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Bridging the Gap Between Rehabilitation and Return to Work: A Qualitative Evaluation of a Workplace Intervention for Low Back Pain

Lisa Bernaers[1,2] · Tine Marieke Willems[1] · Dorina Rusu[3] · Christophe Demoulin[3,4] · Dominique Van de Velde[1] · Lutgart Braeckman[2]

[1] *Department of Rehabilitation Sciences, Faculty of Medicine and Health Sciences, Ghent University, Campus Heymans (UZ) 3B3, Corneel Heymanslaan 10, 9000 Ghent, Belgium*
[2] *Department of Public Health and Primary Care, Faculty of Medicine and Health Sciences, Ghent University, Campus Heymans (UZ) 4K3, Corneel Heymanslaan 10, 9000 Ghent, Belgium*
[3] *Department of Public Health Sciences, Faculty of Medicine, Quartier Hôpital, University of Liège, Avenue Hippocrate 13, 4000 Liège 1, Belgium*
[4] *Department of Physical Activity and Rehabilitation Sciences, University of Liège, ISEPK B21, Sart-Tilman, 4000 Liège, Belgium*

Abstract

Background Low back pain (LBP) can lead to disability and sick leave, impacting work participation and overall health. Given the complex and multifactorial nature of LBP, Belgium's Federal Agency for Occupational Risks (FEDRIS) promotes a secondary prevention strategy for LBP among workers engaged in ergonomically demanding tasks. This strategy includes multidisciplinary-based rehabilitation and an optional workplace intervention (WPI), initiated upon employer request. The WPI component consists of a half-day ergonomic risk analysis at the workplace conducted by an external occupational health service. This paper is one of two parallel qualitative studies that explored the experiences and perspectives of employees and healthcare professionals (HCPs) on the secondary prevention program. The current study focuses on the optional WPI, aiming to identify its strengths, challenges, and potential solutions.

Methods Between April 2022 and April 2023, six multicenter semistructured focus groups were held with 15 employees (2015–2019 program participants) and 24 HCPs (including external ergonomists) recruited from 11 Belgian rehabilitation centers and hospitals. Sessions were organized as employee-only, HCP-only, or mixed groups. All the interviews were anonymized, transcribed verbatim, and analyzed inductively via thematic analysis, with validation through data triangulation, intercoder checks, and participant feedback.

Results The analysis reveals strengths, challenges, and solutions associated with the WPI before, during, and after implementation. Before the intervention, some HCPs recognized the WPIs' benefits, but limited awareness, employer hesitancy, practicality concerns, and job security fears presumably contributed to low application rates. The proposed solutions include proactive communication, streamlined processes, and enhanced employer engagement. During implementation, strengths included improved employee engagement and interdisciplinary collaboration, but challenges related to limited integration and timing affected effectiveness. Early ergonomic assessments and better communication are suggested. After the intervention, inconsistent feedback hindered sustainability, highlighting the need for systematic follow-up and stronger organizational commitment.

Conclusions The WPI provides some tangible benefits for sustainable return to work in Belgium's secondary prevention strategy for LBP, yet a few gaps remain. Low employer awareness, application hesitancy, and inconsistent follow-up hinder effective implementation. Equally, interdisciplinary collaboration and proactive ergonomic assessments are considered

strengths of the WPI. Involving all key stakeholders emerges as critical for addressing practical concerns and ensuring ongoing support. Future refinements should prioritize streamlined processes, early-stage interventions, and consistent feedback.

Keywords Low back pain · Return to work · Vocational rehabilitation · Ergonomic intervention · Qualitative research · Focus groups · Secondary prevention

Abbreviations

LBP	Low back pain
FEDRIS	Federal Agency for Occupational Risks
WPI	Workplace intervention
HCPs	Healthcare professionals
RTW	Return to work
MBR	Multidisciplinary-based rehabilitation
NIHDI	National Institute for Health and Disability Insurance
OHS	Occupational health service
OP	Occupational physician
RP	Rehabilitation physician

Background

Low back pain (LBP) is a significant global health challenge characterized by a high prevalence and profound impact on individuals and economies [1–4]. As the leading cause of years lived with disability worldwide, LBP severely impairs physical functionality and psychosocial well-being [4–10]. It is the most common cause of medically certified sick leave and early retirement in Europe [11] and accounts for more lost workdays than any other musculoskeletal condition in the United States [12]. In Belgium, LBP accounts for 13.1% of the national disease burden, resulting in substantial economic costs, with annual expenses estimated at €3,269 per patient in direct costs and €6,557 in indirect costs [13, 14]. Additionally, LBP impacts the workforce, contributing to 11.9% of longterm sick leave in Belgium and posing a risk of prolonged work absence for nearly 5% of workers [15]. The majority of LBP cases are classified as nonspecific, complicating effective management and underscoring the need for multifaceted approaches that address its biopsychosocial dimensions [1, 16–18].

Occupational factors such as manual handling, prolonged postures, vibrations, and workplace stress contribute to LBP and can impede return to work (RTW) [4, 19–27]. RTW, a complex process influenced by physical, psychological, and social factors, is vital for socioeconomic stability and well-being [28–31]. Workplace accommodations and targeted rehabilitation, especially for physically demanding jobs, are crucial for facilitating RTW [32].

Both national and international guidelines advocate for a biopsychosocial approach to LBP management, promoting multidisciplinary-based rehabilitation (MBR) programs that combine clinical care with workplace interventions (WPIs) [33–39]. Research indicates that early, coordinated MBR programs can reduce disability and improve RTW rates, although there remains room for improvement in work-related outcomes [20, 32, 39–42]. A recent review highlighted three core domains in occupational rehabilitation: health interventions (such as exercise, cognitive–behavioral therapy, and work hardening), health services coordination (including workplace–healthcare communication), and work modification (such as ergonomic adjustments and flexible duties) [41]. Interventions that involve at least two of these domains are associated with decreased work absence for individuals with chronic musculoskeletal pain [41]. Furthermore, research indicates that blue-collar workers, who are more susceptible to musculoskeletal issues, often face challenges accessing or adhering to WPIs, leading to less effective outcomes compared to white-collar workers [39, 43–46].

