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Original Research

Integrating interventions based on cognitive behavioural therapy for insomnia in physical therapist practice for individuals with chronic pain and insomnia: Identifying barriers and formulating implementation strategies

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ABSTRACT

Introduction: Cognitive Behavioural Therapy for Insomnia (CBT-I) is the first-choice treatment for insomnia disorders. Although CBT-I is primarily provided by trained psychologists, evidence shows that other healthcare providers can also successfully apply interventions based on CBT-I principles in absence of complex psychiatric comorbidities. Because insomnia and chronic pain often co-occur, integrating CBT-I-based interventions into physical therapy is relevant.

Objectives: To identify implementation barriers for CBT-I in physical therapist practice and to formulate implementation strategies to address them.

Methods: 16 stakeholders (8 physical therapists, 3 psychologists, 2 general practitioners, and 3 individuals with chronic pain and insomnia) were invited for 3 group-interviews and 1 online questionnaire. Implementation barriers were identified through thematic analysis according to the Consolidated Framework for Implementation Research (CFIR). Implementation strategies were matched to barriers and ranked based on evidence and stakeholder feedback.

Results: 33 implementation barriers were identified across all CFIR domains, and 13 final strategies were formulated to address these barriers. Key strategies included education and training for physical therapists, structural changes, and raising awareness among general practitioners and the public. Secondary strategies focussed on adaptability of CBT-I, developing supporting tools, and multidisciplinary collaboration.

Running title: Implementing sleep interventions in physical therapist practice for pain and insomnia

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Conclusion: To overcome barriers for the implementation of CBT-I-based interventions in physical therapy practice, it is important to involve educational institutions, research bodies, policymakers, and patient representatives in crafting effective strategies. The study findings can guide strategy selection promoting the adoption of physical therapist-led CBT-I-based interventions for chronic pain and insomnia.

Introduction

Chronic pain poses an enormous health and socioeconomic problem being the leading cause of years lived with disability globally, and a major reason for sick leave and early retirement.[1] It is a multifactorial problem,[2,3] often triggered and sustained by factors like insomnia.[4–6] Clinical insomnia symptoms affects up to 73 % of individuals with chronic pain,[6] leading to daytime fatigue, sleepiness, emotional disturbances, memory issues, difficulty concentrating, and reduced quality of life.[7–10] Research indicates a bidirectional relationship between sleep and pain,[4,11] with disturbed sleep predicting chronic pain onset and persistence.[4,12–15] Several mechanisms have been proposed, including disruptions in neurotransmission (serotonin, dopamine, norepinephrine), altered opioidergic signalling, central pain modulation changes, increased inflammation, and psychological factors like depression and maladaptive beliefs.[8,16–19] However, the underlying processes remain unclear.[20] This complex interaction also impacts key factors essential for pain management, including physical activity, emotional well-being, and coping strategies, emphasizing the need for integrated interventions that target both pain and insomnia.[21]

Healthcare providers delivering evidence-based care to individuals with chronic pain are developing cognitive-behavioural skills essential for psychologically informed pain management.[22–25] Cognitive and behavioural change is fundamental in physical therapy for promoting physical activity and lifestyle modifications.[23] As physical therapy increasingly integrates psychologically informed practice,[22,26,27] professionals are developing competencies to apply cognitive behavioural strategies effectively. These competencies align with Cognitive Behavioural Therapy (CBT) principles, which help individuals modify unhelpful thoughts and behaviours to enhance emotional well-being and promote healthier coping. Considering the shared mechanisms between pain and sleep disturbances, CBT-principles used in pain management, such as altering unhelpful thought patterns, modifying behaviours, and enhancing coping, could also be effectively applied to insomnia in individuals with chronic pain. With appropriate additional training, healthcare providers could adapt these principles to address insomnia in individuals with chronic pain[28] and absence of complex psychiatric comorbidities.

International clinical practice guidelines recommend Cognitive Behaviour Therapy for Insomnia (CBT-I) as a first-line treatment due to its clinical and cost-effectiveness.[29–31] CBT-I is a multicomponent therapy that modifies unhelpful beliefs and behaviours towards sleep and replaces them with helpful ones. It has shown long-term effectiveness in improving sleep compared to pharmacological treatments in various clinical populations, including those with chronic pain and insomnia.[29,32] Furthermore, CBT-I-based interventions can be effectively delivered by various healthcare providers,[33–38] including physical therapists.[39] Access to CBT-I in primary care is problematic worldwide,[40–42] often leaving insomnia unaddressed in individuals with chronic pain and insomnia. When addressed, sedative-hypnotics are often prescribed,[40] which carry risks including dependency, drug interactions, and overdose deaths when combined with analgesics.[43,44]

Physical therapists are accessible to individuals with chronic pain, including those with comorbid insomnia. Despite CBT-I's proven benefits, integrating CBT-I-based interventions into physical therapy practice remains challenging. To promote effective adoption, methodologically rigorous implementation research is needed. This study identifies barriers and propose strategies for overcoming them, guided by the Implementation Research Logic Model (IRLM).[45] By understanding and addressing these barriers, this study aims to enhance the translation of evidence supporting physical therapist-delivered CBT-I-based interventions into clinical settings for individuals with chronic pain and comorbid insomnia.

