

**Title:**

**Fostering stay at work after a period of disability: a scoping review of occupational rehabilitation strategies to support workers in the adoption of preventive behaviours**

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## **Abstract**

**Purpose.** Based on the theoretical framework of the Model of Preventive Behaviours at Work, the aim of this study was to describe the the occupational rehabilitation strategies the literature reports that support workers who have suffered an occupational injury in adopting preventive behaviours .

**Methods.** To conduct this scoping review, we used a systematic methodology in 7 steps : 1) definition of the research question and inclusion/exclusion criteria, 2) scientific and gray literature search, 3) determination of manuscripts' eligibility, 4) extraction and charting of information, 5) quality assessment, 6) interpretation, and 7) knowledge synthesis.

**Results.** We selected 46 manuscripts of various types (e.g. randomized trials, qualitative studies, governmental documents). Manuscripts were mainly of good or high quality according to our quality assessment. The strategies for coaching, engaging, educating and collaborating were mostly reported in the literature to support the development of the six preventive behaviours during occupational rehabilitation. The results also suggest that heterogeneity exists regarding the specificity of the strategies reported in the literature, which may have hindered our ability to provide rich and detailed descriptions. Literature also mainly describes individually oriented behaviours and reports strategies requiring a low level of worker involvement, which represent issues to adress in future research projects.

**Conclusion:** The strategies described in this article represent concrete levers that occupational rehabilitation professionals can use to support workers in the adoption of preventive behaviours at work on return from having suffered an occupational injury.

**Keywords:** Rehabilitation, occupational injury, preventive behaviours, stay at work, scoping review, disability, work

### **Implications for Occupational Rehabilitation**

- This scoping review offers an educational resource for occupational rehabilitation professionals wanting to support workers in the adoption of preventive behaviours when returning to work after an occupational injury.
- Occupational rehabilitation professionals should consider focussing on the development of environmentally oriented behaviours and stimulate the involvement of the worker while developing preventive behaviours.
- The publication of logic models about the interventions that rehabilitation includes seems to be a favourable avenue for offering professionals rich information not only on the interventions but also on the relationships between them, their objectives and theoretical foundations.
- To improve the quality of the information available in the scientific literature, occupational rehabilitation researchers would benefit from using standard grids for describing intervention strategies, thus optimizing its use in research and practical settings.

## **Introduction**

Most workers who suffer an occupational injury, whether it is an accident, physical illness or mental health problem, recover and gradually return to their roles and occupations [1-3]. However, many have difficulty remaining at work in the long term, despite receiving rehabilitation services [4, 5]. In fact, the number of workers in Quebec, Canada, who require rehabilitation services before returning to work has increased in the last decades [6]. The global outlook also suggests that the number of workers requiring rehabilitation services because of an occupational injury will increase in the coming years [7]. Moreover, the different trajectories of return to work after rehabilitation include nonlinear paths [8, 9]. For instance, nearly 15% of workers who receive rehabilitation services following an occupational injury experience a relapse, a recurrence or a worsening of their health condition after their return to work [6].

The results of international studies, which support Canadian statistics, suggest that although 85% of workers who suffer an occupational injury make a first return to work [5, 10], 11% to 48% experience a relapse, recurrence or worsening of their health condition [10-13]. These statistics are concerning since an unsuccessful attempt to return to work affects a successful sustained stay at work [8]. In this context, the stay-at-work period following a work stoppage because of an occupational injury is particularly critical [11] and complex [9, 14]. 'Stay at work' generally refers to a period during which the individual has returned to work without relapse or recurrence of disability absence, either full-time or part-time [15-18]. Several variables, both environmental and individual, influence its success [14, 15, 18]. For example, authors have found that peer and supervisor support [14, 19-21], type of work [22] and accommodation possibilities [14] are some of the environmental factors influencing stay at work after a period of disability.

Among individual variables, level of education [18], economic status [15, 18] and age [14, 19] would influence stay at work. Other personal characteristics of the worker to consider include the

worker's determination and ability to adapt [20], the capacity to set limits with colleagues [21], a positive attitude and a strong sense of self-efficacy [18]. Health conditions, such as pain or fatigue, also influence stay at work [14, 22]. Finally, workers' behaviours represent a relevant variable [23, 24].

