

## USING THE INTERNATIONAL CLASSIFICATION OF FUNCTIONING, DISABILITY AND HEALTH FRAMEWORK TO DOCUMENT LEVELS OF FUNCTION AND DISABILITY IN EMPLOYEES WITH MUSCULOSKELETAL DISORDERS

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Article Received date: 08 May 2024

Article Revised date: 28 May 2024

Article Accepted date: 18 June 2024



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### ABSTRACT

**Background:** The purpose of this project was to explore the application of the International Classification of Functioning, Disability and Health (ICF) in an occupational health setting by determining whether it was able to adequately capture the levels of functioning and disability of employees with musculoskeletal disorders. **Methods:** The Cohort database was utilised to identify and select employees with musculoskeletal disorders that attended the occupational health service within the data collection period. Employees were mailed the ICF-checklist and asked to complete and return it in a pre-paid envelope. **Results:** The most common impairments of body functions and body structures were consistent with the literature. Manual handling was reported as the most common activity limitation and participation restriction. The facilitator employees felt supported them at work was the provision of health professionals and employment services and policies. The main barrier employees reported at work was dealing with people in position of authority. **Conclusion:** The ICF was found to be a useful tool for providing a framework within which to explore functioning and disability of employees with musculoskeletal disorders. However, the findings should be validated in a larger sample.

**KEYWORDS:** ICF Checklist, Occupational Health, Employees, Function, Disability, Musculoskeletal Disorders.

### INTRODUCTION

Musculoskeletal disorders remain one of the most serious and common health conditions in the workplace today, often leading to time off work.<sup>[1]</sup> The number of employees with musculoskeletal disorders has increased significantly over the past decade with back pain being the most frequently reported complaint.<sup>[2]</sup> The main predisposing workplace factors include heavy manual handling, repetitive strain, working in awkward positions, lack of safety equipment and poor organisational support.<sup>[3]</sup> Musculoskeletal disorders can occur suddenly and is unpredictable in terms of affected function and disability. Living with a musculoskeletal disorder can impact multiple domains such as functional, cognitive, economic and social lives of employees, sometimes leading to permanent changes in lifestyle and work roles.<sup>[4]</sup> In 2001, the World Health Organisation (WHO) published the International Classification of Functioning, Disability and Health (ICF), a sister classification to the universally used International Classification of Diseases (ICD), which has since become the standard classification of functioning and disability.<sup>[5]</sup> The ICF is a framework for describing

functioning and disability in relation to a health condition through classification of functional impairments, activity limitations and participation restriction, and environmental factors and is regarded as the most comprehensive model available for describing and understanding functioning and disabilities.<sup>[6]</sup> As such, it is a very important framework with which to improve and refine the documentation of functioning and disability in relation to a health condition. However, the use of the ICF amongst health professionals within an occupational health setting is limited. Consequently, a dearth of literature is available on its application within this setting. The purpose of this project was to explore the application of the ICF in an occupational health setting by determining whether it was able to adequately capture the levels of functioning and disability of employees with musculoskeletal disorders at a North London National Health Service Foundation Trust in the United Kingdom.

### METHODS

Data were collected from June 1 to December 31, 2023, at an occupational health service based within a North

London National Health Service Foundation Trust in the United Kingdom. This Trust is one of the main healthcare providers within the North London borough of England. It employs approximately 11,000 staff members who are eligible to access the occupational health services for work-related or work-impacting health conditions. A Cohort database was utilised to identify and select employees with musculoskeletal disorders that attended the occupational health service within the data collection period. Musculoskeletal disorders were chosen as the health condition because of the impact of the disorder on sickness absence and it was anticipated that several codes would be required to describe the functioning and disabilities of affected employees. Employees were mailed the ICF-checklist and asked to complete and return it in a pre-paid envelope. Demographic data such as age, gender, years of service, work status and site of pain/injury was captured on a spreadsheet. The ICF-checklist is an instrument used to capture the ICF codes and record information on the functioning and disability of the employee using qualifiers. Qualifiers are sub-codes used to record the extent of functioning or disability within a domain, and the extent to which an environmental factor is a facilitator or barrier. The author attended a two-day training workshop on the use of the ICF prior to commencement of the project. The English version of the ICF-checklist was utilised. The ICF-checklist comprises three classification sections, firstly, impairments of body functions (which are the physiological functions of body systems, including psychological functions), and impairments of body structures (which are problems in body function as a significant deviation or loss);

secondly, activity limitations (which are difficulties an individual may have in executing activities), and participation restriction (which are problems an individual may have in involvement in life situations; and thirdly, environmental factors (which make up the physical, social and attitudinal environment in which people live and conduct their lives). Each section consists of the following codes: b-codes for impairments of body functions and s-codes for impairments of body structures; d-codes for activity limitations and participation restriction; and e-codes for environmental factors. Data analysis was performed using the Statistical Software for Excel package. This project was classified as a service improvement initiative and therefore ethical approval was not required.<sup>[7]</sup>