Methods

This study was approved by the Social and Societal Ethics Committee, KU Leuven, with the reference number G-2022–5801-R2(MAR). The study's findings from the focus groups were reported and written up following the guidelines provided by the Standards for Reporting Qualitative Research (SRQR)[46] and the 32-item checklist from the Consolidated Criteria for Reporting Qualitative Studies (COREQ).[47]

Participants

Purposeful sampling recruited a diverse group of stakeholders, including physical therapists, psychologists, general practitioners, and individuals with chronic pain and insomnia - based on predefined criteria (Table 1). The term stakeholder refers to both healthcare providers and patients, highlighting their shared role. Participants with and without CBT-I experience were recruited, and all participants were required to speak English fluently.

Recruitment

Physical therapists, psychologists, general practitioners and individuals with chronic pain and insomnia were recruited between 1 and 31 January 2024. Recruitment occurred via flyers on social media and contacts with professional and patient organizations. Interested individuals received an email with study details, expected time commitment, and group discussion dates. They could contact the research team by email or phone for questions. After clarifications, those still interested received an informed consent form detailing recorded interviews, data protection, withdrawal rights, and a reimbursement of €60 per hour. All participants in the study signed the informed consent.

Table 1
Inclusion and exclusion criteria for specific participant's role.

Subgroup	Inclusion/ Exclusion Criteria
Physical therapists	Regularly treating individuals with chronic pain (including chronic low back or neck pain, chronic nonspecific shoulder, hip or knee pain, chronic whiplash associated disorders, fibromyalgia, and osteoarthritis)
Psychologists	Applying CBT-I for treating insomnia in individuals with chronic pain conditions, with at least 2 patients seen over the past 12 months
General practitioners	Regularly treating individuals with chronic pain
Individuals with chronic pain and insomnia	Suffering from chronic pain, defined as experiencing pain scored as a 3 or higher on a visual analogue scale for pain intensity, on most days of the week, for the last 3 months Suffering from insomnia, according to the DSM-5 criteria: No shift work; For at least >3 days / week, for >3 months, >30 min sleep latency and/or >30 min awake after sleep onset and/or early-morning awakening with inability to return to sleep, and associated daytime symptoms

CBT-I: cognitive behavioural therapy for insomnia.

The implementation research logic model

The IRLM[45] is a tool to develop a logic model of an implementation intervention, with the aim of improving its efficacy (leading to improved implementation outcomes). It is principle-based and adaptable to the specific context of the intervention. The model links five core elements: (1) determinants; (2) clinical intervention; (3) implementation strategies; (4) mechanisms; and (5) outcomes.

- *Determinants* refer to the barriers and facilitators affecting clinical intervention adoption. This study used the Consolidated Framework for Implementation Research (CFIR)[48] to identify them. CFIR divides barriers into five clusters: the intervention's characteristics, inner and outer settings, involved individuals, and implementation process.
- *Clinical intervention* refers to any novel practice, approach, technique aimed at improving patient care. Here, CBT-I constituted the clinical intervention.
- *Mechanisms* explain why and how determinants influence intervention success or failure of intervention's adoption.
- *Implementation strategies* are actions ensuring the clinical intervention's adoption. Pre-selected implementation strategies from the Expert Recommendations for Implementing Change (ERIC)[49,50] were adapted for the purpose of the study (Supplementary Material 1).
- *Outcomes* measure implementation success, including patient-related indicators (e.g., symptomatology, treatment satisfaction) and intervention sustainability.[51]

The components '*mechanisms*' and '*outcomes*' were beyond this study's scope.

Procedure

Participants were invited for 3 online semi-structured group interviews (focus groups) and 1 online questionnaire. Participants were divided in 4 teams, with each team conducting 3 interviews, to enable triangulation. A brochure about CBT-I was provided to participants lacking experience before the sessions (Supplementary Material 2).

The seven-stage procedure developed by Knapp and colleagues[52] to select implementation strategies was adapted to six stages. This procedure represents an integration of different approaches under the IRLM, resulting in a rigorous, iterative process to identify barriers and select strategies to address them. It incorporates user-centered design,[53,54] a modified version of a Delphi approach,[55] and the ERIC protocol.[49,50] This procedure engaged stakeholders at multiple stages (i.e., identifying barriers, developing and fine-tuning implementation strategies, ranking the barriers and prioritizing the strategies) while allowing adaptation to evidence-based practice.[53,54] It also provided multi-stage feedback opportunities, increasing the credibility of research findings.