Concerning workers' behaviours, studies have been conducted in recent years to develop and validate the Model of Preventive Behaviours at Work (MPBW), which defines the behaviours that workers can adopt to promote their health, safety and well-being, particularly from the perspective of fostering stay at work after a period of disability [25-27]. Although occupational rehabilitation professionals can use MPBW as a guide to prepare injured workers for their post-disability return and stay at work, authors reported that the interventions are often done intuitively and are highly variable regarding the development of preventive behaviour among workers [28, 29]. Authors previously suggested that issues of literature availability may explain this situation [24]. These authors reported that occupational rehabilitation professionals may have difficulty to access useful literature, which may hinder the interventions and strategies they adopt with workers [24]. In fact, the literature does suggest strategies for use during occupational rehabilitation to support the adoption of preventive behaviours after return to work and to help prevent relapse, recurrence or worsening of health status (e. g., stress-management techniques [30], role-playing to learn to understand a colleague's point of view [31] or education on communication tools [32]). However, this information is scattered across various sources and in multiple fields of knowledge, making accessing and using it difficult for occupational rehabilitation professionals. This represents a significant knowledge gap that compromises the practical use of research-based strategies.

To improve occupational rehabilitation practices favouring stay at work by supporting workers' adoption of preventive behaviours, the first step is to identify available information in the

literature, to create a basis on which we can build future studies, generating new knowledge on this topic of interest. The aim of this study was to describe the occupational rehabilitation strategies the literature reports that support workers who have suffered an occupational injury in adopting preventive behaviours .

## **Theoretical Framework**

### *Preventive behaviours at work: levers to foster stay at work*

Reflecting the idea that the individual, the environment and the interaction between them influence stay at work, MPBW describes behaviours that workers can adopt to preserve their health, safety and well-being, in relation to the environment in which they evolve [25, 27]. These behaviours are levers for use during rehabilitation to prepare a worker to return to work after a period of disability and, thus, help avoid relapses, recurrences and worsening of the health condition during stay at work.

MPBW suggests six types of preventive behaviours that workers may adopt for returning to work:

- 1) *Adopting a reflexive practice*. This behaviour implies that the worker reflects on actions in the work environment. Such reflection can take place before, during or after the action (e.g. analyzing work situations, identifying risks and making decisions for one's health, stepping back after an event that may have compromised health, safety or well-being);
- 2) *Pondering rules and procedures*. This behaviour implies that the worker has access to equipment and knows and applies the rules to protect health, safety and well-being (e.g. following work procedures, wearing personal protective equipment, taking breaks);
- 3) *Taking initiatives for health, safety and well-being*. This behaviour involves the worker being proactive and taking initiatives to maintain health, safety and well-being (e.g. participating in

workplace health and safety committees, suggesting ways to improve workplace well-being, using available resources);

4) *Caring about others*. Aware that work is a social occupation that requires interaction with others, this behaviour implies that the worker acts in a caring manner with respect to other members of the organization (e.g. helping colleagues or offering an attentive ear);

5) *Communicating*. The worker appropriately verbalizes concerns about health, safety and well-being (e.g. expressing needs to the supervisor or reporting risks to colleagues);

6) *Adopting a healthy lifestyle*. This involves taking care of one's health, safety and well-being beyond work, including other occupational and lifestyle habits (e.g. having a work-life balance or ways to manage stress).

Thus, to optimize the positive effects of preventive behaviours for all individuals in the workplace, the MPBW suggests that the behaviours can be directed towards the worker him/herself (e.g., *Adopting a healthy lifestyle*) or towards the environment, that is, the coworkers (e.g., *Caring for others*) and the organization (e.g., *Taking initiatives for health, safety and well-being*).

MPBW is a descriptive model that presents a systemic and multifactorial view of preventive behaviours. The identified behaviours are generally universal, but the environment, including contextual factors related to the individual, organization or society, largely influences their expressions (see the examples in the brackets in the section that presents the behaviours). In interactive dynamics, the worker's individual context (e.g. personal resources or training and experiences) influences his or her engagement in preventive behaviours. This individual context interacts with the organizational context and its various components (e.g. organizational practices, values and priorities, physical environment). The idea is that a positive interaction or fit must exist between the individual and organizational contexts to promote the worker's engagement in preventive behaviours. This interaction is also evident in the broader societal

context, with its norms, laws and cultures. Preventive behaviours must be a function of the context in which the worker adopts them. Thus, as other authors suggest [33], a supportive context allows the worker's involvement in preventive behaviours that positively influence long-term health, safety and well-being, and contribute to stay at work.

The study on which this manuscript reports addresses the six preventive behaviours, aiming to describe the occupational rehabilitation strategies the literature reports that support workers who have suffered an occupational injury in adopting preventive behaviours.

