Return to work with chronic low back pain: Using an evidence-based approach along with the occupational therapy framework

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Abstract. This paper will attempt to apply the occupational therapy framework [1] along with an evidence-based approach and an occupation-based intervention with a population of workers with chronic low back pain (CLBP) to help them return to work and maintain their work status. This paper will focus primarily on those clients with CLBP who still have a link to their employment but who do not perceive themselves as being capable to go back to their job despite conflicting opinions from other stakeholders (primary health care professionals, employer or insurer). They are being evaluated in occupational therapy shortly before return to work and followed until their optimal functional capacities are reached. This means that either all functional goals related to the actual physical demands of their job have been reached or that further treatment does not result in functional improvement.

Keywords: Chronic low back pain, musculoskeletal, return to work, evidence-based, occupation-based, occupational therapy framework

1. Introduction

1.1. Clientele

Chronic low back pain (CLBP) is traditionally defined as low back pain with no known etiology and of over 12 weeks duration [20]. Health related care and work loss for people with chronic low back pain account for 75–90% of the socio-economic cost of all low back pain cases.

Because of its high prevalence and cost, a considerable amount of research has been done since the mid 80s in order to establish the predictors of work disability in this population [9]. Just recently, Kuijer et al. [20] systematically reviewed randomized controlled trials (RCTs) and prognostic studies in an attempt to summarize this large body of evidence. Despite more than 100 identified predictors of disability [9], most studied either once or twice, and the hardship of reconciling different study designs and outcome measures, Kuijer, Groothoff et al. found that only the person’s own expectations of recovery constituted consistent evidence as a predictor of the final decision to return to work. This finding is echoed in many other research and review articles not included in the systematic review [6, 10,17,28]. Limited evidence for duration of work disability was found for a few factors including health transition score and own expectations associated with employer’s response [20]. A large body of conflicting evidence was also found, notably in terms of the work organization structure and physical demands. However, research studying these latter determinants are qualitative in nature [22] and have not been included in such a systematic review of the quantitative literature.

Return-to-work is often considered the ultimate level of functional status as well as the end of economic loss for all stakeholders involved. It is also commonly equated with recovery [11,26]. However, Baldwin et al. (1996; as cited in Ferguson et al. [11]) established that around 60% of workers discharged from medi-
cal/therapeutic care when returning to work experienced further work disability. Not only the human cost of suffering and loss is great, but the financial burden of a re-injury is usually larger than the initial injury [11]. Baldwin et al. (as cited Dionne et al. [7]) suggested that return to work should be stratified to include functional levels ranging from returning to work with no or very little functional limitations and doing the former or a similarly demanding job, to return to only part of the former job duties with functional limitations. Ferguson et al. support this view in proposing that return to work should not be equated with recovery: clients who return to work after an injury to their back may have to receive medical and/or rehabilitative treatment even after full return to work has occurred. Injured workers can be at work but unable to fully perform their functions. This is referred to as “presenteeism” [14]. Because physical recovery is embedded in complicated ways in the workplace processes, practices and social organization, return-to-work extends beyond managing physical function to the beliefs, roles, and perceptions of many players including the worker, the insurer and the employer [3,22].

Occupational therapists are health professionals who use meaningful activities as a means and as an end to treatment. Their role is to assist people to return to meaningful occupations in order to promote health. Baril et al. [4] found that becoming totally disabled after a compensated musculoskeletal disorder had a negative effect on a person’s quality of life including his financial, mental and physical health. Despite this finding, it may be difficult to address a therapeutic return-to-work goal in a client-centered practice framework when the client’s targeted goals do not include return to work. It may also be difficult to devise a successful return to work when the match of the available job demands with the client’s capacities is questionable: in this case, it causes discrepancy with our goals of facilitating health. How can we ensure that the participation of this kind of client in work occupations contribute to their health and wellbeing?

