus, occupational therapists have become one of the major providers of FCE (Gibson & Strong, 2003). In this study we are trying to develop norms of OT FCE Index for Orthopaedic problems specifically in fractures; whether an OT FCE index is useful to complement an expert assessment or not, which cannot be answered until the psychometric properties of expert assessments are known and the strength of the relationships discovered.

METHODOLOGY

Screening Tool Development

The screening tool was mainly developed to aid an Occupational therapist to use to screen out for job specific physical demands. This were use to determine the specific information from the patient about their job and description of job in detail with respect to physical demand levels. And also help to reduce time to administered the job specific Functional capacity evaluation.

Item included

The items were then broadly categorised into five domains, namely, Dynamic Load handling consist of 12 physical demands; Postural tolerance consist of 7 physical demands; Postural flexibility consist of 14 physical demands; Postural Mobility consist of 4 physical demands; Gross and Fine skills consist of 9 physical demands.

The domain of 'Dynamic Load Handlings' were included more common physical demands those used commonly during any job or work. It consists of Power grip, Pushing, Pulling, Carrying, and Lifting.

The domain of 'Postural tolerance' was included the routine sustain posture required during any job and work. Its consist of tolerance of Standing, Sitting, Walking, Squatting, Kneeling, Crouching. As per the Indian context we were included the Sustain Cross Leg Position which is commonly practice during the work.

The domain of 'Postural flexibility' was included the more off body movement like reaching, rotation and bending for job or work; its also includes ability alter the position, kneel down and squat down. This domain signifies more trunk movement with respect to limbs and static balance.

The domain of 'Postural Mobility' was included to change the body position from one place to other that's is walking, climbing and crawling. This was consist of lower limb functions.

The final domain of Gross and Fine skills was included the hand dexterity like fingering, handling, & twisting or alternate wrist movements; hand strength like pinch and key grip strength; Foot control operation is specific demand of work or job and Balance to maintain posture upright during job or work.

Scoring.

Five-point scale was formulated for assessment with 0 indicating

Not Applicable and 1 to 5 suggesting able to do, mild restricted, moderately restricted, severely restricted and unable to do respectively.

Precise words without jargon were used in the scoring key so that ambiguity and vagueness could be avoided. Items formulated were specific and with a single idea to prevent confusion

Conduction of study

The 104 consecutive patients attending the occupational therapy programme, aged between 18 and 60 years of age who gave written informed consent.

Patients with a clinical diagnosis of Musculoskeletal Dysfunctions specifically fractures were included in study.

Patient with chronic unstable co-morbid medical conditions like pregnancy, psychiatry illness, and severe cardiac dysfunction and communication barriers or difficulty to understand or follow instructions were excluded from the study.

Occupational Therapy Functional Capacity Evaluation (OT FCE) Index was scored by Occupational Therapists concurrently to assess reliability. It was also scored again after 2 weeks to assess test-retest reliability on 30 patients.

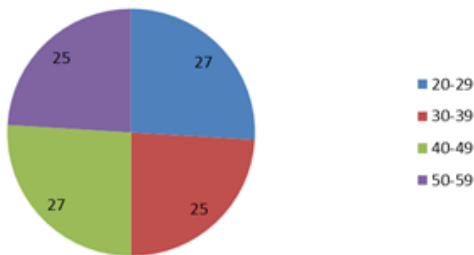
RESULTS AND OBSERVATIONS

A total of 133 patients were initially recruited for study but due to poor follow up 29 patients were dropped out from the study. This study was done on 104 adult patients which consisted of 72 males and 32 females, Mean age was 38.7 ±11.2 years. (As shown in Table 1); as further they classified in various age group that is 20-29, 30-39, 40-49, 50-59 which shown in Graph 1 with MSK conditions mainly with upper limb 64 (61.5%) & lower limb 40 (38.5 %) fractures (As shown in Graph 2); and working in a broad range of job voluntarily participated in this study. They were further categorised as per physical demands, of which Sedentary were 8 patients , Light 34 patients, Moderate 47patients, and Heavy 15patients, Very Heavy no patients were reported.(As shown in Graph 3

Table No. 1.