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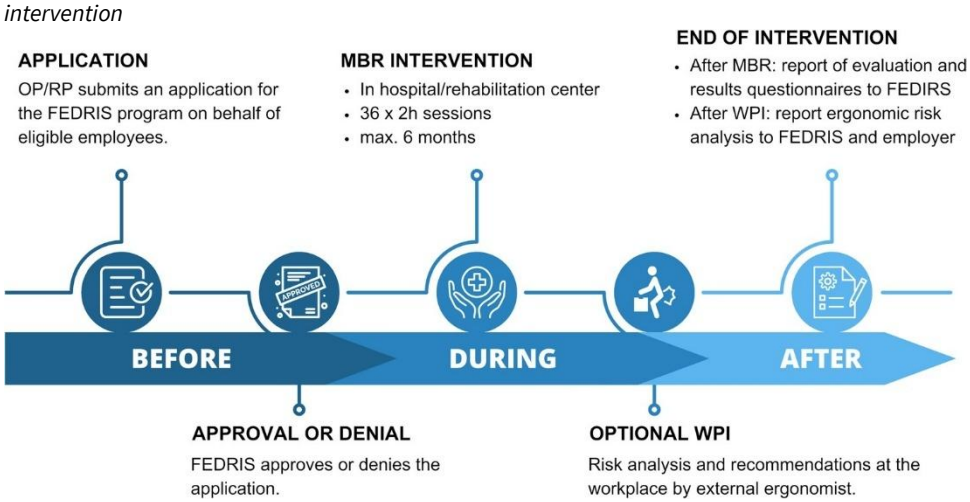
The FEDRIS Secondary Prevention Program

To address the impact of LBP on the Belgian workforce, the Federal Agency for Occupational Risks (FEDRIS) has launched a secondary prevention strategy targeting employees in ergonomically demanding jobs [47]. This initiative is based on the Sherbrooke Model [48] and is jointly funded by FEDRIS and the National Institute for Health and Disability Insurance (NIHDI). The program offers a 36-session MBR program, which includes an optional WPI initiated upon employer request [47, 49]. The program's broader objectives include preventing the progression of LBP, promoting RTW, and fostering collaboration between curative and preventive services. All aspects of the FEDRIS secondary prevention strategy are visually represented in Fig. 1.

The WPI component consists of a half-day workplace risk assessment and ergonomic review conducted by an external occupational health service (OHS). It provides tailored recommendations, such as ergonomic training, handling techniques, and equipment modifications designed to align job demands with workers' physical capabilities. Initially, employers cover the costs of the external OHS, which FEDRIS subsequently reimburses at a fixed rate. Although combining MBR with a WPI is considered optimal for sustainable RTW after LBP [40, 50], only one-third of the eligible employees in Belgium opt to use the WPI (FEDRIS, written communication), prompting FEDRIS to investigate both the challenges underlying its low uptake and the experiences of those involved.

Fig. 1. *Enrollment, interventions, and assessments within the FEDRIS program. OP occupational physician, RP rehabilitation physician, FEDRIS Federal Agency for Occupational Risks, MBR multidisciplinary-based rehabilitation, WPI workplace intervention*



Objectives

This study is part of a larger research project evaluating the FEDRIS secondary prevention strategy for LBP. A separate study [51], published elsewhere, examines experiences and perspectives on the MBR component. The present article specifically focuses on the WPI component, aiming to identify its strengths, challenges, and areas for improvement. These findings may help further optimize its impact.

Methods

Study Design and Setting

The study was designed as a multicenter qualitative study using semistructured focus group interviews. A qualitative approach was chosen to gain in-depth insights into personal and professional experiences with the WPI, which could not be captured through quantitative measures alone. Ethical approval was obtained from the Independent Ethical Committee of Ghent University Hospital (Ref BC-10945). All participants provided written informed consent before participation. This study adheres to the Consolidated Criteria for Reporting Qualitative Research (COREQ) [52], with a completed checklist provided in Supplementary File 1.

Participants

The two parallel qualitative studies, including this study on the WPI, used the same sample, which included employees eligible for FEDRIS reimbursement who participated in the secondary prevention program between 2015 and 2019 ([47]; Table 1), as well as the involved healthcare professionals (HCPs). Employees were selected via a maximum variation sampling approach [52], whereas HCPs were recruited via criterion sampling. The criterion sampling strategy encompassed three subgroups: HCPs actively involved in the MBR program—such as specialists in physical medicine and rehabilitation, physiotherapists, occupational therapists, and psychologists; occupational physicians who had referred employees to the program; and external ergonomic prevention advisors experienced in implementing the WPI. Nonresponders were recontacted after one month.

Data Collection

To maintain consistency and minimize potential bias, the interviewers followed a preapproved semistructured interview guide (see Supplementary File 2). This guide was developed by the research team in consultation with an expert panel involved in the development of the FEDRIS program and various HCPs. The open-ended questions were designed to explore key discussion topics, including the WPIs' strengths, challenges, and possible areas for improvement. The guide was pilot tested, with iterative refinements based on feedback from the Department of Rehabilitation Sciences.

The data were collected through six focus group interviews held between April 2022 and April 2023. The focus groups were divided into three types: two employee-only groups, two HCP-only groups, and two mixed groups (including both employees and HCPs). Each group type included one Dutch-speaking group and one French-speaking group. The employee-only groups aimed to foster solidarity among participants, whereas the HCP-only groups facilitated interdisciplinary dialog among professionals. The mixed groups promoted interaction between employees and HCPs, with no direct relationships between participants, encouraging candid discussions. For clarity, all focus group participants are referred to collectively as "participants" in the findings.