This paper will attempt to apply the occupational therapy framework [1] along with an evidence-based approach and an occupation-based intervention with a population of workers with CLBP to help them return to work and maintain their work status. This work will focus primarily on those clients with CLBP who still have a link to their employment but who do not perceive themselves as being capable to go back to their job despite conflicting opinions from other stakeholders (primary health care professionals, employer or insurer). They are being evaluated in occupational therapy shortly before return to work and followed until their optimal functional capacities are reached (i.e. a performance plateau is attained in the job capacities targeted by therapy or no further improvement in functional capacities despite therapy).

2. Occupational profile

2.1. Who is the client?

CLBP is defined as low back pain with no known etiology and of over 12 weeks duration. Because of the pathology, associated pain, kinematic changes (i.e. change in the way muscles are recruited in the back), psychosocial factors (e.g. fear of reinjury) and other symptoms and signs associated with the CLBP, the clients targeted by this paper have difficulty completing their work tasks, or return-to-work is pending an intervention in occupational therapy. Clients usually present difficulties doing other non work-related tasks, of have completely relinquished them to keep their residual capacities available for their working time window.

2.2. Why is the client seeking services?

More often than not, clients are receiving occupational therapy services because their insurance carrier, employer or primary care health professional have asked them to. They may be totally off work or are back to work in a modified duty job. As a rule, in this paper, the goal of the intervention is suggested by the referring agent as helping clients to get back to work in their former tasks, as quickly as possible.

2.3. What occupations and activities are successful or are causing problems?

With this clientele, activities involving awkward postures (such as bending, twisting), standing or sitting for prolonged periods, whole-body vibration, manually handling materials (such as lifting or lowering weights), forceful movements (such as pushing, pulling, working with hands at or above shoulder level or without support, maneuver pedals with lower extremity, standing on an unstable platform) are known to trigger or aggravate a pre-existing back disorder [8,21,30]. Depending on the individual’s pathology and on their particular signs and symptoms some tasks are more difficult than others. For instance, one person might find it
difficult to stay seated for more than 20 minutes while another person can not walk for more than a few feet at a time. These functional components further impede the person’s participation in different occupations or activities, such as sitting to watch a movie, to work at their desk or to walk fast with sudden stop-and-go as part of their work on a busy nursing unit. Depending on the types of occupations in which these people used to engage before their injury, and the signs and symptoms they are currently presenting, their back injury will impact them differently.

2.4. What contexts support or inhibit desired outcomes?

Research tells us that a person’s own expectations regarding their eventual return to work or recovery is the single most powerful predictor factor for actual return to work [6,10,12,17,20,28]. But what does influence this perception? One hypothesis is that other factors, recognized in the literature as possible predictors of work absence, (such as high job demands, unavailability of light duty, high pain intensity and long duration of work absence) [9], may be impacting this perception. Schultz et al. suggest that the worker’s motivation to return to work depends on the relative value placed on work versus the cost associated with dealing with the pain inherent to returning to a more active lifestyle. They also conclude that the causes for work absence are “far more complex, multifactorial and individualized than reasons for return to work” [28, p. 83]. Fisher [12] notes: “therapists report that achieving changes in both work and non-work roles facilitates clients beginning to see themselves as employable for the first time since their injury” (p. 29). Qualitative research has given us some empirical indicators of return to work delay. These indicators include the worker’s perception of insufficient care or incomplete medical investigation, of receiving the wrong treatment, of having a major injury, of judging the work equipment as unsuitable or of perceiving the work demands as not matching their capacities [9].

A recent systematic review of randomized controlled trials (RCTs) by Schonstein et al. [27] identified that using physical conditioning, performing some kind of ergonomic interventions 1 at the workplace and adding a cognitive-behavioral approach 2 to a non-clinic based treatment were the most effective approaches to help injured workers return to work. This suggests that besides the client’s expectations regarding their eventual return to work, their fitness level, work structure and organization, as well as belief system, may be targets for therapy goals in order to facilitate return to work.

An even more recent systematic review of the quantitative literature about return to work (RTW) interventions established that there was “strong evidence that work disability duration is significantly reduced by work accommodation offers and contact between healthcare provider and workplace; and moderate evidence that it is reduced by interventions which include early contact with worker by workplace, ergonomic work site visits, and presence of a RTW coordinator” [13, p. 607].