- Stage 1 involved semi-structured group interviews with physical therapists, psychologists, general practitioners, and individuals with chronic pain and insomnia, to discuss the determinants of CBT-I implementation.
- Stage 2 was conducted by the research team, and involved mapping barriers with potential implementation strategies using the CFIR-ERIC tool, an online tool[56] and consists of 73 strategies identified by the ERIC collaboration.[57]
- Stage 3 was a semi-structured group interview aimed to obtain the participants' feedback on the map from stage 2 and elaborate on selected strategies. Elaboration involved defining and specifying strategies in terms of actor, action, dose, temporality, justification, and expected outcomes, following Proctor et al.[58]
- Stage 4 involved optimizing the map by merging and excluding overlapping strategies.
- Stage 5 prioritized strategies and barriers using an online survey via Qualtrics. The questionnaire had two sections: barriers and strategies. Barriers were rated on a four-point scale (1 = not important, 4 = very important). Strategies were assessed across three dimensions (importance, feasibility, and effectiveness) using a similar four-point scale. The top 10 strategies were selected based on their scores across all dimensions. Background information, such as professional discipline, was collected for subgroup analyses. The 10 highest-scoring strategies were selected among each group of stakeholders separately (i.e., among physical therapists, psychologists, general practitioners, and individuals with chronic pain and insomnia). Strategies that were in the top 10 for a specific group of stakeholders but not the general list were added. Finally, the top 10 barriers were reviewed to ensure a corresponding strategy was identified for each.
- Stage 6 occurred after preparing the final top 10 strategy list. In this stage, one more set of group interviews were conducted. Group interviews were used to fine-tune strategies, outline implementation challenges, and further prioritize strategies qualitatively.

Graphical representation of this stage-by-stage procedure is shown in Fig. 1. The developed guiding questions for the discussions of the first and third stages are provided in Supplementary Material 3. The group interviews were recorded so that researchers could resort to them for notetaking and transcribing.

Data collection and analysis

Online focus groups were conducted in English via Microsoft Teams between February till August 2023 by two interviewers (MM and TJ). MM holds a Master's in Psychology, and TJ is a Postdoctoral Fellow in Health Psychology, both trained in qualitative data collection and implementation sciences. The interviewers had no prior connection with the participants. Video recordings were transcribed manually. The deductive Rapid Turnaround Qualitative Analysis method was used[59] for fast, efficient, and structured data processing.[60] This method offers comparable rigor to traditional qualitative analysis and is both time- and cost-efficient.[61] Two researchers independently coded and analysed the data initially, resolving disagreements through discussion. After reaching consensus, one researcher (MM) completed the analysis, supervised by TJ, before results were shared with participants for validation.

Results

Participants

A panel of 16 stakeholders (8 physical therapists, 3 clinical psychologists, 2 general practitioners, and 3 individuals with chronic pain and insomnia) was included in the study. An overview of the participants' characteristics is provided in Supplementary Material 4.

Regarding the group interviews in stages 1, 3, and 6, the first team included 1 physical therapist, 2 clinical psychologists, and 1 individual with chronic pain and comorbid insomnia. This team focused on the determinants related to patient-therapist interactions, inner settings, and the intervention itself. The second team consisted of 2 physical therapists and 2 general practitioners and focused on the determinants related to interactions between general practitioners and physical therapists, thus addressing barriers and facilitators related to inner and outer settings. The third team was composed of 2 physical therapists from Cyprus and Canada and 2 from Belgium and focused on the process of implementation. A fourth team, similar in composition and scope to the first, included a clinical psychologist, a physical therapist, and two individuals with chronic pain and comorbid insomnia, all from Belgium.