The Dutch-speaking groups were conducted at Ghent University Hospital, facilitated by LBe (female, PhD student, physiotherapist), with GHL (female, student in occupational medicine) as the observer. The French-speaking groups were held in Namur and Hainaut, led by DR (female, professor in occupational medicine), with MM (female, student in occupational medicine), and/or CD (male, professor, and physiotherapist) as observers. The interviewers, all with professional backgrounds in healthcare (physiotherapy and occupational medicine), had no prior contact with the participants. To minimize bias, the interviewers were mindful of their professional backgrounds and potential biases, maintaining neutrality in facilitating discussions.

Before the interviews, the participants completed a brief demographic survey, received detailed information about the study's procedures, and provided written informed consent. The interviews, which lasted between 1 h 18 min and 2 h, were anonymized, securely stored, and transcribed verbatim from field notes, audio, and video recordings. French transcripts were translated into Dutch, with cross-referencing by MM to ensure translation accuracy.

Rather than strictly adhering to a data saturation model, the study followed a pragmatic approach, aiming to gather sufficient data to address the research questions [53]. After the final focus group, few new insights emerged, suggesting that the data collection adequately met the research objectives.

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Data Analysis

NVivo v.1.7 software was used to manage and organize the qualitative data throughout the analysis. The analysis followed Braun and Clarke's six-step thematic analysis method [54, 55], which uses an inductive, semantic, and realist approach to remain close to the data. This allowed codes to be identified directly from the data without the constraints of a preexisting coding frame, with the assumption that participants' responses reflected their lived realities. The goal was to produce actionable insights by combining the personal experiences of employees and HCPs [56]. Themes were generated from the surface meaning of participants' responses, with reflection on their broader significance during the discussion phase.

Table 1. *Eligibility criteria for applying for the secondary prevention program with reimbursement from FEDRIS*

Employment sector	Private sector or provincial or local government agency
Health supervision	Occupational physician
Exposure	Back-straining work: ergonomic strain, lifting loads, or mechanical vibratio the seat
Pathology	1. Nonspecific LBP with or without sciatica 2. Lower back surgery
Duration of work disability	At least four weeks and no longer than six months *If the duration does not meet the criteria, an employee who has been incapacitated for week can apply if the total duration of work disability due to LBP amounts to at least fo the year preceding the application*

FEDRIS Federal agency for occupational risks, *LBP* low back pain

To ensure familiarization with the data, three authors (LBe, GHL, and MM) independently read the transcripts, keeping the research questions in mind. Each generated an initial set of codes, which were then compared in subsequent meetings. High qualitative intercoder agreement was observed, and any discrepancies were resolved through discussion.
LBe collated the codes into potential themes, working iteratively with all coauthors to refine these themes through multiple meetings. Regular cross-referencing of the coded data with the original transcripts ensured fidelity to participants' responses. Analyst triangulation was conducted, with all the authors—including the experts not involved in the initial coding—contributing to the final definition of the themes. A coding tree providing all the categorized codes and the formation of the main themes in the results can be found in Supplementary File 3.

Results

The study ultimately included 39 participants—24 HCPs (including three external ergonomists) and 15 employees. Among the HCPs, there were eight males and 16 females aged 27–51 years, whereas the employee group included six males and nine females aged 41–69 years. The HCPs had an average of 15 years of professional experience, with a minimum of five years. The participant characteristics are summarized in Table 2.
The analysis identified several strengths, challenges, and potential solutions. To enhance clarity, the results are organized on the basis of their timing in relation to the WPI: aspects occurring before, during, or after the intervention. The specific aspects of this timeline are visualized in Fig. 1. Additional quotes and more in-depth conversations illustrating the themes are provided in Supplementary File 4.

Strengths, Challenges, and Solutions Before the WPI

Challenges from the timeframe 'before the WPI' were primarily a reflection of the low application rates. These challenges can be categorized into four main subthemes: *lack of awareness and encouragement*, *employer hesitancy*, the *applicability of the WPI, and concerns about job security*.

Lack of Awareness and Encouragement

Although some knowledge of the WPI existed, a key challenge identified by the participants was *insufficient awareness among stakeholders—employers, employees, and HCPs*—regarding the benefits and procedures of the WPI. This lack of awareness contributed to underutilization and dissatisfaction with the program. This was reflected in the study sample, where only two of the 15 participants benefited from the WPI.

Employees generally reported limited knowledge of the ergonomic intervention. Only one employee mentioned receiving the intervention automatically. In contrast, others either did not know about it, had only heard about it informally, or faced challenges in accessing it despite requesting it. This lack of information left employees disappointed.

"No, no, I didn't know about it. It's now that I'm hearing about it for the first time." (Employee 6)

HCPs within rehabilitation centers recommend raising awareness of the WPIs within the hospitals/rehabilitation centers where the MBR program is given, increasing the number of applications through rehabilitation physicians, and streamlining the application process to increase efficiency. Direct contact between centers and OHS is considered to expedite interventions. There is consensus on the centers' role in informing patients about the WPI or general adaptations, even without FEDRIS involvement.

"The occupational physicians' signature is still required [for the application] if we were to drop that step so that the rehabilitation physician can register immediately." (HCP 24)

"Perhaps we're not fully utilizing workplace adjustments in companies. I think this is undoubtedly underused, and that is a shame." (HCP 13)

Table 2 Sociodemographic data of the participants (n = 39)

	HCPs		Employees		Mixed group	
	Dutch	French	Dutch	French	Dutch	French
Amount (n)	(n = 5)	(n = 12)	(n = 8)	(n = 4)	(n = 4)	(n = 6)
Mean age (min–max)	39.4 (31–58)	45.5 (27–60)	56.5 (51–69)	55.8 (47–66)	47.3 (46–49)	47.2 (35–55)
Gender	F = 2; M = 3	F = 9; M = 3	F = 5; M = 3	F = 2; M = 2	F = 2; M = 2	F = 5; M = 1
Occupations HCPs MPR	3	3				
Occupational physician	2	4				1
Occupational therapist		1				1
Physiotherapist		3			1	1
Psychologist		1				
External prevention adviser					3	
HCPs mean years of experience (min–max)	13 (5–31)	20 (5–30)	–	–	9.5 (7–10)	19 (5–30)
Occupations employees			5			1
Nurse (or nursing assistant)						