## **Methods**

### *Design*

A scoping review was conducted [34-36]. This method was chosen because it specifically examines the amount, range and nature of empirical and conceptual literature about a topic. It also has been found useful to organize published information [36], which is consistent with our objective to inform occupational rehabilitation professionals. This method was also chosen for its flexibility to include qualitative, quantitative, or mixed-method studies and other types of manuscripts, such as practice guidelines or research reports. Finally, scoping reviews lead to the creation of syntheses highlighting avenues for further research on a given topic.

To increase the scientific rigour of this article, the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews (PRISMA-ScR) checklist was used to report the information (see Appendix 1) [37].

### *Procedure and Analysis*

Despite the flexibility of the chosen method, we followed a structured procedure to ensure the rigour of our research work. Seven steps were systematically followed.



### Step 1: Define the research question and the inclusion/exclusion criteria

The research question underlying the study was: ‘What are the occupational rehabilitation strategies the literature reports that support workers who have suffered an occupational injury in adopting preventive behaviours?’ A rehabilitation strategy is defined as the use of a set of actions [38] to achieve a goal [39] by supporting a person, i.e. the worker, in a process of change to reach a target [40], i.e. the adoption of preventive behaviours at work. The inclusion and exclusion criteria for the manuscripts were: 1) concerning the population of adult workers with an occupational injury, i.e. accident, physical illness or mental health problem 2) addressing at least one of the six preventive behaviours of the MPBW and 4) describing at least one occupational rehabilitation strategy to support the development of preventive behaviours. In a holistic view of the process of rehabilitation, return and stay at work after a period of disability, the strategies identified can be used at various times and places, whether during rehabilitation in the clinic or in the workplace, once the return to work has begun. In accordance with the MPBW, which was developed using a transdiagnostic approach [27], no distinction was made with regard to the type of occupational injury. All types of manuscripts were eligible, and there were no limits on publication dates. Manuscripts written in other languages than English or French were excluded.

### Step 2: Conduct the Literature Search

In collaboration with a consulting librarian, we developed keyword combinations (e.g. return to work, rehabilitation, work-related, injury, disease) using six databases (i.e. CINAHL, Embase, Ergonomics Abstracts, Medline, PsycInfo, Web of Science) related to relevant fields of knowledge (e.g. ergonomics, psychology, rehabilitation, human resource management). An example of a complete search strategy for one database is available in Appendix 2. A second search examined the reference lists of the identified manuscripts. A manual search for practice guides or research

reports on the subject occurred on the websites of organizations with an interest in workers who suffer an occupational injury. Finally, a manual search on Google served to optimize the search for grey literature. Due to the large number of results generated by a Google search, we relied on relevancy rankings that suggest considering results emerging in the first pages [41]. Hence, the titles and manuscripts' description found in the first five pages were screened. Two members of the research team conducted the literature search.

### Step 3: Determine the Eligibility of Manuscripts

All manuscripts selected in step 2 were imported in the Covidence web-based software for managing literature reviews [42] and duplicates were removed. The literature selection was done by two members of the research team who separately screened the relevance of all selected manuscripts using a two-step approach: 1) screening from titles and abstracts – all titles and abstracts considered to be eligible by one of the two reviewers were selected for the following step, and 2) selection from full-text readings – the two reviewers had to agree on the eligibility of the manuscripts for selecting them for the next step (conflicts were resolved by incorporating a third reviewer). The determination for eligibility of manuscripts was done according to the relevance regarding our research aim and to the respect of the inclusion and exclusion criteria (see step 1) [43]. Collaborative meetings between reviewers occurred periodically in the process of determining manuscript eligibility, to ensure interviewer agreement. Figure 1 shows a flowchart [44] describing the literature search process and the final number of manuscripts.

*Please insert Figure 1 here*

### Step 4: Extract and chart the relevant information

Independently, two members of the research team extracted information from the manuscripts using an extraction grid, which decreases variability and bias in manuscript reviews [45]. The extraction grid used Hoffman's [46] Template for Intervention Description and Replication (TIDier)

criteria, to describe as concisely as possible rehabilitation strategies aimed at developing preventive behaviours. The grid included descriptive information about the manuscripts (e.g. origin of participants, objectives, methods), targeted preventive behaviours, and details of reported strategies according to TIDier's criteria (e.g. who is responsible for the strategy, when, how and why to apply it). We piloted this grid during the extraction of five manuscripts before revising and using it for all selected manuscripts.