2.5. What are the client’s occupational history, priorities and targeted outcomes?

Particular occupational histories, priorities and targeted outcomes depend on the individual clients. Although most clients referred to occupational therapy have physically demanding jobs, they range from being blue collar workers to CEO’s of companies, from being single with no children to being the parent of preschoolers. Their priorities and targeted outcomes depend on their work and personal histories, their values as well as their needs.

3. Occupational profile analysis

As mentioned before, three systematic reviews of the literature [13,20,27] come to the same conclusion as to what are the predictors of prolonged absence from work from an evidence-based point of view. In the following table, on the left column, these predictors are worded similarly to how they appear in the systematic reviews. On the right column, these concepts are entangled with the occupational therapy framework vocabulary in order to establish the basis of the intervention. The occupational therapy framework is a mental model accepted by the AOTA in 2002 as a basis for interventions in occupational therapy. It suggests a “top-down” approach in which clients’s occupational profiles (their participation in their meaningful activities) is the target of the intervention. In order to diagnose properly what are the causes of a sub-optimal life participation, the framework categorizes the possible causal factors in factors and sub-domains.

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1 Undefined as to the content, quantity and goals.
2 Idem.
### Table 1

<table>
<thead>
<tr>
<th>Determinants/Predictors</th>
<th>Domains and sub-domains of the OT framework</th>
</tr>
</thead>
<tbody>
<tr>
<td>– Client’s expectations of returning to work</td>
<td><strong>Client factors</strong> (body functions: temperament and personality functions, energy and drive functions, experience of self and time functions, sensory functions and pain). The client’s role has changed from being a worker to a non-worker. This is an area of performance patterns.</td>
</tr>
<tr>
<td>– Particular belief system</td>
<td>Performance skills (motor skills: posture, mobility, coordination, strength, effort and energy). The impaired fitness may be partly a consequence of impaired performance patterns, since the routine of a working adult usually involves getting up and moving around during the day, especially for people with more physically demanding work.</td>
</tr>
<tr>
<td>– Fitness level</td>
<td><strong>Context</strong></td>
</tr>
<tr>
<td></td>
<td>– cultural: pain and disability as regarded in the client’s culture; work absence as regarded by the client’s family and work culture</td>
</tr>
<tr>
<td></td>
<td>– social: type of insurance, support system both at and off work, legal council present or not</td>
</tr>
<tr>
<td></td>
<td>– spiritual: beliefs about work ethics and value</td>
</tr>
<tr>
<td></td>
<td>– temporal: age and gender at the time of injury, work stability, duration of disability, time before retirement</td>
</tr>
<tr>
<td>– Work organization and structure</td>
<td><strong>Activity demands</strong></td>
</tr>
<tr>
<td></td>
<td>– space and objects characteristics: includes availability and pertinence of accommodations at the worksite.</td>
</tr>
<tr>
<td></td>
<td>– sequencing and timing of activities at work and outside, including availability of accommodations for time (schedule or pace) and sequence.</td>
</tr>
<tr>
<td></td>
<td>– social demands: quality of relationship at and off work, type of work (e.g. customer or machine oriented)</td>
</tr>
<tr>
<td></td>
<td>– required body functions and structures</td>
</tr>
<tr>
<td>– Client factors</td>
<td><strong>Client factors</strong> (body functions and structures) (temperament and personality functions, energy and drive functions, experience of self and time functions, sensory functions and pain)</td>
</tr>
<tr>
<td>– Required actions at work and off work</td>
<td><strong>Performance skills</strong> (motor and communication skills<em>3</em>)</td>
</tr>
<tr>
<td>– Performance patterns (roles, routines and habits)</td>
<td><strong>Performance patterns</strong> (roles, routines and habits)</td>
</tr>
</tbody>
</table>

All of these predictors are known to affect the client’s participation in at least one sub-domain of the areas of occupation (that is, work) but is most likely to affect at least one other sub-domain, such as social participation, leisure or ADL’s. A major focus of the occupational therapist will be to identify which sub-domains are significant to the individual and set the therapeutic goals upon them (Table 1).