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Handyperson		1	
Laborer		1	
Clerk		1	
Early childhood assistant			1
Firefighter			1
Technician			1
Family aide			1
Caregiver			1
Driver—Delivery			1

HCP healthcare professional, *n* number, *min* minimum, *max* maximum, *F* female, *M* male, *MPR* physical medicine and rehabilitation physician

Employer Hesitancy

HCPs highlighted the critical role that employers play in the WPI application process. Although larger organizations demonstrate positive employer and employee support, many employers remain unaware of essential details, such as swift financial reimbursements and the advantages of having external ergonomists onsite. Concerns about workplace disruptions and the mistrust of external specialists further hinder application rates. They see that employers often approach interventions with a cost–benefit mindset, focusing on absenteeism reduction and investment returns.

"It is not the employee who decides that [to accept the optional WPI], right? It is the employer who has to say, 'Yes, it is fine, come on over.'" (HCP 3)

HCPs suggested solutions, such as emphasizing that initial changes could be minor and inexpensive, with larger adjustments addressed over time. Direct payments from FEDRIS to external OHSs were also proposed to streamline financial processes and mitigate employer hesitancy. *"Employers are concerned about paying upfront and then possibly getting reimbursed. Especially smaller businesses (in crisis) are wary." (HCP 21)*

Additionally, HCPs believe that occupational physicians (OPs) and external OHSs play pivotal roles in coordinating and advocating for workplace visits. However, variability in engagement was noted, with some physicians actively promoting the intervention while others deprioritized it owing to time constraints.

"I'm quite sure that if we look at the percentage of requests that are actually implemented, the reason they're not might lie with us [OPs] because we do not have the time or prioritize them." (HCP 3)- "I'm not sure about that, I would not dare say..." (HCP 1)

Some HCPs propose that OPs should solely determine employee eligibility for WPIs, questioning the necessity of employer involvement in the application process. Others recommend automatic inclusion of the WPI for all employees in the FEDRIS program, with an "opt-out" approach to reduce application burdens and prevent delays or rejections from employers, ensuring more timely interventions. However, there could be a risk that employer disapproval might jeopardize the entire prevention program application. This perspective underscores the need for a more streamlined, efficient process while balancing the interests of all stakeholders involved.

"Actually, that [the WPI application] should be done through the occupational physician, who would say that they need a workplace analysis, they attend back school, okay, have long been suffering from back issues, okay, definitely send the ergonomist there." (HCP 2)

"I think we need to reverse the approach. Currently, as a rehabilitation center, patient/employee, or external service [OHS], you have to convince the employer of its benefits. Instead, it should be like, 'This is part of it because it is a positive translation.' And if you can justify why you do not want it on your workplace floor, then it can be excluded, giving them still some choice."

(HCP 5)

Applicability of the WPI and Concerns About Job Security

The practicality of implementing WPIs varies across different work environments. *Employees* in nontraditional or home-based jobs expressed doubts about the applicability of ergonomic interventions to their roles. For some, the nature of their work made significant modifications seem infeasible:

"For me, it was not applicable because it does not qualify for home nursing." (Employee 5)

"I think I pushed it aside in my head because the reality of the job means it is not possible." (Employee 12)

Furthermore, *HCPs* expressed that their patients sometimes feared that requesting ergonomic assessments could negatively affect their career progression or job security. They recall their patients being worried about potential repercussions, such as being labeled as having a chronic condition or jeopardizing future promotions:

However, many employees still fear "what is my boss going to say... What will my boss think of that if that request suddenly comes?" (HCP 1); Yes, then you literally say to your boss I have back problems (HCP3); Yes, yes, that can prevent a promotion, right? (HCP2).

Strengths, Challenges, and Solutions During the WPI

The study identified three primary subthemes for the timeframe 'during the WPI': *satisfactory outcomes,* the *involvement and collaboration of various stakeholders*, and the *timing and extensiveness of the intervention*.

Satisfactory Outcomes

HCPs observed that WPIs were highly valued when tailored to individual needs. Personalized interventions fostered employee recognition, providing a platform to voice concerns and gain control over their work environment. WPIs also sometimes uncover underlying issues, such as interpersonal conflicts or job dissatisfaction, addressing broader factors contributing to work-related stress and chronic back problems:

"They are better equipped to discuss it... with their employer or supervisor, with colleagues... showing that certain measures are necessary." (HCP 21)

HCPs also noted the importance of direct communication with employers to demonstrate the broader benefits of ergonomic interventions for the entire workforce:

"It is not just about helping or protecting the individual, but about all the people who perform that task being able to benefit from it." (HCP 22)

Involvement and Collaboration of Various Stakeholders

Rehabilitation centers focus on physical recovery through the 36-session MBR program; however, integrating ergonomic principles into workplaces remains challenging. Discussing workplace environments, identifying specific tasks, and addressing obstacles proved difficult. While patients were encouraged to actively identify ergonomic solutions, practical implementation often fell short. HCPs in these centers highlighted their neutral role in supporting professional reintegration and assessing job fitness.