#### Step 5: Assess Manuscripts' Quality

To increase the types of information regarding the strategies we identified and to offer an overview of the quality of the literature available on our topic of interest, we conducted a quality assessment on the selected manuscript. To account for the diversity of design, we used two complementary tools: the Mixed Methods Appraisal Tool (MMAT) [47, 48] and the Scottish Intercollegiate Guidelines Network Methodology Checklist 1: Systematic Reviews and Meta-analysis (SIGN) [49]. These tools enable assessing the quality of the manuscripts according to criteria specific to various research designs. The MMAT is used to assess the quality of manuscripts presenting studies with qualitative, quantitative, or mixed designs. The MMAT is a widely used tool in literature review-type studies [48] and has undergone several revisions [50, 51] and adaptations [52] over the years. In addition, the tool is recommended by the National Institute of Excellence in Health and Social Services[48]. The SIGN checklist allows for the assessment of manuscripts of the systematic review and meta-analysis type. The SIGN list is recognized as a high-quality analysis tool [53]; various systematic reviews have used it to assess the quality of manuscripts [54, 55]. Two members of the research team independently assessed manuscripts' quality and a third member resolved conflicts. Quality appraisal of manuscripts from the grey literature (e.g. government or professional documents) was not possible due to variability in the presentation of these manuscripts and the lack of an adequate tool. In agreement with the

method of the scoping review, the information about quality assessment remained descriptive; it was not used to withdraw manuscripts.

#### Step 6: Interpret the Results

To interpret the results and facilitate comparison across studies, we reported the strategies supporting the adoption of preventive behaviours according to the ten types of strategies in the Canadian Model of Client-Centered Enablement (CMCCE)[56]. In addition to providing a unified language, this practical model is widely used in Canada to support occupational therapy practice, notably, in occupational rehabilitation. Table 1 presents a brief description of these ten types of strategies as well as application examples.

*Please insert Table 1 here*

#### Step 7: Produce a knowledge synthesis to answer the research question

This final step refers to the creation of a knowledge synthesis that considers both the results and the methodological quality of the studies. According to the nature of the study objectives, we performed a convergent synthesis, a narrative that includes the results from both quantitative and qualitative studies [57]. The research team used an interpretive approach to produce this synthesis [58], which is consistent with the scoping review method [59]. All manuscripts were regarded as having the same level of importance in the narrative synthesis, regardless of their quality.

## **Results**

### *Statistical description of the selected manuscripts*

Forty-six manuscripts were retained; 20 randomized trials [4, 30, 32, 60-76], 6 systematic reviews [77-82], 5 non-randomized quantitative studies [83-87], 3 descriptive quantitative studies [88-90],

5 qualitative studies [28, 91-94], and 7 other study designs (e.g. narrative review, not mentioned) [31, 95-100].

Of the 46 manuscripts, 33 (70%) were written in 2010 or later. The majority (98%) were in English. Manuscripts were primarily published articles (98%); only one was a government publication (2%). Almost half of the participants (48%) on whom the manuscripts were based were Europeans. Table 2 illustrates the selection characteristics.

*Please insert Table 2 here*

Quality assessment for the 46 manuscripts shows that 16 (34.8%) were 'high quality' [28, 32, 64, 68, 70, 74, 75, 79-84, 91, 94, 100], 15 (32.6%) 'good quality' [4, 60, 62, 65-67, 69, 73, 77, 86-90, 99], 4 (8.7%) 'reasonable quality' [30, 63, 72, 78], and 4 (8.7%) 'low quality' [61, 71, 76, 85]. Seven manuscripts' (15.2%) quality could not be evaluated [31, 92, 93, 95-98]. Table 3 shows the distribution of manuscript quality by behavior. The main reason for lower quality manuscripts is that the evaluation of interventions was not blinded, or at least not named as such. This quality criterion refers to manuscripts reporting randomized trials. This quality criterion is missing for 11 of the 20 such manuscripts in our study, or 55% of them. Also, all manuscripts reporting descriptive quantitative studies were of lower quality overall, compared to the other designs.

*Please insert Table 3 here*

#### *Narrative synthesis of the strategies to support the development of preventive behaviours*

The results appear in terms of the six MPBW preventive behaviours. For each one, a synthetic manner characterized the narrative results, to highlight the different strategies for supporting the development of the behaviour based on the CMCCCE terminology. An integrative section closes the results to offer a critical synthesis of the strategies we identified.

### Behaviour 1. Adopting a reflexive practice

Forty manuscripts were identified concerning the development of the behaviour *Adopting a reflexive practice* [4, 28, 30-32, 60, 61, 63, 65-87, 91-99]. Strategies to support this behaviour can include to **educate** (n=9)<sup>1</sup> the worker about stress [61, 63, 80], pain [66, 86], symptom management [95, 96] or communication challenges [31, 95, 96]. This strategy can provide knowledge to the worker and enable thinking about how to manage these issues [72]. The literature suggests that information exchange can provide education in the context of a conversation or through written information.

