

SYSTEMATIC REVIEW

Integrating the Biopsychosocial Model in Return to Work Programs: A Systematic Review of Effective Disability Management Practices

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ABSTRACT

Introduction: Return-to-work (RTW) programs are essential components of effective Disability Management Programs (DMPs), designed to support workers facing temporary or long-term impairments. This systematic review consolidates best practices in RTW interventions through a biopsychosocial lens, integrating physical (biological), psychological, and socio-environmental considerations. **Methods:** A total of 153 open-access articles (2015-2025) were screened using PRISMA guidelines, with 19 high-quality studies selected based on an expert-validated evaluation rubric. **Results:** Findings demonstrate biopsychosocial-based interventions markedly improve RTW outcomes, particularly for individuals with musculoskeletal, mental health, and chronic conditions. Effective strategies include early intervention, tailored RTW planning, employer engagement, and stakeholder collaboration. Sustained workability is linked to personalized approaches addressing functional, emotional, and contextual factors. Vocational rehabilitation, psychological support, and workplace accommodations are essential, while sectors with limited flexibility and SMEs require context-sensitive strategies and policy support. **Conclusion:** With the rise of chronic and invisible conditions and increasingly digital, diverse workplaces, RTW strategies must shift toward sustained engagement and well-being.

Malaysian Journal of Medicine and Health Sciences (2026) 22(s8):410-419.doi:10.47836/mjmh.s.22.s8.52

Keywords: Return to work (RTW), Biopsychosocial Model, Disability Management, Systematic Review, Workability

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INTRODUCTION

Workplace efficiency relies on employees' ability to perform daily tasks, yet sustaining long-term workability requires attention to both well-being and psychosocial support [1]. Impaired workability poses major challenges for employers, making structured Return-to-Work (RTW) processes essential. Mental health conditions often complicate reintegration, as hidden struggles prolong absences [2], while workplace social dynamics, particularly coworker responses, strongly influence reintegration outcomes [3]. Work-related disability often leads to economic hardship and reduced quality of life [4], highlighting the need for effective intervention. The biopsychosocial model provides a comprehensive

framework for understanding work disability by integrating biological (physical), psychological, and social factors that influence functional capacity and employment continuity. Employers are legally required to provide reasonable accommodations [5], with workplace adjustments supporting employment continuity and preventing long-term impairment. However, implementation remains complex and costly, requiring funding, specialized personnel, and structured disability management strategies [6, 7], challenges especially acute for SMEs with limited resources [3]. These barriers underscore the need for coordinated and systematically evaluated RTW strategies grounded in a holistic framework.

Job flexibility is a key RTW strategy, improving quality of life and job retention for workers with chronic or episodic conditions [8], though feasibility depends on job demands and tailored solutions. Effective Disability Management Programs (DMPs) mitigate risks associated

with job constraints, interpersonal dynamics, and engagement, while supportive workplaces enhance productivity, prevent impairment, and promote well-being [7]. With an ageing workforce and rising, often invisible conditions, DMPs must prioritize preventive measures to enable timely and safe reintegration [9]. Assessing disability severity using structured frameworks, such as the Enforcement Decree of the Industrial Accident Compensation Insurance Act [10], is essential for tailoring interventions and sustaining employability.

Despite the growing implementation of RTW initiatives, current practices vary widely, and many programs lack systematic evaluation. Evidence on individual RTW interventions exist, but there is insufficient synthesis of how biopsychosocial-aligned strategies contribute to sustainable reintegration and prevent long-term impairment. Studies also differ in how they operationalize RTW success some focus on time to return, while others emphasize recurrence of disability, and which components, such as physical rehabilitation, psychological counselling, or workplace accommodation, contribute most effectively. Although many studies acknowledge the biopsychosocial model, few explicitly examine how its component interact, and even fewer evaluate RTW programs using integrated, multidimensional frameworks.

Moreover, existing studies often examine RTW interventions in isolation, without fully considering how DMPs coordinate multiple stakeholders or align interventions with functional capacity assessments. This lack of comprehensive evaluation limits understanding of which strategies best address complex work-disability trajectories.