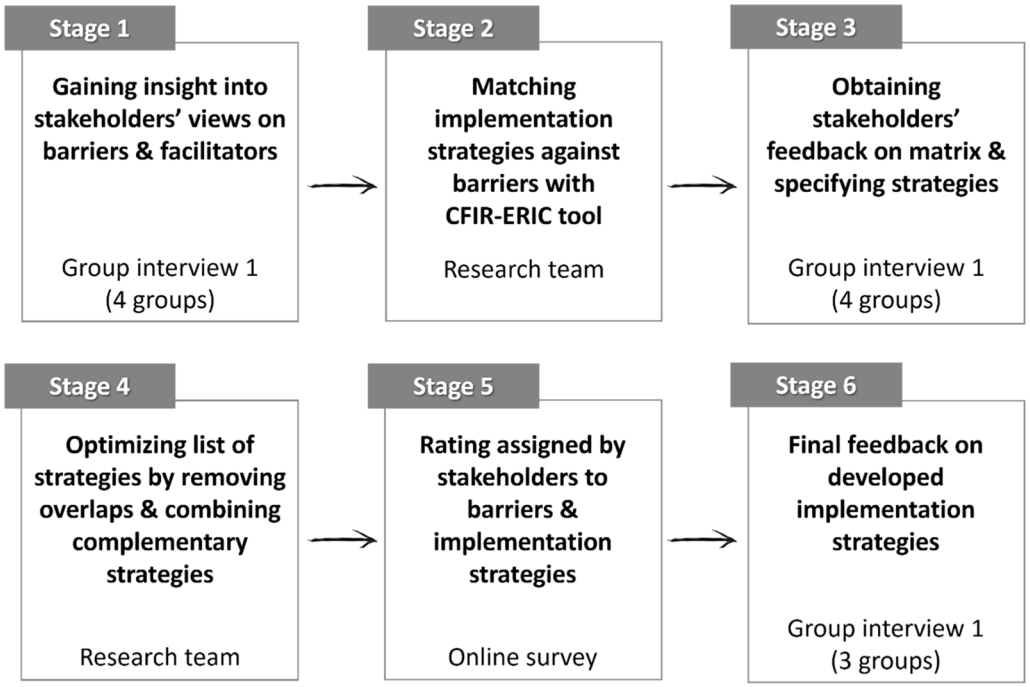

Fig. 1. Six-stage procedure, adopted from Knapp and colleagues[52].

Dropouts

One physical therapist dropped out for undisclosed reasons after the second stage. Another physical therapist dropped out due to health issues after stage 5 and was therefore not at the final group interview (stage 6). There was one participant (physical therapist) who did not fill in the ranking stage (stage 5) due to maternity leave, but she was present in all three group interviews.

Results of the 6-stage procedure

Thirty-three barriers across all domains of CFIR framework (stage 1) and 21 strategies to address them (stages 2, 3, 4) were identified. Barriers identified in the first stage are described in Table 2. The detailed results of stages 2 to 4 are provided in Supplementary Materials 5 and 6. In stage 5, the list of 21 strategies was reduced to 13, based on the sum score on assigned feasibility, importance, and effectiveness derived from the online survey (Supplementary Material 7). The 13 strategies were fine-tuned during the final group interview (stage 6) and divided into first-priority and second-priority strategies. Strategies related to education and training of physical therapists, structural level changes and raising awareness among general practitioners and patients were designated as top priority. Strategies related to promoting adaptability of CBT-I, developing supportive tools, and encouraging multidisciplinary collaboration were assigned as second priority. A detailed outline of the 13 implementation strategies is provided in Table 3 and Fig. 2, and Supplementary Material 8.

Discussion

In this study, a panel of 16 stakeholders identified 33 barriers for the implementation of CBT-I in routine physical therapy practice and formulated 13 implementation strategies to overcome these. Priorities belonging to 'education and training of physical therapists', 'structural level changes', and 'raising awareness among general practitioners and the general population' were assigned as top priority strategies.

Education and training of physical therapists

Physical therapists are increasingly providing psychologically informed treatments. However, in our study, stakeholders identified adherence to the traditional biomedical model as a barrier to integrate sleep management into physical therapy practice. This was primarily due to a lack of confidence in addressing the psychosocial contributors to pain and limited knowledge about the impact of sleep on pain and vice versa. The literature already indicates that developing new attitudes and knowledge to shift from a disease-centered practice to a biopsychosocial focus is often insufficient among physical therapists.[62,63] In parallel, although studies indicate that physical therapists recognize the importance of addressing sleep in patient care, research also reveals that they feel inadequately trained in sleep pathophysiology during their education.[64–68] This highlights the need for enhanced educational initiatives that target the acquisition of skills and competences necessary to provide cognitive behavioural treatments[69,70] as well as improving knowledge of sleep medicine.[71]

Extensive training, emphasizing hands-on experiences, collaborative interactions, and critical reflection, is essential for developing appropriate competencies and skills such as effective communication, shared-decision making, and behavioural change.[72] One proposed implementation strategy for improving physical therapist education and training is a fellowship program where CBT-I experts mentor therapists who lack prior experience in CBT-I-based interventions. This approach aims to accelerate skill development, build confidence, promote evidence-based practice, and foster professional networking,[73,74] which aligns with the recommendations of the European Academy for CBT-I.[75] Yet, it should be in line with the local legislation regarding the practice of health professions. The stakeholders also emphasized the need for dynamic training methods such as role-playing, live demonstrations, reflection, feedback, and multisensory learning to enhance experiential learning.[74,76] Finally, spacing out training sessions to allow time between the learning moments was proposed to facilitate the integration of newly acquired skills into practice.[69]

Table 2
Barriers identified in the first stage of this study with the split by levels of CFIR framework.