Education provides the worker with knowledge that can promote **engagement** (n=15) in the adoption of reflexive practice [4, 32, 67, 69, 77-79, 98]. Basically, the authors suggest engaging workers in a problem-solving process through several modalities, including brainstorming [87], structured development of an action plan [60, 73], graduated exposure to problematic situations [71, 86] and self-assessment and analysis of work situations [94]. Trained professionals conducting motivational interviews would also stimulate the worker's engagement in reflective practice [65].

The worker can receive **coaching** (n=24) through individual [e.g., 70] or group interventions, [e.g., 97], to become aware of and modify affects and emotions [72, 75, 84] as well as thoughts and beliefs [63, 69, 76, 97, 99] and enable adopting a reflexive practice. Additional authors suggest that coaching workers in the appropriation of their problem-solving skills is important [28, 30, 68, 74, 78, 81-84, 92-96]. Such modalities as role-playing and simulation [28] may serve to implement this strategy. Acceptance and commitment therapy [91], including mindfulness [85], may also be an avenue for coaching workers in *Adopting a reflexive practice*.

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<sup>1</sup> In the Results section, the number presented in the parentheses following the strategy refers to the number of manuscripts that address it, according to our scoping review.

Last, professionals may **collaborate** (n=2) with workers to generate concrete solutions for resolving problematic situations at work [28], an attempt to enable them to act in partnership with their environment [93].

### Behaviour 2. Pondering rules and procedures

The 4 selected manuscripts [28, 73, 84, 94] suggest that to support the development of the behaviour *Pondering rules and procedures*, occupational rehabilitation professionals can **educate** (n=4) workers on different techniques to integrate into their daily routine, such as postural hygiene, joint protection, energy management [28, 94], warm-up exercises to perform before going to work, safe and alternative work techniques [84] and load-handling [73]. Modalities (e.g. demonstrations) can structure this teaching [84]. Furthermore, professionals can **collaborate** (n=1) with supervisors, by providing suggestions [84] to **adapt** (n=2) the environment so that it supports workers in respecting rules and procedures [28]. They can also **coach** (n=1) the workers by empowering them to use personal protective equipment and comply with the work procedures the environment prescribes [28]. This can occur by guiding and reframing the worker's actions in the clinic or during visits to the workplace, particularly by making checks and verifications. Finally, professionals may also **engage** the workers (n=1) in participating in training during clinic sessions, to practise the work techniques learned through adaptation and education [94].

### Behaviour 3. Taking initiatives for health, safety and well-being

We identified three manuscripts addressing the behaviour of *Taking initiatives for health, safety and well-being* [28, 67, 94]. To support the development of this behaviour, it is possible to **educate** (n=2) workers on the general aspects of health and the physiology of pain, using web-based information capsules. This education may provide workers with tools that allow them to take initiatives to implement ways of managing their health condition in their daily lives [67]. This education can also focus on workstation adaptation guidelines [28], which subsequently may

**engage** (n=2) workers to take initiatives to make changes that adapt their workstations [28]. Authors also suggest engaging workers in taking responsibility for their health, safety and well-being, especially by encouraging them to take initiatives to access support resources when they need them [94]. Last, occupational rehabilitation professionals can **collaborate** with workers (n=1) to set up a relapse prevention plan, to encourage taking initiatives to preserve post-disability health, safety and well-being [94].

#### Behaviour 4. Caring about others

Information about the behaviour *Caring about others* was extracted from two manuscripts [31, 94]. Applying the strategy of **collaborating** (n=1) can support developing this behaviour by engaging the worker in considering others. A six-step interpersonal-conflict resolution procedure invites the worker to understand others' interests [31]. Collaboration in combination with the worker's engagement can encourage caring about others, to foster workplace health, safety and well-being. Indeed, the study by Lecours and Groleau [94] suggests **engaging** (n=1) the worker to care about others through formal and informal encouragement [94]. Informal encouragement tends to reinforce an idea the worker mentions; formal encouragement is a suggestion or recommendation to the worker. The authors suggest that these encouragements may concern the importance of *Caring about others* for the proper functioning of teamwork. Thus, colleagues could return the support the worker offers when the worker might need it to stay at work.

