Integrative prevention at work: a concept analysis and meta-narrative review

Abstract

Purpose. The purpose of this study was to conceptualize integrative prevention at work and to identify its operational variables to support its application in occupational rehabilitation. **Methods.** Based on Walker and Avant's specifications for concept analysis, we conducted a systematic five-step procedure (i.e., 1-identification of research question, 2-literature search through meta-narrative review, 3-manuscript selection, 4-extraction, 5-analysis). **Results.** Analysis of information extracted from 20 manuscripts across diverse literature fields allowed to identify that the shared attributes of integrative prevention at work are: (a) coordination of the three levels of prevention, (b) integration of health promotion with prevention, (c) shared understanding of the goal, (d) engagement of stakeholders, and (e) variety of actions. The analysis also identified three antecedents and five consequences, situating the concept within the context of a change process. The results include recommendations for promoting the practical application of the concept. **Conclusion.** The results of this study offer an informative, non-prescriptive, and operational definition of integrative prevention at work that all the stakeholders involved, including occupational rehabilitation professionals, can use.

Keywords: concept analysis, integrated prevention, occupational health and safety, prevention, rehabilitation, work

Introduction

The prevention of occupational injuries and of occupational disability has attracted the interest of the scientific community and various stakeholders (e.g., companies, government, public health stakeholders) for many years [e.g., 1, 2]. While the subject is not new, it is still relevant because of the challenges of updating prevention activities in a changing world of work [3, 4]. Indeed, the current work context now includes contemporary and unprecedented societal phenomena, such as the COVID-19 pandemic, the aging of worker populations, and the critical shortage of labor. These phenomena lead to changes in the performance of work and may amplify the occupational risks that workers face (e.g., stress related to changes in rules and procedures, mandatory telecommuting, work overload caused by understaffing), as well as complexify the management of the consequences these risks may have on workers' health. [e.g., 5, 6-8]. These changes in the workplace challenge organizations to implement new prevention approaches and innovations to keep their workers healthy. In recent years, authors have introduced the idea of integrative prevention at work as a promising and contemporary avenue for approaching prevention [9-12]. To date, this concept is still emerging and difficult to conceptualize and operationalize, due to the various approaches used in different disciplines [9, 10]. The experience of our research team in using this concept to structure studies support this issue, which makes the use of the concept difficult, particularly in the field of occupational rehabilitation and prevention of occupational disability. This manuscript presents a study aimed at clarifying the concept of integrative prevention at work in the current context and proposes an operational conceptualization to promote its practical application in occupational rehabilitation.

State of Knowledge

The World Health Organization (WHO) defines health as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" [13, p.1]. The WHO describes three coexisting levels of prevention, namely primary, secondary and tertiary prevention [13]. These levels of prevention have been described regarding work [10]. *Primary prevention* concerns actions that aim to prevent the occurrence of an occupational injury. Its orientation is mainly toward the workplace, manifesting in such aspects as the design of new work situations, modification of the work layout, or training [10, 11]. *Secondary prevention* aims to halt or delay the progression of an occupational injury and its effects, with its orientation toward the worker [10]. It includes actions to monitor the health status of the population, detect workers at risk early, and implement measures to promote job retention or improve existing work situations [10, 11]. *Tertiary prevention* aims to reduce the risk of relapse and chronicity following an occupational injury [10], particularly through effective rehabilitation, efficient return-to-work process, and prevention of relapses, recurrences, or worsening of worker health status [10, 11].

The implementation of activities on the three levels of prevention, both within and outside of companies, involve various stakeholders from the health system (i.e., rehabilitation and nursing professionals, physicians), the work environment (i.e., ergonomists, managers, workers, unions), and the insurance industry (i.e., public or private insurer) [14-16]. These stakeholders play a critical role in the prevention of occupational injuries and of occupational disability. The literature suggests that such management, in terms of levels of prevention and the contributions of several stakeholders, is widespread but has its share of challenges [3].

The current state of knowledge shows frequent compartmentalization of the levels of prevention, which can be detrimental to the prevention actions that many stakeholders implement [10, 12]. These actions, occurring at different levels (e.g., primary or secondary prevention) and carried out in isolation from each other, prevent stakeholders (e.g., employers or health professionals) from realizing the benefits of a more comprehensive, common, and sustainable approach [11]. Some studies have shown that uncoordinated actions and interactions between stakeholders may even represent a risk factor for work disability [17]. For example, authors report that the compartmentalization of actions and the lack of concerted action among stakeholders can result in workstations considered "light" sometimes being withdrawn from the system of job rotation accessible to all workers in order to accommodate only people on temporary assignment (tertiary prevention), which increases the exposure of the other workers to the risk factors associated with the other "more demanding" positions, by eliminating part of the benefits of the job rotation system (primary prevention). Amid transdisciplinary and decompartmentalized disciplines, and in the interest of those receiving health services [17, 18], improving this situation could involve integrating prevention at work [9-12].