CFIR Category	Description from CFIR	Stakeholders-Driven Description of the Barrier
CFIR Level: Intervention Characteristics		
Complexity	Perceived difficulty of implementation, reflected by duration, scope, radicalness, disruptiveness, centrality, and intricacy and number of steps required to implement.	Complexity of CBT-I (stress & other psychological issues are often involved; time-in-bed restriction & cognitive aspects are most challenging).
Adaptability	The degree to which an intervention can be adapted, tailored, refined, or reinvented to meet local needs.	It is difficult to find the right balance between strictly adhering to CBT-I protocol on the one hand, and flexibility to address individual patients' needs on the other hand. Extra components of CBT-I are used as stand-alone techniques (relaxation techniques, sleep hygiene) while the components that define clinical outcomes are often skipped (time-in-bed restriction; cognitive aspects of CBT-I).
Relative Advantage	Stakeholders' perception of the advantage of implementing the intervention versus an alternative solution.	Sleeping pills offer a "quick fix": explicit demands from patients and over prescription by GPs in Belgium. CBT-I requires a lot from a patient, especially time-in-bed restriction which is not always compatible with current lifestyle/ circumstances.
CFIR Level: Inner Settings		
Culture	Norms, values, and basic assumptions of a given organization.	Traditional approaches to physical therapy are dominating. More specifically, the transition from going beyond the "hands-on" approaches is difficult; there is lack of focus towards the psychosocial aspects of pain and sleep; it's not common to be asking patients about their sleep as a physical therapist, etc.
Compatibility	The degree of tangible fit between meaning and values attached to the intervention by involved individuals, how those align with individuals' own norms, values, and perceived risks and needs, and how the intervention fits with existing workflows and systems.	It's difficult for a health care provider to focus on both problems (sleep and pain) simultaneously within one session.
Access to Knowledge & Information	Ease of access to digestible information and knowledge about the intervention and how to incorporate it into work tasks.	Limited access to training and information: no free education; limited opportunities for training; the available training programmes are too short.
Relative Priority	Individuals' shared perception of the importance of the implementation within the organization.	Sleep issues are rarely a primary focus of GPs/ physical therapists – pain is.
Available Resources	The level of resources dedicated for implementation and on-going operations, including money, training, education, physical space, and time.	Lack of time, especially for the initial session. Lack of reimbursement for CBT-I if it is delivered by a physical therapist. Lack of supporting materials required for tracking improvement and for making the explanations easier.
Network and Communication	The nature and quality of webs of social networks and the nature and quality of formal and informal communications within an organization.	Unclear division of roles between a psychologist and a physical therapist. Lack of physical therapists who are trained in CBT-I. Lack of "Navigation System" for GPs (i.e., a "map" or a list of physical therapists who can deliver CBT-I).
Organisational Incentives and Rewards	Extrinsic incentives such as goal-sharing awards, performance reviews, promotions, and raises in salary, and less tangible incentives such as increased stature or respect.	Losing income for CBT-I psychologists if referring a patient to a physical therapist specializing in CBT-I.
CFIR Level: Outer Settings		
Patient Needs and Resources	The extent to which patient needs, as well as barriers and facilitators to meet those needs, are accurately known and prioritized by the organization.	Patients only reach physical therapists very late (when pain is extreme and too overwhelming). There are groups of patients that do not respond well to CBT-I (e.g., those who are overwhelmed with pain/ stress). Sleep is very important, leading to low tolerance for slowly working treatment methods to "fix it" Patients tend to compare the costs of medications to other alternatives such as CBT-I which are less reimbursed by the government One key specialist for a patient with pain & insomnia will be easier, but time-consuming for a healthcare provider.
External Policy & Incentives	A broad construct that includes external strategies to spread interventions, including policy and regulations (governmental or other central entity), external mandates, recommendations and guidelines, pay-for-performance, collaboratives, and public or benchmark reporting.	Lack of guidelines in the context of pain and sleep comorbidity. Not clear how the reimbursement of CBT-I at a physical therapist is arranged. No incentives for "discussing cases" (in comparison to hospital settings) among healthcare providers - an obstacle to collaboration around implementing new approaches as well as an obstacle to multidisciplinary collaboration. Insurance companies may not reimburse CBT-I provided by a physical therapist as it originally falls within the scope of practice of psychologists.