#### Behaviour 5. Communicating

Twelve manuscripts documenting strategies to support the development of behaviour *Communicating* were identified [4, 28, 31, 32, 61, 69, 70, 84, 87, 94, 97, 99]. Occupational rehabilitation professionals can support the development of this behaviour by **educating** (n=8) the worker [32] on self-affirmation [4, 69, 84, 99], appropriate conflict management [31, 69] and strengthening interpersonal relationships [99]. This education can include group sessions [87] or



individual meetings between the professional and the worker, where teaching communication skills can occur [28]. The strategy could combine with **coaching** (n=2) of workers, in terms of communication with stakeholders (e.g. employers, colleagues, insurers) [94] or conflict management [61], especially by guiding and emphasizing workers' limits. This process may eventually help the professional to **engage** (n=1) workers in mobilizing themselves to express their expectations regarding the return to work [70]. Finally, occupational rehabilitation professionals can facilitate effective communication [97] to solve problems by using **collaboration** (n=1) with stakeholders.

#### Behaviour 6. Adopting a healthy lifestyle

Twenty-eight manuscripts were listed for behaviour *Adopting a healthy lifestyle* [4, 28, 30, 32, 61, 62, 64, 66, 67, 69, 70, 73, 76, 81, 83-92, 94, 96, 97, 100]. To support the development of this sixth behaviour, occupational rehabilitation professionals can **design or build** (n=1) personalized pain-symptom management methods that respect the worker's needs [96] or **adapt** (n=1) specific activities (e.g. physical activity), so the worker can include it in the customary routine [97]. In combination with this strategy, the occupational rehabilitation professional can **coach** (n=1) the worker to develop self-care and healthy lifestyle skills (e.g. taking time out, engaging in enjoyable activities, eating healthy, maintaining social contacts), including the use of a diary [76]. **Educating** (n=16) the worker may be part of this support, notably on pain management [4, 62, 64, 66, 67, 69, 85, 86, 88], energy conservation, burnout prevention [28, 32, 94, 96] and management of stress, time and depressive or anxiety symptoms [61, 69, 100]. This education can occur through a variety of modalities, such as initiation to relaxation [61] or focus groups [87]. Several manuscripts also present personalized activity programs [32, 83, 84, 91] or counselling meetings [64], to **engage** (n=17) the worker in the adoption of a healthy lifestyle [70]. For example, engaging workers in gradual recovery is a modality to prioritize [4, 30, 69, 73, 81, 84, 86, 88-90, 92, 100].

This can only happen if the professional **collaborates** (n=1) with the worker to redefine the daily routine and review the balance among the worker's different occupations [94].

#### *Critical Synthesis of Selected Strategies*

Analysis of the information extracted from the manuscripts leads to understanding that the occupational rehabilitation professional must not consider the strategies identified in isolation but rather in combination, to better support the development of each preventive behaviour. Indeed, some authors propose that strategies must be part of a global and holistic approach, suggesting that strategies are complementary [94, 96]. This idea of the importance of using multiple strategies simultaneously to support a person in achieving their goals, such as adopting preventive behaviors, is also shared by the authors of CMCCE [56]. Finally, the fact that several of the selected manuscripts address more than one strategy reinforces this idea. Table 4 presents this plurality of strategies for developing each behaviour.

*Please insert Table 4 here*

Among the strategies extracted, the majority of the manuscripts address some (e.g. coach, educate, engage) while others appear rarely (e.g. design or build, adapt) or not at all (e.g. advocate, consult, coordinate and specialize). This finding may result from the fact that these latter strategies are more about behaviours that the professional may adopt with stakeholders and not directly with the worker. For example, 'advocate' implies claiming for someone or something. In the context of this study, this strategy may illustrate what a professional can do to promote the establishment of conditions conducive to the worker's adoption of preventive behaviours, such as claiming access to adapted work equipment or funding.

The analysis also revealed heterogeneity in the specificity of the strategy descriptions. For instance, many manuscripts present only the 'what', i.e. the target of the strategy (e.g. teaching

about stress management), while others present the 'how', proposing modalities for implementing the strategy (e.g. diary).

## **Discussion**

The extraction and analysis of information from 46 manuscripts made possible describing various occupational rehabilitation strategies to support the adoption of the six preventive behaviours the MPBW describes, with the view to foster a sustainable stay at work after a period of disability. This study contributes to advancing knowledge regarding three main ideas: 1) the importance of the strategy specificity, 2) the need to focus on environmentally oriented behaviours, and 3) the added value of promoting workers' involvement.