### 4. Evaluation

The first step in establishing a plan of treatment to facilitate people’s participation in their life activities is to evaluate the extent and reasons of their participation withdrawal. Considering the importance of the work-

*3To complicate matters further, some people with chronic low back pain (CLBP) develop a “communal coping style”, displayed in overly strong expressions of pain, including vocalizations and grimacing. This coping style, although adaptive in the acute phase of pain, becomes maladaptive when the condition becomes chronic [29].
of returning to work despite conflicting opinions from other stakeholders. Therefore, since a job is readily available, a job analysis of the demands will provide part of the goals of the rehabilitation program.

As it is for predictive validity of FCE results used alone to determine return-to-work readiness, research on FCEs results responsiveness to the client’s actual change in condition is complicated by the choice of appropriate external criterion and the natural change in performance over the course of time [19], the results of repeated FCEs should be used to monitor and compare them to the workers’ perception of their actual change in functional status over the course of the return-to-work program. Knowing that there is weak correlation between worker’s self-report and FCE results [6] the results should not be considered an objective evidence of discrepancy between “real” capacities and the workers’ perceptions of their capacity, but as a mean to establish achievable fitness goals.

Because participation in meaningful activities is not restricted to work, occupational therapy intervention usually also researches the effect of the back injury in other areas of performance, particularly in activities of daily living, using the Oswestry Disability Index (ODI). This tool assesses pain intensity and disability caused by low back pain in nine different activities of daily living. Pain intensity can and should be measured as a separate measure with a Pain Numerical Rating Scale.

Since so much of an occupational profile dysfunction rests within the person’s context, the importance of assessing the work organization and structure in which the client has or will be getting back to work cannot be overstated. Part of the Worker Role Interview can be used to assess the client’s perception of the “welcoming structure” of the organization. Although this concept has not been defined as such in the literature, there appears to be researchers’ consensus that one of the strongest predictor of return-to-work is the employer’s interest, values and input to facilitate the return-to-work process. Using a quantitative/qualitative method for assessing the work physical demand highlights one of the employer’s welcoming structure’s components. Using the Tools for modified work (TMW) has the advantage of not only pertaining to the external physical demands but to how much these demands are perceived by the worker. Since the TMW requires the presence of both an employer’s representative and the worker to be completed, it serves as a stepping stone for a semi-structured interview to address issues with the employers, such as possibilities for accommodations (modified and graduated work), flexibility in the work, production quotas, employer-employee relationship history and the like.

Finally, the use of the Work Role Functioning questionnaire (WRF) to establish a baseline to determine where the workers is independent to perform their complete job duties at the end of the rehabilitation program.

Table 2 highlights the construct to be evaluated, the tools mentioned in the above-paragraph for evaluating these constructs along with their references and psychometric characteristics.

The constructs and the tools suggested in this paper were selected after reading numerous studies and selecting the following papers. They are presented in Table 3 according to the evidence-based practice hierarchy proposed by Sackett et al.

5. Intervention

The evaluation part of an occupational treatment allows one to establish intervention goals and start intervening with the clients. Intervention follows the particular findings of the client’s evaluation. Context is crucial in occupational therapy and increases the efficacy of intervention [24]. This is echoed by the evidence that return-to-work programs based at the worksite are more effective than those clinic-based [27]. Therefore, based on the current research, best practice interventions should take place at the worksite whenever possible. Intervention that consists in developing a graduated return-to-work program using regular and modified duties in order to reach the optimal goal of returning clients to work full-time in their regular duties, with limited functional limitations, both at work and at home. The results of the evaluation should be compared to create an individualized graded treatment plan for clients with CLBP, using their work tasks and their occupational choices at home as therapeutic modalities.