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Table 2 (*continued*)

CFIR Category	Description from CFIR	Stakeholders-Driven Description of the Barrier
Cosmopolitanism	The degree to which an organization is networked with other external organizations.	Limited referrals to pain clinics and to "sleep specialists". Orthopaedic surgeons opt for surgery too soon, not referring patients back to primary care to deal with sleep and pain. Lack of autonomy in the role of physical therapists (dependent on GPs).
CFIR Level: Characteristics of Individuals Involved		
Individual Stage Of Change	Characterization of the phase an individual is in, as they progress toward skilled, enthusiastic, and sustained use of the intervention.	First steps are challenging: it's difficult to start using CBT-I in real practice after getting training.
Knowledge and Beliefs about Intervention	Individuals' attitudes toward and value placed on the intervention as well as familiarity with facts, truths, and principles related to the intervention.	Lack of awareness among GPs about CBT-I and the fact that physical therapists can provide it. Lack of awareness about CBT-I among patients. Negative beliefs among patients. For example, not expecting a physical therapist to be dealing with sleep issues or scepticism towards certain aspects of CBT-I (e.g., relaxation).
CFIR Level: Process of Implementation		
Reflecting & Evaluating	Quantitative and qualitative feedback about the progress and quality of implementation accompanied with regular personal and team debriefing about progress and experience.	Not enough attention is given to patient outcomes (other than functional) as well as to tracking patients' progress in therapy. Lack of quality control - there is no established procedure of ensuring the quality of training of physical therapists in CBT-I.

CFIR: Consolidated Framework for Implementation Research.
CBT-I: Cognitive behavioural therapy for insomnia.
GP: General practitioner.

Structural level changes

Stakeholders underscored that sleep disturbances, when a comorbidity with chronic pain, are often deprioritized by policy regulations. Practice guidelines for integrating CBT-I-based principles into the management of individuals with chronic pain (for example Van Looveren et al., 202,2[28]) are either rather inaccessible or lacking altogether.[70] Also, the legal framework defining the role of physical therapists in delivering CBT-I-based interventions, along with financial incentives such as reimbursement, remains unclear for the stakeholders. Participants emphasized that time constraints pose a significant barrier for general practitioners to screen for sleep disorders in patients with chronic pain and for physical therapists to integrate CBT-I-based interventions within the limited available time during consultations.

To effectively advocate for the implementation of CBT-I-based interventions in physical therapy practice to policymakers and government agencies, robust trial data are needed to demonstrate the effectiveness and cost-efficiency of CBT-I-based interventions provided by physical therapists for individuals with chronic pain and comorbid insomnia. This is needed not only for sleep- and pain- related outcomes, but equally important for quality of life, physical activity, and psychological-related aspects. One high-quality trial is currently available, showing clinically relevant improvements in sleep quality in individuals with nonspecific chronic spinal pain and comorbid insomnia

Table 3
The description of developed strategies and their priorities as defined in stage 6.

ERIC Category	Top Priority Strategies
Education and Training of physical therapists	- Develop a **year-long mentorship programme** in which a physical therapist who is new to CBT-I is paired with an experienced CBT-I provider eligible to provide the all-encompassing CBT-I program (i.e., a clinical psychologist, clinical behavioural specialist or medical doctor), with monthly meetings during which a physical therapist who is learning to use CBT-I-based interventions can share all the difficulties, ask questions, and receive the support needed. - Make the **training dynamic** and increase **the opportunities for getting trained in practical aspects,** by means of introducing role-plays during the trainings (i.e., inviting specially trained actors or individuals with experience of chronic pain and insomnia). - Arrange a **physical therapist-in-training programme** in collaboration with sleep centres from University-based hospital, where physical therapists can gain practical experience by working with patients under supervision.
Raising awareness	- Increase **awareness among general practitioners** by arranging an **E-learning via professional organizations**, on a yearly basis; as part of obligatory educational hours (motivation to take part). - Increase general **awareness among patients/ general public**. This could be done via various media channels (social media, TV, online websites, etc.), info-letters from mutuality, promotion campaign in pharmacies, or education sessions arranged by insurance providers with invited speakers.
Structural Level Changes	- **Adapt chronic pain guidelines** with a message that if pain persists after 3 months, **potential contributing** factors, **including sleep,** need to be screened for. - **Collect the data supporting the need for CBT-I-based interventions** (e.g., reduced economic burden on healthcare, benefits to patients, number of physical therapists that would be able to provide CBT-I-based interventions, estimated demand among patients etc.) to defend the case to professional organisations and governmental health policy makers to get the necessary funding for reimbursement.
Strategies of Secondary Importance	
Promoting Adaptability	- **To customize the therapeutic approach to each patient's unique situation and needs, an initial assessment should be conducted at the start of therapy.** This allows the therapist to identify which aspects are most problematic and require greater focus. Additionally, the assessment helps manage the patient's expectations, guiding them in choosing between an individual or group setting, and determining whether they are currently ready for CBT-I or if a different approach may be more suitable. - **Allow physical therapists to conduct interventions which are based on the principles of CBT-I in group sessions**, to make it easier for the therapist to minimize deviations from the protocol
Developing Supporting Tools	- **Develop a tool for tracking patient progress and conducting initial evaluations, while also assisting in setting specific goals** (to be achieved by the third, sixth, and ninth sessions). This will allow for adjustments to the treatment plan after the third session if no progress is observed. **Monitoring improvements will help keep patients motivated throughout the therapy.** - Design an online map of physical therapists trained in CBT-I-based interventions, **providing general practitioners with a tool to easily locate available therapists** in their area. The map should include details on each therapist's area of specialization, specifically highlighting those trained in CBT-I-based interventions.
Encouraging Multi-disciplinary Collaboration	- **Initiate transdisciplinary education as the foundation for building a multidisciplinary network of adapted CBT-I providers—an initially developed strategy.** However, organizing joint education for psychologists and physical therapists at this stage may