These gaps justify the present systematic review, which synthesized evidence on biopsychosocial-aligned RTW components, compares their effectiveness across diverse disability contexts, and evaluates how integrated approaches support sustainable reintegration and long-term employability. The significance of this review lies in its use of structured, criterion-based evaluation framework to systematically assess RTW program components across studies. By applying a transparent and reproducible scoring approach, this review enables consistent comparison of RTW strategies and identifies key biopsychosocial elements associated with comprehensive and coordinated disability management. The findings are expected to provide practical guidance for employers, occupational health practitioners, and policymakers of a future RTW program design, evaluation, and policy development by providing an evidence-based reference framework for inclusive and sustainable RTW practices.

METHODOLOGY

This systematic literature review was conducted to explore published articles that detail the application of RTW programs in corporate contexts. The review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines to ensure a transparent and structured approach [11]. A systematic literature review (SLR) is a methodical, transparent, and replicable process for identifying, evaluating, and synthesizing relevant studies. For this study, the Scopus database was used to retrieve scholarly articles related to RTW programs. The search focused on retrieving studies that explicitly discuss how organizations have implemented RTW programs, particularly for workers with disabilities or those requiring job modifications.

Phase 1: Manuscript Preparation

In the first phase of the study, the manuscript preparation began with a systematic search strategy. Specific keywords such as return to work, workers with disabilities, job modification, and workplace were employed. These keywords were applied to the title, abstract, and keyword fields using Boolean operators (AND, OR) and phrase searching techniques to ensure a thorough and comprehensive search (see Table I). The screening process was guided by several inclusion and exclusion criteria. First, a time filter was applied to include only articles published between 2015 and 2025, ensuring the relevance and currency of the findings. Second, a document type filter was used to exclude editorials and non-research-based publications, focusing the review solely on empirical studies. Third, a language filter was applied to include only articles published in English. Lastly, an access filter was imposed, selecting only open-access articles to promote transparency and

Table I: Initial Manuscript Preparation

Activity	Scopus Query	No. of Article
Query: Identification	(ALL (return AND to AND work) AND TITLE-ABS-KEY (workers AND with AND disability) AND TITLE-ABS-KEY (job AND modification) OR TITLE-ABS-KEY (workplace))	708
1 st Screening	2015 – 2025	375
2 nd Screening	Exclude Editorial	373
3 rd Screening	Limit to English	360
4 th Screening	Limit to Open Access	153
Query: Final for Manuscript Eligibility	(ALL (return AND to AND work) AND TITLE-ABS-KEY (workers AND with AND disability) AND TITLE-ABS-KEY (job AND modification) OR TITLE-ABS-KEY (workplace)) AND PUBYEAR >2014 AND PUBYEAR <2026 AND (EXCLUDE (DOCTYP, "ed")) AND (LIMIT-TO (LANGUAGE, "English")) AND (LIMIT-TO (OA, "all"))	153

reproducibility in the review process. Based on these screening criteria, a total of 153 articles were identified as eligible for inclusion in the review and subsequent analysis.

Phase 2: Manuscript Eligibility

A total of 153 articles were evaluated and analysed with careful attention to content quality and its relevancy. The assessment was guided by an evaluation rubric encompassing five key domains: relevance, methodological rigor, workplace factors, outcomes and findings, and transparency and ethics. This rubric, which formed the basis for the entire evaluation process, was developed and validated by two subject matter experts in ergonomics and return-to-work (RTW), ensuring both content validity and practical applicability. The key evaluation domains are described in **Table II**.