5.1. Therapeutic approaches

In the medical model, therapeutic intervention is applied to the clients themselves. In the occupational therapy framework, this direct application of therapy would address either the client factors or their performance skills. While it is not common in medicine, therapeutic goals addressing the clients’ context, performance patterns and activity demands, which are not client factors under the occupational therapy framework, are prominent in rehabilitation and especially in occupational therapy.
### Table 2

Tools: reliability and validity

<table>
<thead>
<tr>
<th>Evaluated construct</th>
<th>Tool</th>
<th>Reliability</th>
<th>Validity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Client’s expectations of returning to work, values,</td>
<td>The Worker Role Interview (WRI)</td>
<td>WRI: high test-retest reliability: 0.86 to 0.94 with a total value of 0.95 and interrater reliability for six content areas ranged from 0.46 to 0.92 with a total value of 0.81 [5]</td>
<td>Azhar (master’s thesis, unavailable) studied the WRI along with demograhic data and found some predictive value in the tool, more so than with the demographic data. It has not been compared to other predictors, however.</td>
</tr>
<tr>
<td>roles, habits and social and physical environment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pain intensity</td>
<td>Pain numerical rating scale (PNRS)</td>
<td>PNRS: Excellent test-retest reliability $r = 0.96$ and good construct validity as compared with other measures of pain intensity [9]</td>
<td>No data</td>
</tr>
<tr>
<td>Fitness level (work and functional capacities)</td>
<td>Short form FCE</td>
<td>Short form FCE: no data</td>
<td>Predictive validity</td>
</tr>
<tr>
<td></td>
<td>– (FL) floor to waist lift</td>
<td></td>
<td>Hazard rate ratios</td>
</tr>
<tr>
<td></td>
<td>– (CR) crouching</td>
<td></td>
<td>– FL: 0.64 (CI: 0.42–0.97)</td>
</tr>
<tr>
<td></td>
<td>– (ST) standing</td>
<td></td>
<td>– CR: 0.59 (0.38–0.91)</td>
</tr>
<tr>
<td></td>
<td>Oswestry Disability Questionnaire (see below)</td>
<td></td>
<td>– ST: 0.68 (0.48–0.95)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>[15] (as a predictor of duration of absence)</td>
</tr>
<tr>
<td></td>
<td>Oswestry Disability Questionnaire (ODQ)</td>
<td>good test retest reliability ($r = 0.83$) and internal consistency (Cronbach’s $\alpha = 0.71$) [9]</td>
<td>No data</td>
</tr>
<tr>
<td>Work organization</td>
<td>WRI (see above) Tools for modified work (TMW)</td>
<td>TMW: No study</td>
<td>TMW: No study, high face validity (Agence de développement, 2005)</td>
</tr>
<tr>
<td>Work performance</td>
<td>Work Role Functioning (WRF) (previously called WL-27)</td>
<td>Internal consistency 0.88–0.91; test-retest reliability, no data (B.C. Amick III, personal communication [2])</td>
<td>Construct validity established</td>
</tr>
</tbody>
</table>

It is sometimes confusing to separate interventions at the client factor level or at the performance skill level. The separation may not be necessary: two or more approaches may be meshed in the same interaction with the client. The following are approaches provided through the occupational therapy framework as applied to the clients described in this paper.

**PREVENT DISABILITY** and further injury

- By exploring the clients current capacities and limits, matching the capacities with required physical demands, through instruction, demonstration of risk factors that could aggravate the current injury and by revising their occupational balance (*client factor, activity demands, performance patterns*);
- By modifying work demands using modified tools and changes in performance patterns (*performance patterns, performance skills and activity demands*);
- By educating the employer representatives, the medical and other rehabilitation providers as well as the insurer about the rehabilitation process, keeping them informed of the progression of the rehabilitation plan, the progression of this particular client’s work performance, and welcoming their input to facilitate the process (*context*).