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Table 3 (*continued*)

ERIC Category	Top Priority Strategies
	be challenging. The training program designed for clinical psychologists needs to be adapted for physical therapists, and a dedicated individual should lead this initiative to ensure its successful implementation.
Structural Level Changes	- **Promote CBT-I to companies to reach their targets in taking care of their employees' wellbeing**

ERIC: Expert Recommendations for Implementing Change.
CBT-I: Cognitive behavioural therapy for insomnia.

who received a physical therapist-delivered CBT-I-based intervention integrated within best evidence pain management as compared to pain management alone.[39] Other studies, assessing the clinical as well as cost-effectiveness of a physical therapy-delivered CBT-I-based intervention integrated into pain management, are underway,[77,78] and their results will further inform policymakers and government agencies. These findings should be interpreted cautiously, as randomized controlled trials evaluating the performance of specific healthcare professionals or interventions often have strict inclusion criteria that limit ecological validity. Trials typically include patients with limited psychiatric comorbidities, whereas real-world patients often have more complex psychiatric issues. There is insufficient evidence suggesting these can be managed effectively without additional involvement or guidance of mental health professionals. Recognizing these limits could lead to improved regulatory measures for reimbursement and a clearer definition of the physical therapist's role in sleep management, increasing their confidence in providing CBT-I interventions.

Raising awareness among general practitioners and the general population

In accordance with previous studies,[79,80] participants noted that sleep is rarely a primary focus for patients, general practitioners, and physical therapists, as pain often takes precedence. This can lead to patients with chronic pain and insomnia not discussing their sleep disturbances during consultations or clinicians not assessing sleep.

Overprescription of sleeping medications by general practitioners is another significant barrier to implementing CBT-I in primary care. Patients might prefer rapid results and therefore choose medication instead of behavioural change approaches.[81,82] General practitioners may incorrectly assume that patients will not accept non-pharmacological behavioural approaches and that patients expect a quick fix through medication.[83] Additionally, general practitioners often lack awareness about CBT-I approaches and the role that physical therapists can play in the integration of CBT-I principles for individuals with chronic pain and comorbid insomnia. This is consistent with other studies reporting 'unfamiliarity of general practitioners with CBT-I' as a barrier for implementing CBT-I as first line treatment.[84] For example, a survey of Belgian general practitioners found that only 35 % fully agreed their knowledge of non-pharmacologic approach for insomnia was sufficient.[80]

By changing attitudes and beliefs about managing insomnia and increasing knowledge of patients and clinicians about the content, use, modalities, access, effectiveness, cost-efficiency but also limits of CBT-I-based interventions for individuals with chronic pain, the barrier to refer to or to be referred for non-pharmacological management will decrease. Disseminating this information to patients, healthcare professionals, institutions, and the general population is crucial to improve access to CBT-I for individuals with chronic pain and clinical insomnia. Lastly, the strength of the combined use of CBT-I-based interventions by various healthcare providers within transdisciplinary collaboration will enable a cohesive approach to addressing the multidimensional aspects of a patient's condition, ultimately leading to more personalized and effective care outcomes. A stepped care approach, starting with low-intensity treatments like sleep education and behaviour change, can address sleep difficulties, while more intensive CBT-I can be introduced to address higher levels of clinical complexity.[85,86] This model improves access to care, especially where CBT-I specialists are scarce, and gives allied healthcare professionals, like physical therapists, a key role in managing insomnia in individuals with chronic pain.