"For the employee, especially for manual workers, it is sometimes very difficult to specify what should I do there? What exactly is so physically demanding? I experience discomfort, but making that translation by themselves is not so obvious." (HCP 21)
"I think, indeed from experience, it varies greatly in terms of what they have already seen and especially applying it in practice. I believe that almost every center talks about what you can do at home in daily life, but the translation to work, I do not hear that from every employee." (HCP 22)

In contrast, *external OHSs*, which offer an onsite ergonomic assessment (the WPI), were deemed more effective at identifying and resolving workplace challenges. Personalized guidance on the work floor helped employees apply ergonomic strategies in a manner tailored to their roles:

"People sometimes work for years with the same posture... The personal approach at that moment is truly valuable." (HCP 1)
"I agree with the 'aha' moment that many people have, seeing things they have been taught but not actually noticing on their work floor. By being there and applying those principles they have learned, it is not just about becoming physically stronger but also about the things they have been taught that they cannot translate on their own." (HCP 21)

Despite their respective contributions, a lack of communication and feedback loops between stakeholders— particularly between rehabilitation centers, OPs, external OHSs, and employers—presents challenges to cohesive intervention planning. Effective communication and a balanced approach to addressing both individual and organizational needs were emphasized by the HCPs. HCPs recommended sharing ergonomic reports across these groups to improve collaboration and outcomes:

"However, we also do not receive any feedback about it, so I think, well, apart from now [in the focus group], I also did not see the immediate added value, because we do not get anything back. We do not know what is actually being done or advised there." (HCP 23)

The potential role of OPs in providing work-related details during the rehabilitation process was proposed, as it could facilitate a more comprehensive understanding of the work environment. Conversely, the integration of patient information from rehabilitation sessions into ergonomic reports by external OHS—while ensuring confidentiality—was recognized as a 'good practice' that supports a holistic recovery approach.

Timing and Extensiveness of the Intervention

The *timing* of WPIs emerged as a critical factor possibly influencing their effectiveness. While early-stage interventions were seen as proactive measures to prevent workplace challenges before an employee's RTW, others emphasized the importance of aligning interventions with later stages of recovery to ensure the practical application of learned principles. This debate highlighted the complexity of determining optimal timing:

"An intervention can come earlier in the process; it does not have to be at the end of the line. On the other hand... the added value is mainly in making that translation, so more toward the end." (HCP 24) "However, making that translation from what's learned to practical application... I think we, as external prevention advisors or internal specialists, can already be there earlier with that analysis. It is not just about teaching people how to move and behave to avoid discomfort; we can also anticipate more about whether the job will still be feasible and whether adjustments are needed, specifically for that person but also for other colleagues. In addition, that can be a much better preparation for returning to work, I believe." (HCP 21)

Delays in initiating WPIs due to scheduling difficulties were reported. For example, by the time interventions were arranged, rehabilitation programs were often nearing completion, limiting the opportunity for targeted workplace adjustments. HCPs also advocated for *longer and more comprehensive interventions* to allow for deeper integration of ergonomic principles into workplace settings. Practical coaching on the work floor, aligned with employees' recuperation periods, was viewed as essential for achieving sustainable outcomes.

Strengths, Challenges, and Solutions After the WPI

The participants identified several challenges and solutions for the timeframe 'after the WPI,' particularly in feedback and follow-up mechanisms, which are critical for sustaining the effectiveness of the WPIs.

Feedback and Follow-up Mechanisms

A lack of consistent feedback and follow-up emerged as a significant challenge, creating a disconnect between ergonomic recommendations and their implementation. Employees expressed frustration when workplace adjustments, such as lifting restrictions or customized furniture, were not acknowledged or acted upon by their supervisors. This disconnection often left workplace issues unresolved:

"They came a few times to make suggestions... and then I think to myself, you're just wasting your time here because it will not be adjusted anyway." (Employee 2)

Both HCPs and employees highlighted the absence of employer feedback on the impact and implementation of WPIs. This gap has hindered the evaluation of intervention effectiveness and limited opportunities to identify areas for improvement. HCPs noted that busy schedules and multiple client commitments often restrict external ergonomists' ability to provide adequate follow-up:

"If you expect that follow-up to also happen, it is actually not possible in the current situation. Therefore, if you want to pursue this more, which will increase the effect, it seems to me that an expansion is necessary." (HCP 22)

OPs were recognized as key stakeholders in coordinating follow-up efforts and guiding the RTW process. Their expertise in workplace health and risk assessment enabled them to provide valuable insights into both personal and work-related factors influencing employee reintegration.

Discussion

Main Findings

This qualitative study investigated the experiences and perspectives of the optional WPI within the secondary LBP prevention strategy from FEDRIS. The analysis identified strengths, key challenges, and proposed solutions, with the results structured according to their timing relative to the intervention: before, during, or after the WPI. The discussion explores and builds on these challenges and proposed solutions, drawing on the study's findings, the authors' insights and interpretations, and supporting the literature [50, 57–95]. An overview of the strengths, challenges, and solutions bundled from the discussion can be found in Figs. 2, 3, and 4.

Before the Intervention: Addressing Awareness and Implementation Challenges

Significant challenges, including low application rates, limited awareness, employer hesitancy, and concerns about feasibility and job security, appeared within the timeframe before the WPI, underscoring the need for targeted awareness campaigns and improved implementation strategies.

A primary barrier was the *lack of awareness among employers, employees, and HCPs*. Inconsistent communication, limited engagement, and time constraints contributed to this gap, echoing the literature emphasizing the importance of clear, relatable information to promote the understanding and uptake of interventions [57, 58]. HCPs suggested that rehabilitation centers, OHSs, and OPs should take a more active role in promoting WPIs during rehabilitation. *Employer hesitancy* stemmed from concerns about financial and operational disruptions, particularly in smaller companies. The literature supports the need for effective communication and streamlined financial processes to reassure employers and promote participation [59–64]. Highlighting long-term benefits, such as reduced absenteeism and improved productivity, may also enhance employer engagement. *Simplifying the WPI application process*, such as allowing OPs to determine eligibility or adopting an opt-out system, could increase accessibility. This approach aligns with the work-related nature of LBP and related conditions, minimizing delays and ensuring timely interventions. However, workplace culture and managerial support are critical for successful implementation [65, 66]. Additionally, interventions should be *tailored to diverse work environments*, including remote and nontraditional settings, to enhance relevance and acceptance. *Fear of workplace discrimination and job insecurity*, particularly among older workers, further deterred participation. These findings align with research showing that older employees often face stigma and reduced support during RTW processes

[67–71]. Confidential application processes and managerial training in inclusive practices can address these concerns, fostering engagement and psychosocial well-being [63, 72–74].