**MODIFY, COMPENSATE, ADAPT**

- By compensating the residual lack of performance skills and patterns in some work activities through tools, pacing or sequencing (*activity demands, context, performance patterns*);
- By compensating difficulties encountered at home by providing alternate ways of doing home related functional problems (*client factor, performance patterns, context*).
Table 3  Major papers reviewed with decreasing levels of evidence

<table>
<thead>
<tr>
<th>Level of evidence</th>
<th>Paper</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Systematic reviews of RCT</td>
<td>Shonstein et al. [27]</td>
<td>Physical conditioning, ergonomic interventions at the workplace and adding a cognitive-behavioral approach to a non-clinic based treatment are the most effective approaches to help injured workers return to work</td>
</tr>
<tr>
<td>Systematic review of RCTs and prognostic studies</td>
<td>Kuiper et al. [20]</td>
<td>Only the client’s own expectations of recovery is a consistent predictor of return to work in all studies reviewed</td>
</tr>
<tr>
<td>Systematic review of observational studies and below</td>
<td>Maceachen et al. [22]</td>
<td>Strong evidence that work disability duration is significantly reduced by work accommodations offers and contact between healthcare provider and workplace</td>
</tr>
<tr>
<td>Observational prognostic study</td>
<td>Baril and Berthelette [3]</td>
<td>Presence of a modified duties position and a structured return to work program facilitates return to work among injured workers</td>
</tr>
<tr>
<td>Cohort data, experimental design</td>
<td>Gross et al. [16]</td>
<td>Use of a short form commercial FCE can provide useful information on the worker’s capacity to do the work when the work demands are known and mirrored by the three subtasks</td>
</tr>
<tr>
<td>Non systematic review of RCTs and observational studies</td>
<td>Durand et al. [9]</td>
<td>Data on the Oswestry Disability Questionnaire and the pain numerical rating scale, empirical clues from therapists as to what facilitates or hinders return to work which are not research-based predictors of work disability</td>
</tr>
<tr>
<td>Case report (interview with therapists)</td>
<td>Fisher [12]</td>
<td>The Worker Role Inventory content, description and its use in addressing a holistic view of the worker in a rehabilitation process</td>
</tr>
</tbody>
</table>

activities or modifying current occupational balance (performance patterns).  
– By educating the social environment including the family, the employers and the insurer about the process and prognosis of the individual (context).

MAINTAIN work status
– By carefully monitoring the activity demands on their work performance and functional capacities at home (activity demands, context).
– By exploring and mastering pain management techniques (client factors)

RESTORE physical fitness levels (strength, coordination, aerobic capacity)
– By designing a fitness program using home-based activities (client factors, activity demands, performance patterns and skills)
– By gradually increasing the physical demands at work through a return to work plan (client factors, activity demands, performance patterns and skills)

5.2. Discharge planning

According to Portney and Watkins [25], the characteristics of responsiveness of a test can be considered a component of the test validity. Occupational therapists working with individuals with CLBP getting back to work can use the same tools for evaluation and for discharge planning. Most tools used, except the short-form FCE and the PNRS, are based on the worker’s perception of his capacity to perform work-related and non work-related tasks, which is the most prominent predictor of return-to-work. The observation and analysis of the actual performance of workers in their work context adds a strong component of validity to any intervention based on the results of this analysis. Using a non or semi-structured interview with the employer to determine their perception of the worker’s performance adds another validity component. Indeed, the employer is an important stakeholder who can facilitate or discourage the therapeutic interventions.

6. Conclusion

In this paper, an attempt was made to apply the occupational therapy framework with a clientele of workers with CLBP returning to work, based on the scientific evidence, using an occupation-based practice frame of reference and the author’s experience in this area of rehabilitation. Evaluation tools were chosen according to their relationship with predictors of RTW with this population. Research concludes that workers’ perceptions of their capacity to work is the most prominent predictive factor for RTW. This perception appears to be determined by their beliefs, values, fitness level, accommodation possibilities at work and work physical and organizational demands. Intervention approaches
made at the worksite are encouraged as they tend to bear better outcomes. Whether it is because the need for learned skills carry over is decreased for clients, or because of the compound influence of client factors, performance skills and patterns as well as physical and organizational demands is yet to be found. Finally, by no longer considering the RTW outcomes as a dichotomous variable, but rather as a stratified variable based on the extent of residual capacities and incapacities, occupational therapy interventions can not only assist clients with CLBP increase their participation in life activities including work, but doing it while making sure it has an added benefit in their overall health and quality of life.

References

dimensions of pain catastrophizing: social cueing effects on

143–159.