The various stakeholders could benefit from the coordination of preventive actions, decompartmentalization of the levels of prevention and operationalization of their complementarity [9, 11], whether financial or for workers' health [19]. Within the company, separate stakeholders are often involved in reducing risks (e.g., health and safety committee in primary prevention) and promoting a return to work (e.g., human resources in tertiary prevention) [10, 11]. However, all these actors must juggle similar variables (e.g., legislative and insurance aspects) to promote the success of these interventions [20]. They would benefit from

addressing these situations together, in a holistic manner. For all workers, a comprehensive approach, including avoiding injuries via improved working conditions adapted to workers' characteristics and work activity, would promote both a successful return to work and sustainable retention. [11].

Dictionaries offer different definitions of the words "prevention" and "integrative." For example, the Merriam-Webster dictionary defines the word "prevention" as "the action of preventing (preventing from occurring or existing, holding back or keeping) or impeding" [21]. As for the word "integrative", the same dictionary defines it as "serving to integrate or favoring integration**:** directed toward integration" [22]. A word often found as an equivalent to "integrative" in the literature is "integrated", which means having "two or more things combined to become more effective" [23]. Although integration may aim to increase the effectiveness of prevention, these definitions remain broad and uninformative for the stakeholders involved in prevention of occupational injury and occupational disability, making its operationalization difficult [10]. In the scientific literature, definitions vary by discipline. Ergonomists first defined the concept, suggesting that it aims at designing or transforming work situations through coordination of the actions of the three levels of prevention in the workplace and with external stakeholders. [10, 12, 24]. In industrial medicine, the focus is on integrating preventive actions in the workplace with clinical health care and rehabilitation [25]. In human resource management, integrative prevention refers to the coordination of policies and practices aiming to simultaneously concern the prevention of workers' security, health and well-being issues with organizational productivity issues [26-28]. In public health, integrative prevention refers to the strategic and systematic integration of distinct environmental, health and safety policies and programs into a continuum of activity that improves the overall health and well-being of workers and prevents work-related injury and illness [29-31]. Although the literature recognizes the place of occupational rehabilitation and work disability prevention in definitions of integrative prevention [e.g., 32],the literature remains tenuous, and it is difficult to understand its mechanics and operationalization. **This study aims to conceptualize integrative prevention at work and to identify its operational variables to support its application in occupational rehabilitation.** Although some authors already conducted studies to define integrative prevention at work, these have been conducted in specific fields of literature (e.g., ergonomics workplace prevention interventions [24], mental health [33], musculoskeletal disorders [12], public health [29]), we made the epistemological choice not to target one field of literature, or a specific pathology. We wished to explore the various definitions in the different disciplines to highlight the shared characteristics of integrative prevention at work and propose a rich and useful conceptualization for application in occupational rehabilitation. In doing so, in this study, we contribute to the advancement of knowledge on integrative prevention at work through a concept analysis and meta-narrative. We were able to propose a conceptualization of integrative prevention at work by highlighting the shared characteristics that define it in the fields of literature related to rehabilitation, management, ergonomics, industrial medicine, public health, psychology and even economics. The attributes, antecedents, and consequences of integrated prevention that we propose resonate with occupational rehabilitation researchers and practitioners, who can use them as a scientific basis for developing interventions.

Methodology

Design. To define the concept of integrative prevention at work, this study used the concept analysis research design of Walker and Avant's [34] as a guide. This design allows identifying and deconstructing a particular concept into several variables, to properly distinguish it from neighboring concepts. By following systematics stages (e.g., select a concept, determine the purpose of the analysis, identify uses of the concept in different contexts and disciplines), it allows us to identify the main variables that define a concept, i.e., attributes (variables that identify the concept in reality), antecedents (variables that precede the concept), and consequences (variables that result from or flow from the concept) [35]. Doing so provides an operational definition of the concept under study, for use in both research and practice. The health field has commonly used Walker and Avant's concept analysis, as recent literature has defined work-related concepts, such as mental workload [36] or preventive behaviors at work [37].