### *Developing preventive behaviours: the importance of strategy specificity*

Results suggest heterogeneity in the level of specificity concerning the descriptions of the different strategies. Many of the strategies we identified have poorly detailed descriptions. Other authors have also noted gaps in the quality of descriptions of clinical strategies in the scientific literature [e.g., 46]. This weakness may create issues not only for the application of strategies by professionals but also for their use in research when it hinders the ability to replicate studies.

We have chosen to present the different strategies according to the CMCCE [56]. The use of the unified language proposed facilitated comparison, by providing a common basis for describing the identified strategies. However, to guide occupational rehabilitation professionals in their practice with workers, further studies should provide a detailed description of the strategies for promoting the adoption of preventive behaviours at work. Since grids for structuring the description of strategies already exist (e.g. TIDieR scale; Hoffmann *et al.*, 2014), occupational rehabilitation researchers would benefit from using them to improve the quality of the information available in

the scientific literature and, thus, optimize its use in research and practical settings. Also, many of the manuscripts reviewed focus on the presentation of the strategies' effects, but few present the foundations that led to the development of the interventions. This limits understanding the action mechanisms behind the interventions, especially important since the results of a study involving practising professionals show that they appreciate being informed about both the directions to take in their practice and the theoretical reasons that support and justify the interventions [101]. The publication of logic models about the interventions that rehabilitation includes seems to be a favourable avenue for offering professionals rich information not only on the interventions but also on the relationships between them, their objectives and theoretical foundations [102, 103]. In fact, the recent publication of such logic models in the field of occupational rehabilitation represents relevant resources for professionals [e.g., 104, 105, 106]. The results of a systematic review support this idea, suggesting that intervention strategies and programs related to behaviours are more effective when based on a theoretical framework [107]. The need for scientific reflection among researchers, scholarly journals, funding agencies and practitioners, to understand the needs of each party, promotes a view to fostering more effective knowledge transfer through publications.

*Developing preventive behaviours: the need to focus on environmentally oriented behaviours*

The results of this study suggest that strategies are inconsistently documented across the six preventive behaviours (e.g. *Adopting a healthy lifestyle* has significantly more documentation than *Caring about others*). As a reminder, the MBPW suggests that behaviours can be directed towards the worker him/herself or towards the environment, that is, the coworkers and the organization [25, 27]. Considering this information, an interesting note is that preventive behaviours directed towards oneself (e.g. *Adopting a reflective practice*) have more studies

documenting strategies to support their adoption than behaviours directed towards the environment, such as coworkers (e.g. *Caring about others*) or the organization (e.g. *Taking initiatives for health, safety or well-being*). Since the MPBW proposes that the preventive behaviours a worker adopts be included in a system where different actors interact [27], stimulating the development of behaviours oriented equally towards the worker, coworkers and the organization is important to optimize the positive effects of preventive behaviours for all individuals in the workplace.

A recent study highlighted the role of interactions between the actors in the work environment in fostering sustainable stay at work after an occupational injury [14]. Indeed, the theory of social exchange [108] and the norm of reciprocity [109] enable highlighting the importance of the environment for stay at work. Social exchange theory predicts how a behaviour initiated towards an individual (e.g. helping a coworker with a task), which may be positive or negative, may engender another behaviour, again positive or negative, from that individual (e.g. offering to listen to a coworker). Based on this premise, a worker would engage in more beneficial preventive behaviours for coworkers (e.g. reporting a health risk to a coworker) or the organization (e.g. getting involved in the workplace health and safety committee) if the work environment also provides beneficial behaviours in return. Thus, the adoption of preventive behaviours by a worker towards the environment would, in turn, generate preventive behaviours towards the worker, helping to perpetuate sustainable prevention efforts in the workplace. As previous authors have reported the need to consider social exchanges in the workplace to promote successful stay at work [110, 111], conducting future studies is imperative for improving knowledge about strategies that occupational rehabilitation professionals may use to support the development of peer- and organization-oriented preventive behaviours.

*Development of preventive behaviours: the added value of encouraging worker involvement*

The results of this study suggest that the strategies the literature identified to support the adoption of preventive behaviours at work are of varying intensity with regard to the involvement they require of the workers. According to the CMCCE's enabling strategies [56], engaging, coaching and collaborating would elicit more worker involvement, as they require the worker to act. Using this information to interpret this study's results, we may conclude that the required worker's involvement varies according to the strategies used to support the development of different preventive behaviours. The behaviours associated with *Adopting a reflexive practice* and *Adopting a healthy lifestyle* are essentially developed through coaching and engagement, which strongly encourage worker involvement, notably through exposure, self-evaluation or diary, to support them in analyzing work situations or changing lifestyle habits. However, other behaviours are developed from more passive strategies (e.g. *pondering rules and procedures* or *communicating*), promoted mainly through education, i.e. one-way information transfer.