During the Intervention: Addressing Stakeholder Collaboration and Timing Challenges

WPIs empower employees by addressing workplace issues such as interpersonal conflicts and job dissatisfaction and improving well-being and RTW outcomes [59, 61, 75–79]. However, recent reviews indicate that ergonomic-focused interventions offer limited benefits in physically demanding work environments compared with strength training [80], contrasting findings in more sedentary populations. This discrepancy highlights the need for further research to optimize WPIs in combination with multidisciplinary rehabilitation programs.

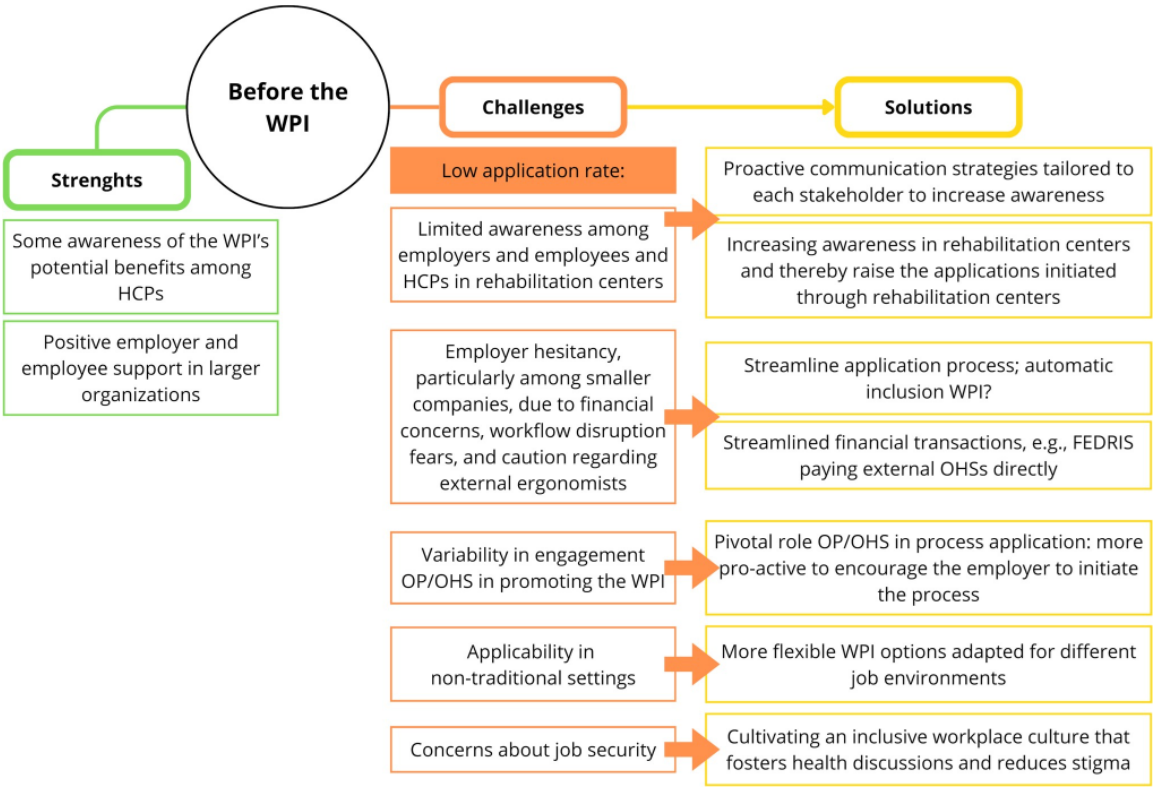
Employer involvement in assessment and participatory approaches that engage workers in intervention design can improve outcomes and promote ownership [57, 81, 82]. Furthermore, structural changes, rather than solely focusing on individual interventions, are essential for sustainable outcomes [83]. Successful models, such as the Dutch Multidisciplinary Outpatient Care (MOC) program, integrate participatory ergonomics with cognitive–behavioral principles, addressing both individual behaviors and organizational systems [63, 84]. Expanding WPI programs to include practical coaching alongside theoretical training could further increase their effectiveness. However, challenges in implementing broader ergonomic interventions, including administrative burdens and limited uptake, underscore the need to balance complexity with feasibility.

Organizational cultures emphasizing rigid production standards, hierarchical attitudes, and inflexible work practices often hinder adoption, emphasizing the importance of adaptable and supportive workplace environments [57].

Coordination among rehabilitation centers, OHSs, and OPs is vital for addressing workplace-specific challenges. Personalized interventions tailored to manual workers can improve productivity and job satisfaction [73]. Effective strategies include flexible work hours, involving employees in decision-making, task rotation, ergonomic education, adapted techniques and equipment, and gradual work reintroduction [73]. Addressing psychosocial and organizational challenges is essential for maximizing WPI benefits [85]. The literature highlights that integrated actions and enhanced cooperation among stakeholders are essential for improving RTW outcomes [86–90]. However, the lack of feedback loops between OPs, rehabilitation centers, and OHSs in this WPI remains a significant barrier to successful intervention.

The timing of WPIs is critical for success. Early interventions aligned with recovery and RTW timelines can proactively address workplace challenges [91–94]. However, delays in approval processes, such as those in FEDRIS, hinder timely implementation. Streamlining these processes could ensure that interventions align with recovery stages, enhancing their impact. In addition, determining the optimal timing requires flexibility, as the ideal moment may vary depending on an individual's recovery progress or specific workplace demands [50, 95].