Procedure and analysis. We followed a systematic five-step approach.

1. **Identification of the research question.** To include as many manuscripts as possible that had the potential to provide information about integrative prevention at work, it was necessary to ensure that the question was well-defined but broad enough to be sufficiently inclusive. Thus, the research question was: What is integrative prevention at work?
2. **Literature search.** To enhance the rigor of the literature search and review process, we used a systematic meta-narrative review strategy to plan and conduct our search strategy, data extraction, and analysis processes[38]. We chose a meta-narrative review strategy because it allows interpreting the meaning of terms, which is compatible with the concept analysis design. Also, meta-narrative review is a method proposed to synthesis the literature from a complex body of evidence [38], as it is the case in this study as we explored diverse fields of literature. The meta-narrative review offers a systematic method that provides the flexibility to include different types of documents (e.g., scientific articles, grey literature) [38]. Also, this type of review allows for a range of different approaches and disciplines to a topic rather than asking which is best, providing access to and synthesis of different perspectives on a common topic [38]. To ensure accuracy and rigor, the research team developed the literature search strategy in collaboration with a consulting librarian with expertise in the field. The keywords ("integrative prevention") OR ("integrative management") OR ("integrative approach") OR ("integrated prevention") OR ("integrated management") OR ("integrated approach") OR ("integrat* prevention") OR ("integrat* management") OR ("integrat* approach") AND "workplace" OR "work" were searched in the MEDLINE, CINHAL, and Web of Science databases because of their diversity of disciplines and research objects (e.g., rehabilitation, ergonomics, management, industrial medicine). The team also manually reviewed the bibliographic references of the selected manuscripts to ensure saturation. In addition, we included grey literature—e.g., reference books and research reports—using a Google search with the same keywords and a review of the references from the first five pages of the returned items.
3. **Manuscript selection**. We used the following inclusion criteria to select manuscripts relevant to answering the research question, choosing them if they: (1) addressed the topic of work, (2) addressed the concept of integrative prevention (i.e., proposed a definition of integrative prevention or addressed one of its variables), and (3) were written in English or French. Manuscripts that addressed levels of

prevention in isolation (e.g., only primary prevention) were excluded. To provide a contemporary picture of the concept, we admitted articles published within the last 15 years (i.e., 2007–2022). We entered the selected manuscripts from the various databases into the Covidence reference management software [39]. We eliminated duplicates, and the relevance of the articles with respect to the inclusion criteria was based on their title, abstract, and keywords. To ensure rigor in the selection of manuscripts, two team members performed this step, and when ambiguities arose, a third decided the matter. In a second phase, two team members read selected articles in their entirety, to ensure their relevance to the study objective. Team members held regular debriefing meetings to decide on including or excluding papers [40], communication that enhanced reflexivity and helped reduce the risk of personal bias [41]. Following this systematic search process, the analysis included 20 manuscripts[1], appearing in the flowchart in Figure 1.

Insert Figure 1 here

Figure 1. Flowchart of selected manuscripts to conceptualize integrative prevention at work

4. **Data extraction.** We extracted data from the selected manuscripts into a grid adapted from a template developed for concept analysis specification [42]. The extraction grid included descriptive information about the manuscripts (e.g., authors, country), methodological information (e.g., design, participants), and outcomes (e.g., attributes, antecedents, and consequences of integrative prevention at work). First, two team members used the grid to extract information from three manuscripts. Subsequently, they met in a debriefing meeting to modify and adjust the grid, to allow for even better extraction of information relevant to the research objective. These validation steps allowed the researchers to obtain the final version of the grid that they used to extract information from all selected manuscripts.
5. **Analysis.** We examined the data using a template analysis strategy. Template analysis is a form of thematic analysis compatible with many qualitative research designs and useful for analyzing information from the literature [43].

   Initially, an entire reading of the corpus (i.e., data extracted via the extraction grids) supported obtaining an overall picture of the collected data. Several additional readings ensured a sense of the researchers' immersion in the data corpus. Initial coding began with assigning descriptive codes to the meaningful ideas in the data. Throughout the analysis, the team members kept the purpose of the study in mind, to ensure the relevance of the proposed coding. Next, we grouped the codes into broader themes. In accordance with the concept analysis design, three themes were used a priori (i.e., 1: attributes, 2: antecedents, and 3: consequences). This led to generating a general structure and allowing the researchers to propose links between the selected codes and the themes. Several rounds of applying the data from the extraction grid to the proposed general structure made it possible to refine the analytical process. Throughout the analytical process, the research team members verified and discussed the identified meaning units, assigned codes, and the structure they produced. This interpretation by the research team is essential since the concept analysis is influenced by the posture of the research team members [34]. Our team is composed of researchers from the disciplines of

[1] The list of manuscripts selected to conduct the concept analysis is presented in Table 2.

rehabilitation, public health, ergonomics, industrial relations, psychology, and human resource management, which is a richness for this study concerning the concept of integrative prevention at work. Several consensus meetings among research team members took place during the study, particularly during the development of the research strategy, the extraction of data and the final synthesis.