This reflection is relevant since the importance of the individual's involvement is a success factor in the literature on rehabilitation interventions. Indeed, Dawson et al. [112] suggest that cognitive rehabilitation interventions based on problem-solving and the individual's involvement have the potential to promote learning retention. Also, to optimize the transfer of learning from the clinical setting to the real-life setting—i.e. the workplace—Babulal et al. [113] invite rehabilitation professionals to adopt interventions that generate active involvement from individuals. Literature in the field of pain self-management also suggests the necessity of combining education with other personalized strategies that involve the worker [107, 114], such as coaching to promote reflection on thoughts and emotions or engagement in an activity program [115]. It is therefore important to ensure that the strategies generate worker involvement. Stimulating the worker's involvement through innovative applications of the strategies that advocate, consult, coordinate

and specialize, which have not been documented yet with regard to the development of preventive behaviours at work, could be interesting.

### *Strengths and Limits*

This study used a structured and transparent methodology to ensure the validity and exhaustiveness of the literature search and the reproducibility of the research. The chosen method allows the identification of the topic's relevant manuscripts and enables a quality assessment of them, an added value to our scoping review. However, two of the manuscripts the literature search selected were authored by one of the lead researchers in this study. In order to decrease the risk of bias, the eligibility determination, extraction and interpretation of data from these manuscripts were handled by two noncontributors. It is also important to note that the lack of specificity of the strategies identified in the literature may have hindered our ability to provide rich and detailed descriptions in our results. Finally, this scoping review presents the state of knowledge at a fixed point in time. Thus, this exercise may require repetition in the future. Also important to remember is that the results of this study require cautious interpretation; the context in which the worker evolves largely influences the adoption of preventive behaviours. The behaviours should never be considered alone, and occupational rehabilitation professionals are invited to take the worker's context into account in the strategies they propose. Further research will guide professionals in this regard.

### **Conclusion**

This article presents a study aiming to describe the occupational rehabilitation strategies the literature reports that support workers who have suffered an occupational injury in adopting preventive behaviours. We identified 46 manuscripts proposing strategies for use in rehabilitation, to support the development of preventive behaviours at work and the prevention

of recurrence, relapse or worsening of workers' health status after a period of disability. The strategies for coaching, engaging, educating and collaborating were mostly reported in the literature to support the development of the six preventive behaviours during occupational rehabilitation. Although there was heterogeneity in the description of the strategies across manuscripts, the use of the unified CMCCE terminology [56] reduced the resulting language gap and, thus, facilitated an overall understanding of the strategies identified. Also, individual-oriented preventive behaviours (e.g. *Adopting a reflexive practice*) are documented significantly more than environment-oriented behaviours (e.g. *Care for others*). Moreover, strategies that require less involvement on the part of the worker tend to favour the development of certain behaviours. Since the individuals' level of involvement influencing their adoption of behaviours has been documented [112-115], strategies that generate more involvement, such as coaching or collaboration, are recommended. However, the findings suggest that further studies to develop theoretically based strategies to support the development of environmentally oriented preventive behaviours and encourage worker involvement are advisable. Nonetheless, we reached the aim of this study as this scoping review offers an educational resource for occupational rehabilitation professionals wanting to support workers in the adoption of preventive behaviours when returning to work after an occupational injury.

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### **Statements and Declarations**

### **Acknowledgements**

This study would not have been possible without the colossal documentary research work of the following assistants and research professionals: Laurence Quenneville, Corinne St-Pierre, Annabelle Verville and Lysanne Scalabrini. Special thanks to Roxanne Bédard-Mercier for her support in the writing of this article. The invaluable assistance of the librarian Marie Denise Lavoie is also acknowledged.

### **Author Contributions**

All authors contributed to the study conception and design. Material preparation, data collection and analysis were performed by AL, with the support of MFC and MJD. The first draft of the manuscript was written by AL. MFC and MJD commented on previous versions of the manuscript. All authors read and approved the final manuscript.



**Declaration of interest**

The authors report no conflicts of interest

**Data availability**

The datasets generated and/or analyzed during the current study are available from the corresponding author on a reasonable request.

**Ethical Considerations**

Ethics approval was not required for the review of previously published scientific literature.

**Fundings**

This research was realized with the financial support of Institut de recherche Robert-Sauvé en santé et sécurité du Travail (IRSST), grant 2019-0031.