Table II: Manuscript Evaluation Rubric

Domain	Code	Criteria
Relevance	R1	The study focuses on return to work (RTW) or workplace reintegration.
	R2	The study involves workers with disabilities.
	R3	The type(s) of disability are clearly described (e.g., physical, mental, sensory, cognitive).
	R4	The study addresses real workplace conditions, practices, or experiences.
Methodology Rigor	M1	The study design is clearly described and appropriate.
	M2	Sampling strategy is appropriate and justified (including population type).
	M3	Data collection methods and analysis are valid and reliable.
Workplace Factors	W1	The study discusses workplace accommodations, barriers, or enablers for RTW.
	W2	The role of employers, supervisors, or co-workers in supporting RTW is explored.
Outcomes & Findings	O1	The findings are clearly presented and logically support the study's conclusion.
	O2	The study identifies practical implications or real-world considerations for RTW.
Transparency & Ethics	T1	Ethical approval or considerations are reported (e.g., informed consent).
	T2	Funding sources or conflicts of interest are disclosed.

Note: Criterion codes (e.g., R1, M1, W1, O1, T1) are identifiers only and do not indicate numerical values. Scores were assigned separately on a 0-2 scale.

The evaluation framework comprised five main domains, encompassing a total of 13 assessment criteria, as presented in **Table II**. Each criterion was assigned a unique code (e.g., R1, M1, W1, O1, T1) for identification purposes only. These codes functioned as labels and were not treated as numerical values. Each criterion was assessed using a three-point ordinal scoring system. A score of 0 was assigned when the criterion was absent, 1 when partially present, and 2 when fully present, based on predefined evaluation guidelines. Partial

presence indicates that the criterion was mentioned or addressed in a limited manner, whereas full presence indicates comprehensive and explicit coverage. Scores for individual criteria were summed across all five domains to obtain the total score. As 13 criteria were assessed and each criterion carried a maximum of 2 points, the minimum possible total score was 0, and the maximum possible total score was 26. Score ranges were categorized based on the proportion of the maximum possible score. A total score of 22-26, corresponding to approximately 85-100% of the maximum score, was classified as high or comprehensive coverage across criteria. Scores below this threshold (21 or lower) represent less than 85% of the maximum score and were therefore categorized as moderate or lower coverage.

Based on the scores derived from this structured assessment, only 19 articles were scored as high quality (22-26 points) and selected for inclusion in the final synthesis. The result of the evaluation for high-quality articles can be seen in **Table III**.

RESULTS AND DISCUSSION

153 articles published between 2015 and mid-2025 (data to June 13) were identified, averaging 15.3 publications annually, with a brief decline in 2020. Most (59%) were in occupational health and rehabilitation journals, though limiting to open-access sources may have excluded subscription-based studies. The leading outlets were the Journal of Occupational Rehabilitation (28 articles), International Journal of Environmental Research and Public Health (9), Journal of Occupational and Environmental Medicine (7), and Scandinavian Journal of Work, Environment & Health (7). Geographically, research was concentrated in high-income countries, with North America led by Canada (43) and the US (42); Europe's top contributors were the UK (22), the Netherlands (15), Finland and Sweden (9 each), France (8), and Italy and Spain (7 each). In the Asia-Pacific, Australia (23), Malaysia, Indonesia, and Thailand each had one.

Injury recovery and sustainable RTW are influenced by physical, psychological, and social factors, consistent with the biopsychosocial model. Neglecting any of these dimensions delays recovery, increases costs, and hinders RTW, whereas applying this model supports higher RTW rates through personalized and integrated care. The theoretical relevance of the biopsychosocial model helps explain the patterns observed in the reviewed studies, where interventions addressing multiple domains consistently produce better outcomes (see **Table IV**). It is important to note that **Table IV** does not explicitly label intervention as effective or ineffective, as the included studies did not use binary evaluative terms. Effectiveness is inferred from reported outcomes, such as RTW timing, recurrence rates, functional capacity, and worker satisfaction. Therefore, the following discussion

Table III: High-Quality Manuscripts (Scoring Points of 22-26)