Results

This section presents the results of the study. A description of the selected manuscripts is first presented, followed by some definitions and uses of integrative prevention at work. Our main results concern the presentation of the shared variables that define the concept of integrative prevention at work. Finally, we offer recommendations for promoting the practical application of the concept.

Description of the manuscripts

The systematic search process produced 20 manuscripts that met the selection criteria (see Table 2), 75% of which had been published within the last 10 years (n=15). Only one paper was written in French; the others were in English. More than half (n=11) were scientific articles, and 65% related to general health (n=13). Table 1 describes the characteristics of the selected manuscripts.

Table 1. Characteristics of selected manuscripts (n=20)

Insert Table 1 here

Definitions and uses of integrative prevention at work

Our analysis of the selected manuscripts offers a picture of the definitions and uses of integrative prevention at work across disciplines. In ergonomics, a recent scoping review aimed at identifying workplace integrative prevention approaches proposed the following definition of integrative prevention: "An approach that coordinates several workplace prevention levels (primary, secondary or tertiary) aimed at reducing or preventing [musculoskeletal disorders], mental health issues or other injuries and disabilities, and that encourages a culture of health and wellbeing in all spheres of the company through involving each organizational level and different internal and external stakeholders in a participatory process" [24, p.16]. In public health, a review of the literature suggests that integrative prevention at work is mainly used to combine protection and promotion of health of workers and reports this definition which has been taken up by other authors: "Workplace health protection and promotion is the strategic and systematic integration of distinct environmental, health, and safety policies and programs into a continuum of activities that enhance the overall health and well-being of the workforce and prevents work-related injuries and illnesses" [31, p.S13]. In human resources management, results of a theoretical study aiming to describe the evolution of integrative prevention approaches in workplaces suggested that integrative prevention at work is used as a means of recognizing the interrelationship between employee health and business productivity [27]. In psychology, a book chapter suggest that integrative prevention at work is used to simultaneously prevent hazards (reduce risk factors in the workplace), promote the positive (develop the positive aspects of work and the strengths of workers and their abilities), and manage disease (address health problems among workers regardless of their causes) [33]. In occupational rehabilitation,

an evaluation study suggested that integrative prevention at work may be used to integrate secondary prevention actions with existing primary prevention resources to ensure effective safe prevention and early return to work [32]. Our results suggest that integrative prevention have been studied with multiple health problems, such as musculoskeletal disorders [12] or mental health issues [33, 44], and with different geographical populations, such as Australia [26], the United States [45, 46] or Canada [32].

Presentation of the defining variables of the concept of integrative prevention at work

The analysis of the selected documents allowed for a precise and specific description of the attributes, antecedents, and consequences defining integrative prevention at work, as exposed in Figure 2. Table 2 shows the references that identified each, and presents the complete list of selected manuscripts (n = 20).

Insert Figure 2 here

Figure 2. Attributes, antecedents, and consequences of integrative prevention at work.

Table 2. Variables of the concept according to the selected manuscripts

Insert Table 2 here

Attributes. Analysis of the data extracted from the 20 selected manuscripts led to the emergence of five shared attributes: (1) coordination of the three levels of prevention, (2) integration of health promotion with prevention, (3) shared understanding of the goal, (4) engagement of stakeholders, and (5) variety of actions. That is, these five attributes must be present for integrative prevention at work to occur.