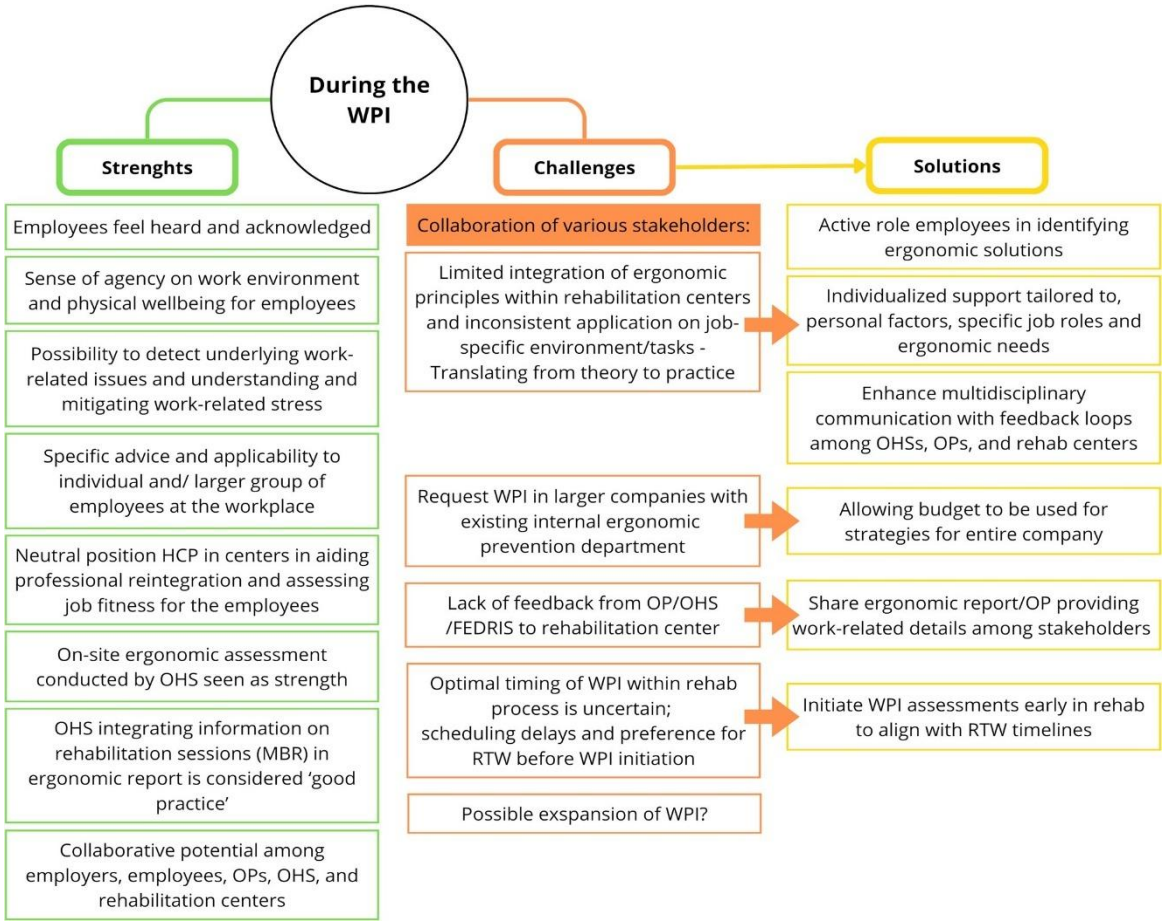
Fig. 2 Strengths, challenges, and possible solutions 'before the WPI'. *WPI* workplace intervention, *HCP* healthcare professional, *OP* occupational physician, *OHS* occupational health service, *FEDRIS* Federal Agency for Occupational Risks



After the Intervention: Addressing Effective Follow-up

A *lack of follow-up mechanisms* frequently frustrates employees, particularly when ergonomic recommendations are disregarded or inadequately implemented. This finding is consistent with findings in qualitative studies indicating that professional advice is often poorly implemented due to time constraints and competing responsibilities among HCPs and OHSs [65]. Establishing robust feedback mechanisms is essential. Regular evaluations and structured follow-up assessments can monitor the implementation and impact of interventions. Consistent communication among employees, employers, OPs, and HCPs can address ongoing challenges and improve outcomes. OPs play a critical role in bridging this gap by coordinating follow-up efforts and integrating ergonomic adjustments into workplace practices. While proactive systems are vital for protecting workers, preventing injuries, and promoting well-being, research has insufficiently explored the barriers to implementing occupational health recommendations [65]. Allocating additional resources and streamlining processes may further enhance the sustainability of follow-up activities.

Fig. 3 Strengths, challenges and possible solutions 'during the WPI'. *HCP* healthcare professional, *OHS* occupational health service, *MBR* multidisciplinary-based rehabilitation, *OP* occupational physician, *WPI* workplace intervention



Methodological Considerations

This study has several methodological limitations that warrant consideration. First, the voluntary nature of participation introduces a large risk of selection and recall bias, potentially excluding relevant perspectives. Although the sample was diverse in terms of language (Dutch- and French-speaking regions), rehabilitation centers, and occupational backgrounds, certain groups—such as OPs, rehabilitation physicians, and physiotherapists—were overrepresented. While this reflects the actual composition of the HCPs involved in the program, it may have limited the range of viewpoints. Additionally, the limited participation of employees—due to the relatively small number who had fully engaged with the WPI—may have restricted insights into their experiences. Broadening participation to include a more representative group of employees would strengthen the robustness of the findings.