## RESULTS

A total of 173 ICF-checklists were posted during the data collection period. Overall, 108 (62.4%) employees completed and returned the ICF-checklists and were included in the analysis. Domains within the ICF-checklist in which no problems were reported are not included. The demographics characteristics of employees are shown in Table 1. The mean age of the employees was 54.9 years, and the mean years of employment were 12.6 years. More females (73.1%) presented with musculoskeletal disorders than males (26.9%). The most common site of pain/injury was reported as spinal (47.2%), followed by lower limb (29.7%), and the least reported site was the upper limb (23.1%). Of those attending the occupational health service for musculoskeletal disorders, more were at work (56.5%) compared to being off work due to pain/injury (43.5%).

**Table 1: Demographic Characteristics.**

| Variables           | n    | %    |
|---------------------|------|------|
| All employees       | 108  | 100  |
| Years in service    | 12.6 |      |
| Gender              |      |      |
| Female              | 79   | 73.1 |
| Male                | 29   | 26.9 |
| Work status         |      |      |
| At work             | 61   | 56.5 |
| Not at work         | 47   | 43.5 |
| Site of pain/injury |      |      |
| Spinal              | 51   | 47.2 |
| Upper limb          | 25   | 23.1 |
| Lower limb          | 32   | 29.7 |

**Table 2: Impairments of Body Functions.**

| Domain           | Code | Category                         | Responses  |
|------------------|------|----------------------------------|------------|
| Mental functions | b130 | Energy and drive functions       | 71 (65.7%) |
|                  | b134 | Sleep                            | 45 (41.7%) |
|                  | b140 | Attention                        | 39 (36.1%) |
|                  | b144 | Memory                           | 17 (15.7%) |
|                  | b152 | Emotional functions              | 56 (51.9%) |
|                  | b164 | Higher level cognitive functions | 3 (2.8%)   |

|   |      |                    |            |
|---|------|--------------------|------------|
| Sensory functions and pain                                  | b235 | Vestibular         | 34 (31.5%) |
|   | b280 | Pain               | 98 (90.7%) |
| Voice and speech functions                                  | b420 | Blood pressure     | 26 (24.1%) |
|   | b440 | Respiration        | 9 (8.3%)   |
| Functions of the digestive, metabolic and endocrine systems | b515 | Digestive          | 12 (11.1%) |
|   | b530 | Weight maintenance | 23 (21.3%) |
| Neuromusculoskeletal and movement related functions         | b710 | Mobility of joint  | 85 (78.7%) |
|   | b730 | Muscle power       | 68 (63.0%) |
|   | b735 | Muscle tone        | 43 (39.8%) |

**Table 3: Impairments of Body Structures.**

| Domain   | Code | Category                          | Responses  |
|--|------|-----------------------------------|------------|
| Structure of the nervous system  | s120 | Spinal cord and peripheral nerves | 32 (29.6%) |
| Structure of the cardiovascular, immunological and respiratory systems | s410 | Cardiovascular system             | 9 (8.3%)   |
|  | s430 | Respiratory system                | 6 (5.6%)   |
| Structure related to movement  | s710 | Head and neck region              | 19 (17.6%) |
|  | s730 | Upper extremity                   | 25 (23.1%) |
|  | s750 | Lower extremity                   | 32 (29.7%) |

**Table 4: Activity Limitations and Participation Restriction.**

| Domain                                       | Code | Category                      | Responses  |
|--|------|-------------------------------|------------|
| General tasks and demands                    | d210 | Undertaking a single task     | 12 (11.1%) |
|  | d220 | Undertaking multiple tasks    | 19 (17.6%) |
| Mobility                                     | d430 | Lifting and carrying objects  | 49 (45.4%) |
|  | d440 | Fine hand use                 | 25 (23.1%) |
|  | d450 | Walking                       | 24 (22.2%) |
|  | d465 | Moving around using equipment | 17 (15.7%) |
|  | d470 | Using transportation          | 4 (3.7%)   |
|  | d475 | Driving                       | 3 (2.8%)   |
| Interpersonal interactions and relationships | d740 | Formal relationships          | 21 (19.4%) |
|  | d760 | Family relationships          | 15 (13.9%) |
| Major life areas                             | d850 | Remunerative employment       | 42 (38.9%) |
|  | d870 | Economic self-sufficiency     | 39 (36.1%) |
| Community, social and civic life             | d920 | Recreation and leisure        | 3 (2.8%)   |