Coordination of the three levels of prevention is necessary to carry out prevention actions in a synergistic manner. As Vézina et al. (2018) [10] mention in their book chapter, it is important to take a critical look at the use of the traditional levels of prevention (i.e., primary, secondary and tertiary) since " actions proposed at one level can be used to achieve the intended effects at multiple levels of prevention" (p.19). For instance, the authors give the example of hygiene measures traditionally associated with primary prevention, which can also certainly contribute to the objectives of secondary and tertiary prevention. Therefore, the three levels are not exclusive and should be considered in combination [47, 48]. This coordination between levels of prevention is also relevant since, according to Rudolph et al. (2001) [25], "primary prevention failures require secondary and/or tertiary prevention efforts " (p.308). Moreover, this attribute suggests that integrative prevention simultaneously involves all populations targeted by the three levels of prevention, as Kirsten (2010) [28] mentions in a review article in the field of industrial medicine:

> One of the most important principles in health management is to address the health of all employees, not only the sick and disable ones. Unfortunately, most employers still only focus on the employees who are on sick leave and short or long-term disability with the goal of re-

integrating them into the work process. This thinking neglects the fact that employees who are low-risk move into the medium- or high-risk categories and in the end, you have more people who became high-risk than people who reduced their risk (p.254).

The second attribute of the concept of integrative prevention at work **is the integration of health promotion with prevention** activities. The WHO defines health promotion as "the process of enabling people to increase control over their health and its determinants, and thereby improve their health" [49, p.10]. This attribute includes encouraging employees to engage in healthy behaviors, both at work and at home [31]. It would enable a more comprehensive and holistic understanding of workers' health, according to the results of a systematic review about the effectiveness of integrative prevention approaches: "Integrated approaches combine occupational safety and injury prevention with health promotion to protect and promote worker health, safety, and well-being" [29, p.401].

The third attribute of integrative prevention at work that emerged from the data analysis is a **shared understanding of the goal**, implying an integrative prevention goal among all the stakeholders involved, despite their distinct fields of practice. Indeed, stakeholders must have a common understanding of prevention to collaborate and act more effectively on its behalf: "Sharing common knowledge and understanding of workers' activities among stakeholders would improve intervention outcomes" [24, p.8]. Knowledge sharing and training can facilitate this common understanding [11].

Similarly, the **engagement of stakeholders** is necessary for integrative prevention at work to manifest itself. Each stakeholder must know and play its role and invest in others [12, 31, 47, 48]. According to the scoping review of Calvet et al. (2021) [24], this is an important characteristic to promote the "cooperative participation and involvement of stakeholders" (p. 905). According to the results of an interdisciplinary literature review about integrative approaches regarding work stress, one way to foster this engagement is for stakeholders to know each other well enough to engage in actions that respect their interests, strengths, and challenges [44].

Variety of actions is another defining variable of integrative prevention at work. The literature suggests different types of actions to contribute to this variety as suggested by Sorensen et al (2013) in a literature review in the field of public health:

> […] management programs, employee assistance programs, human resources and benefits, and efforts to promote work-family linkages can strengthen efforts to promote and protect worker health. Similarly, clinical medical services provided by employers may include onsite occupational health clinics to provide better access for prevention, surveillance, treatment of work-related injuries and illnesses, as well equally accessible clinical support services for health promotion and wellness [31, p.S15].

We can also find actions concerning the work environment [45], training of employees and supervisors on basic principles of ergonomics, health promotion, and teamwork, [50] or coaching and awareness for employees [45].

Antecedents. The data extracted from these manuscripts suggest three antecedents: (1) access to resources, (2) recognition of the benefits of integrative prevention, and (3) motivation to implement integrative prevention. **Access to resources** is a prerequisite for operationalizing integrative prevention. Minimal financial

resources [48, 51] and a budget allocated to prevention activities [46] would be essential to implementing the attributes of integrative prevention in the workplace. According to Nelson et al. (2015) [51], in a qualitative study aiming to describe perceptions and feasibility of implementing and integrative approach in small and medium-sized businesses, "resources, both in terms of personnel and financial costs, were mentioned as vital considerations when selecting new programs and policies" (p.172). Human resources would also be important for orchestrating an integrative prevention approach and preventing companies from giving up for lack of personnel [44]. Finally, stakeholders must have time for integrative prevention [26]. **Recognition of benefits** is another antecedent of integrative prevention at work, including the financial outcome of integrative prevention as an important mobilizing or demobilizing factor [10]. According to Nelson et al. (2015) [51]:

> Respondents were asked what would be necessary in order for their company leaders to consider an integrated approach. Seven reported that demonstrating a benefit to the company would be necessary for their company leadership to consider an integrated approach (e.g., it saves the company money, is beneficial for employment branding, increases safety) (p.173).

Thus, the need to link employee health and productivity is another benefit that requires recognition: "Making the link between employee health and productivity is a necessary step to assess the full impact of poor health" [28, p.254]. The other element that must precede integrative prevention is the **motivation to implement it**. The scientific literature has raised various vectors of motivation, such as "legal, financial, and moral reasons" [30, p.S35] as suggested by a literature review in public health concerning the characteristics of integrative prevention programs.