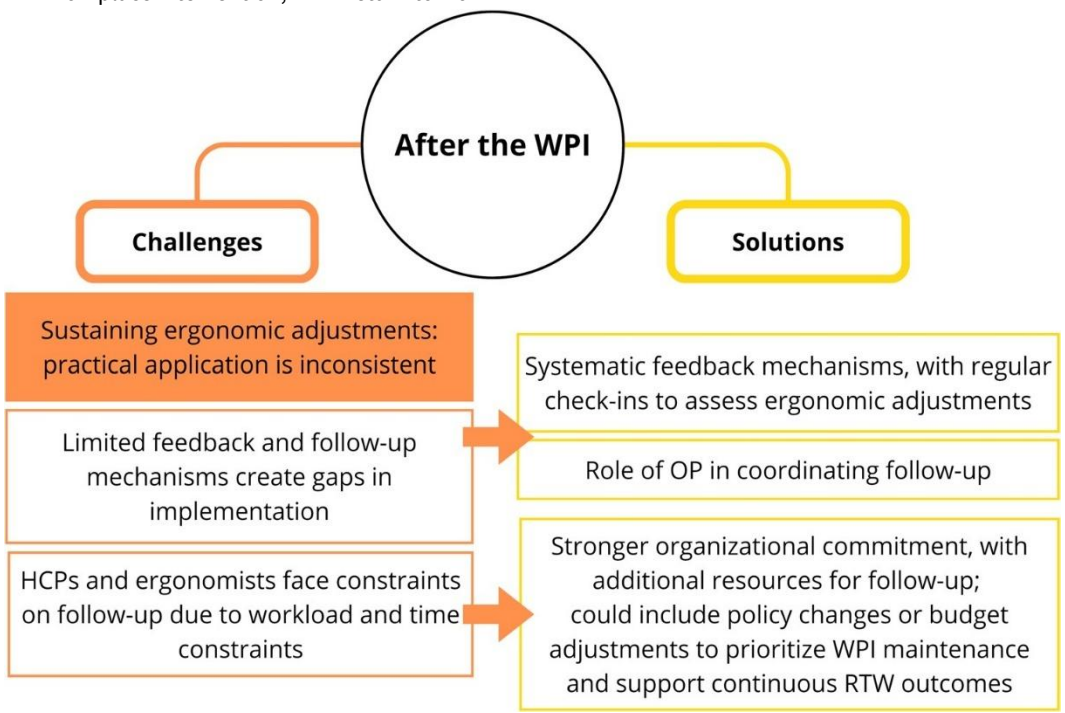
To enhance methodological rigor, multiple strategies were employed, including data triangulation, intercoder reliability checks, and continuous discussions among the research team. Triangulation was conducted across participant types (employees and HCPs) and data collection methods (focus groups, field notes, and demographic surveys), ensuring robustness in the analysis. Thematic analysis was validated by three primary coders (LBe, GHL, and MM) and by qualitative research experts familiar with the FEDRIS program (DdDV, LBr, CD, DR), enhancing the credibility of the findings. Additionally, participant feedback was solicited after the initial themes were formed to ensure accurate interpretation [57]. A data-driven strategy was chosen over reflexive thematic analysis to remain as close as possible to participants' lived experiences and minimize the influence of preexisting knowledge [54]. While this preserved the authenticity of the participants' perspectives, it may have constrained deeper theoretical exploration. The interdisciplinary research team contributed to a richer analysis but may have introduced variability in interpretation. Furthermore, while information on participants' prior rehabilitation experiences and pain history could have provided additional context, these data were not collected in detail because of privacy considerations (GDPR) and the limited number of participants. Although the selection

criteria ensured baseline uniformity, more detailed background data could have yielded nuanced insights into how personal and clinical histories influence program outcomes.

While this study adopted an inductive approach, applying a structured implementation framework such as the Consolidated Framework for Implementation Research (CFIR; [96]; https://c firguide.o rg /) could have provided a more systematic lens for analyzing emergent themes. Although the implementation phase of this intervention has concluded, future research may benefit from CFIR to identify key contextual factors and develop more sustainable implementation strategies.

Importantly, statistical generalizability is not the aim of qualitative research [97]. Instead, this study provides rich, contextually grounded insights into the strengths and challenges of the WPI, allowing readers to assess its relevance and applicability in other settings or similar interventions.

Fig. 4 Strengths, challenges and possible solutions ‘‘after the WPI’. HCP healthcare professional, OP occupational physician, WPI workplace intervention, RTW return to work



Conclusion

This study provides the experiences and perspectives of both employees and HCPs regarding the WPI component within FEDRIS’s secondary prevention strategy for LBP. The capture of input from both groups highlights how their distinct yet complementary viewpoints contribute to a more comprehensive understanding of the intervention.

Key issues raised by employees primarily include limited awareness and accessibility of the program. HCPs, on the other hand, emphasized the need for stronger stakeholder collaboration and better integration of workplace adjustments within broader rehabilitation efforts. Both groups recognized the lack of structured follow-up mechanisms as a major barrier to sustaining long-term workplace improvements. Enhancing outreach efforts, simplifying application procedures, and improving employer engagement could increase participation. Strengthening coordination among rehabilitation centers, OHSs, and OPs, alongside structural changes, may improve intervention effectiveness. Additionally, systematic follow-up mechanisms are crucial to maintaining workplace adjustments over time.

By incorporating diverse perspectives, this research contributes to broader evaluations of the FEDRIS program, offering actionable recommendations to enhance RTW processes. Future studies should focus on optimizing WPI implementation, assessing long-term effectiveness, and conducting economic evaluations to ensure cost efficiency. These efforts will further inform evidence-based policies and improve occupational health strategies for managing work-related LBP.

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Author Contributions All the authors contributed to the study conception and design. LBe, DR, and CD collected the data. LBe, as the first author, performed the initial data analysis. LBe developed the first draft of the manuscript. DVdV, a health researcher with extensive experience in qualitative research, mentored LBe through the analysis and write-up of this project. All the authors contributed to the interpretation of the results and critical revision of the manuscript for important intellectual content. All the authors have read and approved the final manuscript.

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Data Availability No datasets were generated or analyzed during the current study.

Declarations

Conflict of interest The authors declare no competing interests.

Ethical Approval All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2000. The independent Ethical Committee of the Ghent University Hospital granted approval on the 28th of February 2022 (Reference Number BC-10945). Informed consent was obtained from all included participants.
Consent for Publication Not applicable.

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