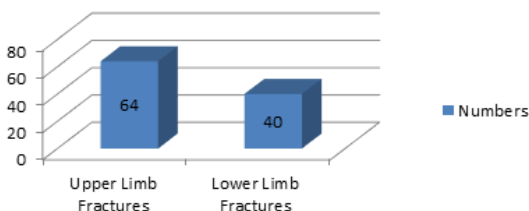
Gender Included (N= 104)	Numbers	Percentage (%)
Male Patients	72	69.2%
Female Patients	32	30.8%

Number of subjects in each age group



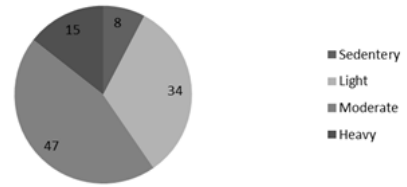
Graph 1

Fractures included in MSK Condition (N=104)



Graph 2

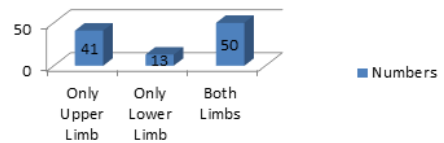
Number of subjects with respect to Type of work



Graph 3

The Graph 4 shows the comparison between the subjects as per limb preference with respect to profession. Among the groups, profession requiring both limb are more as compared to only lower limb.

Use of Limbs with respect to Profession (N= 104)



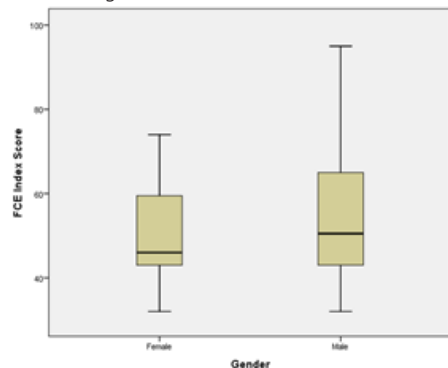
Graph 4

Table 2 depicts the distribution of subjects with respect to type of bone involved in fracture and their median OT FCE score. Statistically significant difference was not found among the various groups. However, the median scores were higher for lower limb fracture than upper limb.

Table No 2

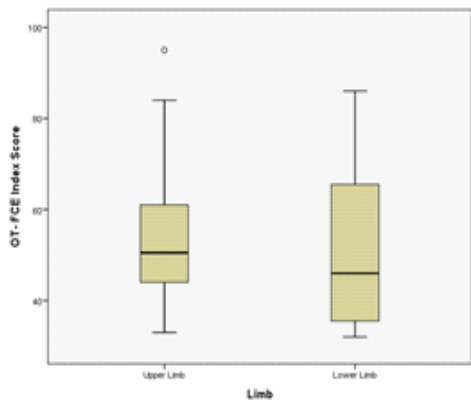
Bone involved in Fracture	N	Median	IQR	
Metacarpal	4	43.0	39.75 - 47.75	p = 0.43
Scaphoid	11	46.0	43.00 - 54.00	
Humerous	20	51.0	43.25 - 64.25	
Radius & Ulna	29	53.0	45.50 - 64.50	
Patella	9	57.0	37.00 - 68.50	
Femur	15	58.0	38.00 - 69.00	
Tibia	16	58.0	38.00 - 69.00	

Overall Median OT FCE index score was 49.0 (43.0-63.75). **Graph 5 compares the median OT FCE Index score between males and females.** There was no statistically significant difference found between the scores (p=0.49). However, the median OT FCE index score was higher in males than females.



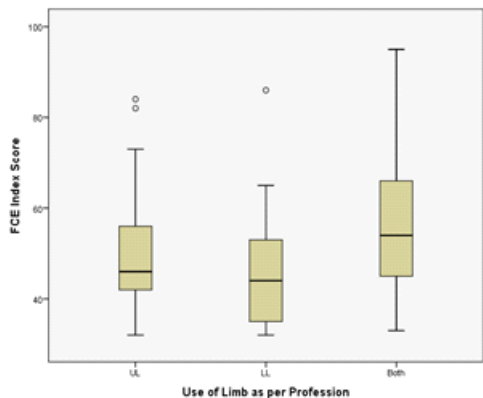
Graph 5

The number of subjects affected in lower limb was 40 (38.5 %) and in upper limb were 64 (61.5%). **Graph 6 compares the median OT FCE Index score between types of limb involved in the injury.** There was no statistically significant difference noted between the scores (p=0.24). However, the median OT FCE score was higher for upper limb than lower limb.



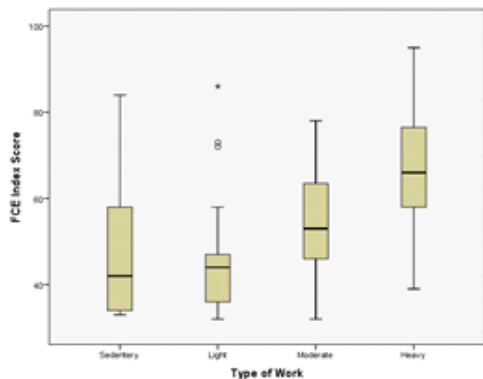
Graph 6

The frequency of subjects that used both the limbs was 50 (48.1%), only lower limb was 13 (12.5 %) and only upper limb was 41 (39.4 %). Graph 7 compares the median **OT FCE Index** score among type of limb used by different professionals. There was a statistically significant difference found among the scores ($p = 0.002$). The median **OT FCE Index** score was highest among the professions that utilize both the limb. However, the median OT FCE score was comparable between the professions that used upper limb and lower limb.