Consequences. Reading and extracting information from the 20 manuscripts for this study enabled identifying five main consequences of integrative prevention: (1) positive financial impacts, (2) reduction in occupational injuries and disability, (3) improvement in workers' lifestyle habits, (4) reduction in stressors, and (5) improvement in working conditions. It should be noted that, compared to the attributes and antecedents, our analysis process led to the understanding that many of the consequents are presented as speculation, not always having been formally demonstrated. This information is relevant to keep in mind when interpreting the results of this study.

Integrative prevention could have **positive financial impacts** on companies. In fact, according to several authors [27, 32, 52], this approach could reduce companies' spending on health costs and enable them to make money in the long run: "Integrating health promotion and health protection efforts may […] potentially reduce costs" [31, p.S12]. Implementing integrative prevention in the workplace could also help **reduce occupational injuries and worker disability** [26], including "avoiding the occurrence of musculoskeletal disorders in unaffected workers, avoiding the transition to chronicity [...] and promoting job retention for individuals with severe disabling musculoskeletal disorders" [10, p.20]. Furthermore, according to Sorensen et al. (2018) [53], in a literature review in the field of public health, there is growing evidence about the potential benefits of integrated approaches for "reductions in pain, occupational injury, and disability rates" (p.430). Results of several studies also support the idea that integrative prevention leads to the adoption of **healthy lifestyle habits** among workers, whether it is related to smoking [26, 50], physical activity [26, 50], or eating habits [50]. This is also an aspect highlighted in an article about the development of an assessment tool of integrative prevention by

Sorensen et al (2018) [53], which states that "researchers have reported benefits to this integrated systems approach, including reductions in pain and occupational injury and disability rates; strengthened health and safety programs; improvements in health behaviors; enhanced rates of employee participation in programs; and reduced costs" (p.430).

Stressor reduction is another important consequence of integrative prevention.

> The key point is that workplace stressors, in the sense that they are adverse workplace exposures, can be fully addressed through OH&S [occupational health and safety], whereas stress, strictly speaking, can arise through a combination of work- and non-work-related circumstances and can be addressed through integration of OH&S, health promotion, and other approaches [47, p.222].

In this sense, integrative prevention makes it possible to act globally to reduce stressors, beyond those taking place exclusively in the workplace. The primary prevention level makes it possible to prevent exposure to stressors, the secondary level to modify the worker's reaction to the stressor, and the tertiary level to minimize effects [33]. In addition, the control of these stressors could have a positive impact on the health of workers [26, 33]. The last identified consequence of integrative prevention at work concerns the **improvement of working conditions** [53]. Authors suggest benefits on different indicators including "job quality" [29, p.404] and "work climate" [32, p.178]. Lamontagne et al. (2019) [33] , in a book related to mental health at work, also suggest that integrative prevention at work allows the development of "positive organizational attributes" (p.216), and McLellan et al. (2019) [45], in a book chapter concerning integrative prevention in large health care organizations, speak of creating "working conditions supportive of health and safety" (p.146).

Context. Finally, the concept analysis raised the idea of integrative prevention at work as part of an overall context of change processes that can influence antecedents, attributes, and consequences. Along the continuum of integrative prevention implementation in the workplace are changes in the worker, the work teams, and the organization [45]. Specifically, cultural and environmental changes in the organization are necessary for the successful implementation and application of integrative prevention: "Implementing complex interventions [integrative prevention] usually requires making a multitude of interconnected changes in organizational structures and pursuits" [51, p.173]. Changes in the company also reflect the manifestation of integrative prevention at work: "[The] integrated approach reflects an organizational transformation and a culture of health and safety that supports worker health both within and outside the workplace" [31, p.S13]. Finally, change can also be a spinoff of this prevention approach, resulting in "transformations in work situations" [10, p.25].

Recommendations for the implementation of integrative prevention at work

The analysis of the information from the 20 selected manuscripts also enabled identifying nine useful recommendations for stakeholders, including occupational rehabilitation professionals, to promote the practical application of integrative prevention at work. Although these recommendations have yet to be validated and are probably still incomplete, they represent concrete levers to facilitate the implementation of integrative prevention approaches. Table 3 presents these nine recommendations and the authors who suggested them.