**Table 5: Environmental Factors.**

| Domain                         | Code | Category   | Facilitator | No Barrier/<br>Facilitator | Barrier    |
|--------------------------------|------|--|-------------|----------------------------|------------|
| Support and relationships      | e310 | Immediate family   | 9 (8.3%)    | 2 (1.9%)                   | 4 (3.7%)   |
|                                | e320 | Friends  | 10 (9.3%)   | 3 (2.8%)                   | 2 (1.9%)   |
|                                | e325 | Acquaintances, peers, colleagues, neighbours and community members | 12 (11.1%)  | 4 (3.7%)                   | 3 (2.8%)   |
|                                | e330 | People in position of authority                                    | 3 (2.8%)    | 1 (1.9%)                   | 28 (25.9%) |
|                                | e355 | Health professionals   | 32 (29.7%)  | 1 (1.9%)                   | 5 (4.6%)   |
| Services, systems and policies | e580 | Health services, systems and policies                              | 22 (20.4%)  | 0 (0.0%)                   | 8 (7.4%)   |
|                                | e590 | Labour and employment services, systems and policies               | 28 (25.9%)  | 0 (0.0%)                   | 7 (6.5%)   |

The impairments of body functions are shown in Table 2. The most common impairments of body functions reported were pain (b280, 90.7%), mobility of joint (b710, 78.7%), energy and drive functions (b130, 65.7%), muscle power (b730, 63%) and the least common impairments of body functions reported were higher level cognitive functions (b164, 2.8%), respiration (b440, 8.3%), digestion (b515, 11.1%) and memory (b144, 15.7%). The impairments of body structures are shown in Table 3. The most common impairments of body structures reported were lower extremity (s750, 29.7%), spinal cord and peripheral nerves (s120, 29.6%), upper extremity (s730, 23.1%), head and neck region (s710, 17.6%) and the least common impairments of body structures reported were cardiovascular system (s410, 8.3%) and respiratory system (s430, 5.6%). The activity limitations and participation restriction are shown in Table 4. The most common impairments due to activity limitations and participation reported were lifting and carrying objects (d430, 45.4%), remunerative employment (d850, 38.9%), economic self-sufficiency (d870, 36.1%) and the least common impairments due to activity limitations and participation reported were driving (d475, 2.8%), recreation and leisure (d920, 2.8%) and using transportation (d470, 3.7%). The environmental factors are shown in Table 5. The most common facilitators due to environmental factors reported were health professionals (e355, 29.7%), labour and employment services, systems and policies (e590, 25.9%), health services, systems and policies (e580, 20.4%) and the most common barrier due to environmental factors reported was people in position of authority (e330, 25.9%).

## DISCUSSION

The focus of this project was to adequately capture the levels of functioning and disability of employees with musculoskeletal disorders. The success of treatment and rehabilitation measures is possible with a successful classification of the existing impairments that need to be addressed by these measures. The ICF provides a common language and framework for describing a person's level of functioning and disability in their unique circumstances and is therefore a useful framework for describing the impairments of employees with musculoskeletal disorders. Most functional limitations reported were generally consistent with the literature, such as symptoms of pain, loss of mobility and muscle power and the loss of energy and drive functions, however, it was surprising that some of the least functional impairments reported were higher level cognitive functions and memory. The literature has identified several studies that report problems in the areas of depression and low mood associated with musculoskeletal disorders which impact on cognitive functioning and memory.<sup>[8,10]</sup> This finding was therefore different from initial expectations and would not have been identified without the use of a comprehensive checklist. The implication for treatment is that the focus should be more on physical rehabilitation and less on

psychologically informed models of rehabilitation. As expected, most of the impairments of body structures were of the musculoskeletal system. Consistent with the literature, the activity limitations and participation restriction demonstrate that most musculoskeletal disorders were due to manual handling.<sup>[11]</sup> In addition, many found that remaining in employment and being able to maintain themselves economically became challenging due to their musculoskeletal disorder. The literature reports musculoskeletal disorders as one of the most common reason employees take time off work and this in turn impacts financially on the employee when their sickness absence benefits are reduced or terminated.<sup>[12,13]</sup> The facilitator employees felt supported them at work was the provision of health professionals and employment services and policies. Physical therapists have been identified as the health professional group mostly likely to impact the health and wellbeing of employees with musculoskeletal disorders.<sup>[14,15]</sup> The main barrier employees reported at work was dealing with people in position of authority. Those in a position of authority at work, such as the line manager and/or human resource manager, play an important role when supporting employees with musculoskeletal disorders remain or return to work. A lack of support from those in positions of authority can hinder the remain or return to work process and often leads to the employee leaving their employment and/or taking a formal grievance against senior management.<sup>[16]</sup> The strength of this project is that it is the first to explore the application of the ICF in an occupational health setting and it provided a fairly accurate description of the levels of functioning and disability of employees with musculoskeletal disorders. A limitation of this project is that the sample was limited by the time-consuming nature of the checklist, which discouraged some employees from completing it.