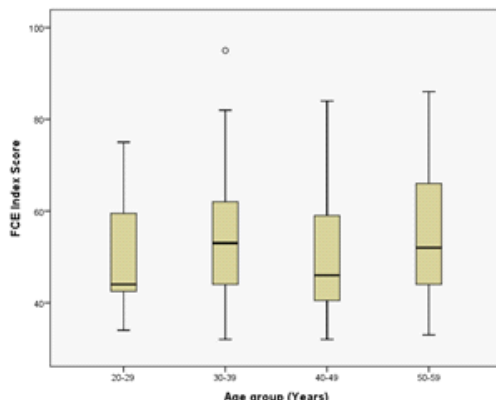
Graph 7

Graph 8 compares the median FCE score among various types of work. There was a statistically significant difference found among the scores ($p < 0.001$). The median **OT FCE Index** score was highest among the professions including heavy weights. And, the median score gradually reduced towards sedentary work load.



Graph 8

Graph 9 depicts the median **OT FCE Index** score among various age groups. The median **OT FCE Index** score was highest among the 30 to 39 age group and lowest among 20-29 age groups. However, a statistically significant difference among various age groups could not be established ($p = 0.43$).



Graph 9

DISCUSSION

FCEs were often criticized because of the lack of scientific evidence to support claims of reliability and validity. Job analyses performed by work place assessments are, however, for many practitioners inappropriate, because of the time consuming process and absence of sufficient support concerning validity and reliability. And due to lack of evidence may have prevented a more widespread use of FCEs in medical disciplines.

However, it appears that self-reports and expert-based assessments continue to be predominant means to assess functional capacity. While questionnaires can be used to assess self-reported ability to perform activities, the main asset of an FCE is that it assesses the ability to perform activities and physical demands. The question of whether an FCE is useful to complement an expert assessment cannot be answered until the psychometric properties of expert assessments are known and the strength of the relationships discovered.

So in our study initially we develop the tool require for Occupational Therapist to screen out the physical demands of patients with different musculoskeletal conditions. This were used to determine the specific information from the patient about their job and description of job in detail with respect to physical demand levels.

It is also facilitate to understand specific demands in less time and easy to administer in all settings. In our study the OT FCE Index play vital role administered the job specific FCE actual test in patients; as it consist of overall occupations job specific physical demands as per Indian context.

Our study results show the median OT FCE Index score was highest among the 30 to 39 age group and lowest among 20-29 age groups. However, a statistically significant difference among various age groups could not be established ($p = 0.43$); and median OT FCE index score was higher in males than females.

The median OT FCE Index score was highest among the professions including heavy weights. And, the median score gradually reduced towards sedentary work load. And the median scores were higher for lower limb fracture than upper limb fractures. Also median OT FCE score was higher for upper limb involvement than lower limb involvement. The median OT FCE Index score was highest among the professions that utilize both the limb. However, the median OT FCE score was comparable between the professions that used upper limb and lower limb.

As above mention in the study, has few limitation, as we require doing reliability on same diagnosis, even though we have selected the fractures cases, but we could develop the reliability on specific fractures. Also require to develop the reliability on specific group of professions and type of work. Our study recommended the future study to develop norms on specific job or type of work, so this tool can be more reliable to use in any context.

CONCLUSION

OT FCE Index seems to be a promising and reliable tool to assess the physical demands of patient with fractures with relation to their occupation. It may contribute significantly to a comprehensive guide for intervention in rehabilitation programs. This research contributes to closing the gap between workload and work capacity with normal individuals as well as physical disabled. We suggest that this research will be guides to support clinical decision-making and may it will useful for recommendation for return to work for MSK injured individuals.

ACKNOWLEDGEMENT

First and foremost I thank God almighty for his constant presence and blessings. It's my pleasure and privilege to record my sincere thanks to **Dr. Predeep Naik**, Dean, Goa Medical College, Bombolim, Goa; to my Supervisor **Dr. Amitabh Dwivedi**, PhD (Occupational Therapy), Dean and Professor, Jaipur Occupational Therapy College, Maharaj Vinayak Global University, Jaipur, Rajasthan; I would also like to express my gratitude to all the patients for their utmost co-operation

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