Table 3. Practical indications for stakeholders to promote integrative prevention at work*

Insert Table 3 here

The suggested recommendations are in line with the definition of integrative prevention at work that has emerged from this study. Indeed, these recommendations link to one or more attributes, antecedents, consequences, or even the context of the concept, as part of a change process. For example, the importance of stakeholders' engagement appears (attribute 4) in the recommendation to encourage employee commitment (recommendation 5), support for employers (recommendation 3), and the formation of a committee (recommendation 4). These recommendations show that each actor must be aware of his or her role and maximize his or her commitment to promote the implementation of integrative prevention at work. Also, allocating a dedicated budget to the program (recommendation 1) is in line with antecedent 1, which proposes that one must have access to resources to carry out integrative prevention. These links between the recommendations and the variables of our conceptualization of integrative prevention at work support its practical application.

Discussion.

The purpose of this study was to conceptualize integrative prevention at work and to identify its operational variables to support its application in occupational rehabilitation. Using a concept analysis design and meta-narrative review strategy, interpretation of information from 20 manuscripts identified in diverse literature fields allowed to propose five shared attributes regarding the involvement of stakeholders and the different actions whose implementation can lead to manifesting integrative prevention at work. The results also highlighted three antecedents related to the vision and planning of the concept's application, as well as four consequents that suggest positive benefits for all stakeholders involved. These findings provide a comprehensive understanding of the concept of integrative prevention at work, which intrinsically links to a change process. Recommendations also promote the practical application of the concept by stakeholders, including occupational rehabilitation professionals. This study contributes to the advancement of knowledge based on two key ideas: 1) the benefits of integrating health promotion into workplace prevention and 2) the importance of considering the exchanges between stakeholders to optimize integrative prevention at work.

Integrative prevention at work: The value of incorporating health promotion into its definition

The results of this study suggest that integrative prevention at work manifests itself not only in the coordination of the three levels of prevention (i.e., primary, secondary, tertiary) but also in health promotion. Although some work suggested the relevance of combining health promotion and prevention (e.g., the Total Worker Health® program which suggests combining health protection and health promotion [46], or stress management approaches that propose a combination of mental health promotion and protection [47]), previous definitions of integrative prevention at work have not formally identified this idea; they focus more on coordinating primary, secondary, and tertiary prevention and include little promotion in their definition [e.g., 10, 24, 25]. Interpreting the results of this study leads to the idea that formalizing the integration of promotion into preventive approaches can multiply the positive benefits for workers' health, in particular by going beyond the workplace for effects on other health-related behaviors (e.g., encouraging the adoption of healthy behaviors, such as physical activity and the adoption of better dietary habits, and decreasing risk behaviors, such as tobacco

use) [31]. This idea is all the more relevant as many studies have raised the link between working conditions and the health-related behaviors and health status of workers [e.g., 54, 55, 56]. Although health promotion is already present in the workplace [e.g., 57, 58], few studies defining integrative prevention at work formally explored the combination of prevention and promotion. However, some authors investigated this idea in other health-related contexts (but work) and found promising results. For example, physical activity as a means of promotion and prevention is an avenue that is increasingly used to prevent the onset of mental health problems and reduce depressive and anxiety symptoms, particularly among young adults [59, 60]. In another area, study results suggest that in addition to treating HIV cases and providing preventive interventions, integrating sexual health promotion activities strengthens existing prevention [61]. As for traffic-accident prevention, promotional campaigns emphasizing road-user behaviors, such as seatbelt use or adherence to speed limits, are effective strategies for decreasing accidents, in combination with putting in place prevention actions (e.g., road system infrastructure, safer vehicles) [62]. Further studies are required to verify whether comparable benefits are applicable to the work context. Finally, the addition of health promotion seems to align perfectly with a definition of holistic health (i.e., more than the absence of disease), such as the one chosen in this study [63]. Thus, to occur in a coordinated manner, promotion in stakeholders' conceptualization of integrative prevention for action is necessary, including the three levels of prevention AND occupational health promotion. Our conceptualization of integrative prevention at work reflects this idea by so dedicating its first two attributes. In future work, it might even be interesting to question the wording of the concept of integrative prevention at work, to better reflect the importance of promotion.