Strengths and limitations

The use of advanced implementation research methods to identify barriers and develop strategies for integrating CBT-I-based interventions into physical therapy practice. The stakeholder's feedback at multiple

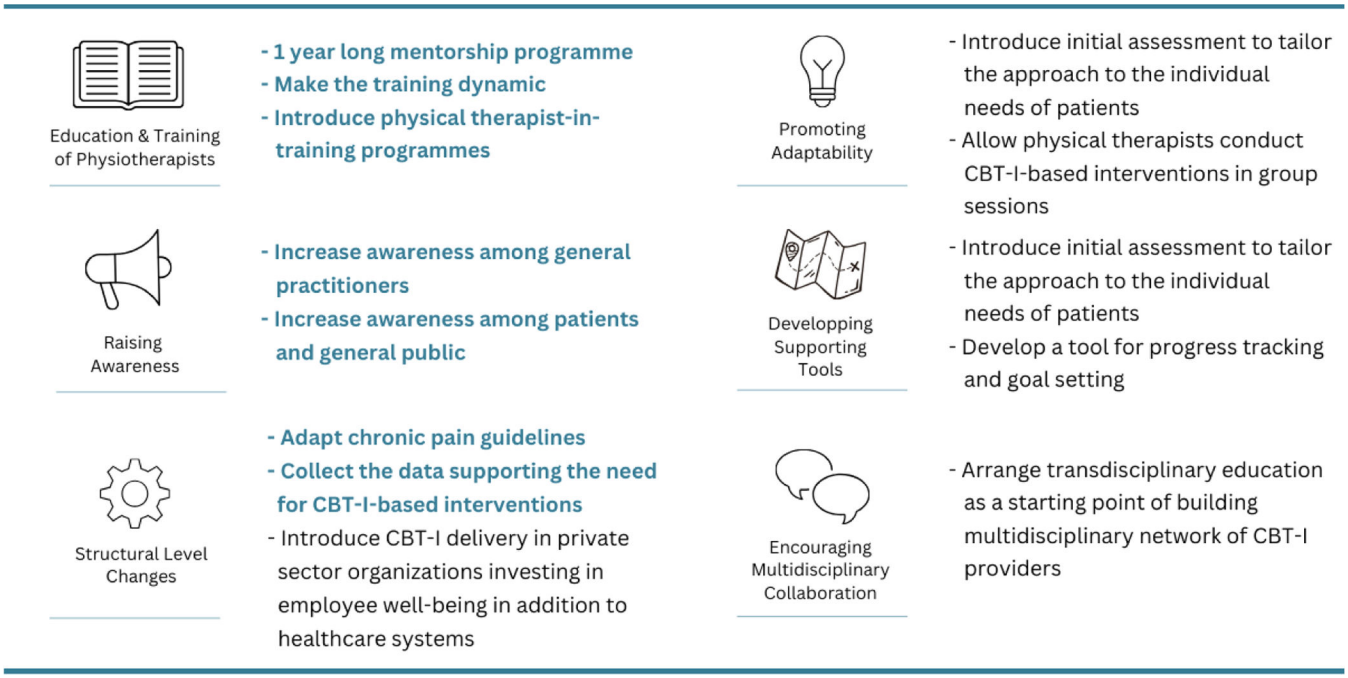

Fig. 2. List of strategies selected after the ranking in stage 5 and prioritisation in stage 6.
CBT-I: Cognitive behavioural therapy for insomnia. Implementation strategies highlighted in blue are top priority strategies.

stages refined findings, ensuring relevance for clinicians and patients applying CBT-I interventions in primary care. Additionally, the diverse stakeholder participation provided valuable insights into barriers from multiple perspectives.[87] Involvement of physical therapists from countries with advanced CBT-I implementation enriched local perspectives, leading to contextually adaptable strategies. While our study focuses on insomnia, physical therapists may also contribute to managing other sleep disorders, such as sleep apnea or sleep bruxism, in individuals with chronic pain.[88–91] Future research could explore this broader role. Although conducted in Belgium, the findings are likely transferable to other healthcare settings. The study primarily involved primary care providers but may not fully capture challenges in private or secondary care. Triangulation mitigated researcher bias, and the group interview format enhanced data richness and validity by fostering participant interaction. Moderation ensured equal contributions from all participants, reducing response bias. While online settings may limit non-verbal cues, they enhanced accessibility and reduced participant burden.

Conclusion

This study led to the identification of 13 strategies to address barriers to implementing CBT-I-based interventions within the domain of physical therapy. The top priority strategies focused on education and training of physical therapists, structural changes and raising awareness among general practitioners and the general population. While this approach is innovative, it also presents certain opportunities and challenges related to transdisciplinary care, which should be taken into consideration while adopting it in further implementation studies.

Declaration of generative AI and AI assisted technologies in the writing process

ChatGPT was used during the preparation of this work to correct grammatical errors, check language, and refine writing. After using this tool, the authors reviewed and edited the content as needed and take full responsibilities for the content of the publication.

Declaration of competing interest

Several authors contribute to research on sleep interventions targeting patients with chronic pain, with financial support for their institutions provided by various organizations, among them the Research Foundation Flanders (FWO). Furthermore, Jo Nijs and Vrije Universiteit Brussel have been compensated for delivering lectures and educational activities by multiple professional and educational organizations.

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Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.bjpt.2025.101243.

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