## CONCLUSION

In conclusion, the ICF was found to be a useful tool for providing a framework within which to explore functioning and disability of employees with musculoskeletal disorders. The ICF provided a scientific basis for understanding the functioning and disability of employees with musculoskeletal disorders at a healthcare Trust in North London, United Kingdom. The conceptualisation of the different domains provided a structure within which to gather and interpret information. Clinicians using the ICF are encouraged to undergo training in its use to prevent confusion and misinterpretation of the several domains and categories. The data gathered can be used to improve and inform service delivery, evaluation, research and/or audit. It can also be used to understand the needs of a particular group, area or practice within occupational health. Although this framework can be used as a basis for discussion around functioning and disability, the findings should be validated in a larger sample.

## REFERENCES

1. Tang, K. H. D. The prevalence, causes and prevention of occupational musculoskeletal disorders. *Global Academic Journal of Medical Sciences*, 2022; 4(2): 56-68.
2. Sundstrup, E., Seeberg, K. G. V., Bengtsen, E., & Andersen, L. L. A systematic review of workplace interventions to rehabilitate musculoskeletal disorders among employees with physical demanding work. *Journal of Occupational Rehabilitation*, 2020; 30(4): 588-612.
3. Chetty, L. Musculoskeletal injury patterns at an occupational health physiotherapy clinic in the United Kingdom. *The Internet Journal of Rheumatology*, 2009; 6(2): 1-6.
4. Mullen, N., Ashby, S., Haskins, R., & Osmotherly, P. The perceptions of individuals with musculoskeletal disorders towards prognosis: An exploratory qualitative study. *Musculoskeletal Care*, 2023; 21(2): 527-536.
5. Atkinson, H. L., & Nixon-Cave, K. A tool for clinical reasoning and reflection using the International Classification of Functioning, Disability and Health (ICF) framework and patient management model. *Physical Therapy*, 2011; 91(3): 416-430.
6. Jette, A. M. Toward a common language for function, disability, and health. *Physical Therapy*, 2006; 86(5): 726-734.
7. Health Research Authority. *Defining Research Table*, 2017. [http://www.hra-decisiontools.org.uk/research/docs/DefiningResearchTable\\_Oct2017-1.pdf](http://www.hra-decisiontools.org.uk/research/docs/DefiningResearchTable_Oct2017-1.pdf)
8. Chimenti, M. S., Fonti, G. L., Conigliaro, P., Triggianese, P., Bianciardi, E., Coviello, M., Lombardozzi, G., Tarantino, G., Niolu, C., Siracusano, A., & Perricone, R. The burden of depressive disorders in musculoskeletal diseases: Is there an association between mood and inflammation? *Annals of General Psychiatry*, 2021; 20(1): 1-13.
9. Crofford, L. J. Psychological aspects of chronic musculoskeletal pain. *Best Practice & Research Clinical Rheumatology*, 2015; 29(1): 147-155.
10. Tsatali, M., Papaliagkas, V., Damigos, D., Mavreas, V., Gouva, M., & Tsolaki, M. Depression and anxiety levels increase chronic musculoskeletal pain in patients with Alzheimer's disease. *Current Alzheimer Research*, 2014; 11(6): 574-579.
11. Chetty, L. Effectiveness of physiotherapy provision within an occupational health setting. *Indian Journal of Physiotherapy and Occupational Therapy*, 2011; 53(3): 50-53.
12. Chetty, L. Health-related quality of life and cost-utility analysis of employees with musculoskeletal disorders receiving vocational physiotherapy. *Workplace Health & Safety*, 2020; 68(10): 476-479.
13. Phillips, C. J., Phillips, R., Main, C. J., Watson, P. J., Davies, S., Farr, A., Harper, C., Noble, G., Aylward, M., Packman, J., Downton, M., & Hale, J. The cost effectiveness of NHS physiotherapy support for occupational health services. *BMC Musculoskeletal Disorders*, 2012; 13: 29-39.
14. Chetty, L. The role of physiotherapy in occupational health rehabilitation: A review of the literature. *Indian Journal of Physiotherapy and Occupational Therapy*, 2013; 7(4): 118-112.
15. Prall, J., & Ross, M. The management of work-related musculoskeletal injuries in an occupational health setting: the role of the physical therapist. *Journal of Exercise Rehabilitation*, 2019; 15(2): 193-199.
16. Branch, S., Ramsay, S., & Barker, M. Workplace bullying, mobbing and general harassment: A review. *International Journal of Management Reviews*, 2013; 15(3): 280-299.