Integrative prevention at work: The importance of exchanges between stakeholders

The results of this concept analysis suggest that integrative prevention at work requires exchanges between the stakeholders involved in prevention, whether they come from the health system (i.e., rehabilitation and nursing professionals, physicians), the work environment (i.e., managers, workers, unions, ergonomists, health and safety managers) or the insurance field (i.e., public or private insurer). Indeed, three of the five attributes identified are based on this idea, whether to enable coordination of the three levels of prevention, arrive at a shared understanding of the goal to achieve, or promote stakeholders' engagement. Since the success of integrative prevention depends on such factors as the quality of exchanges between stakeholders, it is important to understand how they function. Recognizing the social exchange theory [64] and its norm of reciprocity [65] as dominant theories regarding social interactions, particularly in relation to work [66, 67], offers relevant resources for understanding the mechanisms that govern exchanges between individuals regarding integrative prevention at work. In social exchange relationships, individuals seek to maintain a balance between their investments (e.g., effort expended) and the benefits they receive (e.g., recognition). Social exchange theory predicts how an action or behavior initiated toward an individual (e.g., consideration of a preventionist's advice in implementing a work-life balance program by the human resources department), which may be positive or negative, may prompt another action, positive or negative, by that individual (e.g., compliance with human resources issues in the return-to-work plan the rehabilitation professional implements). Based on this premise, a stakeholder would put a more concerted effort into integrative prevention actions at work if the other stakeholders also made such efforts, and vice versa. Social exchange implies a desire for reciprocity, which creates an incentive to establish a balance between actors. This desire for reciprocity serves

as a catalyst for social interactions. Such reciprocal exchanges may involve various resources, attitudes, and behaviors, including respect, safety, or support [68].

On a practical level, authors have previously suggested the important role that occupational rehabilitation professionals can play in promoting positive social exchanges between stakeholders [69]. Indeed, since occupational rehabilitation professionals have to interact with all stakeholders, from the health care system to the work environment to the insurance industry, they are well positioned to encourage these exchanges. For example, by being involved with the worker-employer-insurer triads during the return-to-work process, professionals could, on the one hand, ensure that workers receive the organisational support required to invest in their work while preserving health, safety, and well-being. On the other hand, rehabilitation professionals could support insurers and employers in the implementation of accommodations or in the modification of measure or operating protocols, favoring their openness to the worker's needs. Since occupational rehabilitation professionals can intervene both with the worker and their environment, they are the professionals of choice to invite the stakeholders to simultaneously involve themselves regarding prevention, to put in place the conditions conducive to a successful social exchange process.

Social exchange theory has figured in documenting workplace interactions regarding various factors, including mental health in the workplace [70], occupational health and safety [71], and job retention after a period of disability [69]. Further research may be relevant to exploring its use in integrative prevention at work. Since authors suggest that the organization of prevention activities in silos [28] and stakeholders' inertia [45] are obstacles to the implementation of integrative prevention in the workplace, this avenue seems even more relevant.

Strengths and limitations

The methodology used to carry out this concept analysis enabled consulting manuscripts from a variety of fields in the literature, a strength for developing a unified and unifying conceptualization of integrative prevention at work. In addition, the methodology is rigorous and reproducible, and the results enable identifying concrete avenues for guiding stakeholders, including occupational rehabilitation professionals, in the implementation of integrative prevention at work. However, in accordance with the concept analysis specifications, the quality of the selected manuscripts was not evaluated. In addition, other methods of concept analysis exist, and the use of another method might have led to different results. As we aimed to identify the shared variables of the concept across the various disciplines, results may lack specificity or nuance about the distinct approaches of integrative prevention. Readers are invited to read the selected manuscript for more details. Finally, the proposed definition of integrative prevention can be formulated with today's knowledge. Therefore, considering that concepts evolve over time, it is possible that this definition will change.

Conclusion

This study has proposed an operational conceptualization of integrative prevention at work, identifying its attributes, antecedents, consequences, and the constant influence of context of a change process. In addition to the attributes, these results highlight the importance of the antecedents for the implementation of integrative prevention. The consequences are still insufficiently documented, given the emergence of the concept. However, the results of the study show the important benefits that the implementation of integrative prevention in the

workplace can have, both economically and for workers' health. One of the next steps in the advancement of knowledge of this concept would be to develop a tool that would enable measuring the presence of attributes, antecedents, and consequences, to inform the presence of integrative prevention in different environments. Such a tool could be used to guide occupational rehabilitation professionals in their practice.

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Ethical Considerations

Ethics approval was not required for the review of previously published scientific literature. No animal or human studies were carried out by the authors for this article.

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Conflict of interest

None of the authors has any conflict of interest to declare.

Data availability

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

Authors' contributions

All authors contributed to the study conception and design. Material preparation, data collection and analysis were performed by AL, revised by MEM, VL, CV and MEL. The first draft of the manuscript was written by AL and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

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