References	Domain													Total Score
	Relevance				Methodology Rigor			Work-place Factors		Outcomes & Findings		Transparency & Ethics		
	R1	R2	R3	R4	M1	M2	M3	W1	W2	O1	O2	T1	T2	
Score														
Jetha et al., 2016 [6]	2	2	1	0	2	1	2	2	2	2	2	2	2	22
Camisa et al., 2020 [18]	1	2	2	2	2	2	2	2	0	1	2	2	2	22
Russo et al., 2021 [14]	1	2	2	2	1	2	2	2	2	2	2	2	2	24
Hoosain et al., 2023 [4]	1	2	2	2	1	2	2	2	0	2	2	2	2	22
Bergdolt et al., 2024 [16]	2	2	2	2	2	2	2	1	1	2	2	2	2	24
Buresti et al., 2024 [12]	2	2	2	2	2	2	2	1	0	2	2	2	2	23
de Geus et al., 2024 [22]	2	1	1	2	2	1	2	1	2	2	2	2	2	22
Long et al., 2024 [23]	2	2	2	1	2	2	1	2	1	2	2	2	2	23
Cam et al., 2024 [25]	2	2	2	2	2	2	2	0	0	2	2	2	2	22
Nevala et al., 2024 [24]	0	1	1	2	2	2	2	2	2	2	2	2	2	22
Philips et al., 2024 [30]	1	2	2	2	2	2	2	1	0	2	2	2	2	22
Radford et al., 2024 [13]	2	2	0	1	2	1	2	2	2	2	2	2	2	22
Strid et al., 2024 [17]	2	2	0	2	2	1	2	2	2	2	2	2	2	23
Vendelbosch et al., 2024 [27]	2	2	2	0	2	2	2	2	0	2	2	2	2	22
Beerda et al., 2025 [15]	1	2	1	2	1	1	2	2	2	2	2	2	2	22
Bernaers et al., 2025 [21]	2	2	2	2	2	2	2	1	2	2	2	2	2	25
Chen et al., 2025 [19]	2	2	2	2	1	2	2	1	0	2	2	2	2	22
Maheu et al., 2025 [20]	1	2	2	2	2	2	2	1	1	2	1	2	2	22
Meling et al., 2025 [26]	2	2	2	2	2	2	2	0	0	2	2	2	2	22
Note: Scoring Guide 22–26 points: High quality – include in final synthesis; 16 – 21 points: Moderate quality – include with caution or context; <16 points: Low quality – consider excluding unless uniquely relevant)														

interprets patterns in the literature rather than imposing evaluative labels not used by the original studies.

Multicomponent interventions combining rehabilitation, psychological support, and workplace reintegration generally produced more favourable outcomes than single-focus interventions [6, 12, 13, 14]. These outcomes are reflected in faster RTW, reduced recurrence, and improved functional capacity, particularly when employers, healthcare providers, and employees collaborated [6, 15, 16, 17]. In contrast, administrative-only adjustments consistently yielded weaker outcomes [4] because they fail to address underlying functional limitations or psychological barriers. Structured planning and SME-specific guidelines enhance reintegration [15], and programs combining clinical rehabilitation with structured workplace dialogue or job redesign showed more durable RTW outcomes, aligning physical capacity, mental readiness, and job demands. This contrast illustrated that the success of an RTW program depends less on individual components and more on how multiple elements are integrated.

Adaptive strategies tailored to capacity and job demands [18, 19, 20], such as flexible hours, ergonomic changes, phased reintegration, and vocational rehabilitation, further improve outcomes, especially with clear

policies and active employer involvement [13, 21, 22, 23, 24]. The interaction between stakeholders and biopsychosocial components helps explain variations in RTW outcomes. Employers contribute through modified duties, supervisor communication, and policy clarity; healthcare providers support physical and psychological recovery through treatment planning; and workers contribute through self-management, motivation, and readiness. When these factors are coordinated effectively, the physical, psychological, and social components reinforce one another, producing cumulative effects that accelerate RTW. Conversely, being disengaged by any stakeholder, such as limited employer resources or fragmented healthcare, weakens the interaction, resulting in suboptimal outcomes.

Condition-specific strategies within a biopsychosocial framework were critical for success (see **Table V**). Multimodal rehabilitation for musculoskeletal disorders [4, 14, 21, 25], workplace accommodations for mental health [16, 23, 26, 27], and flexible schedules or assistive technologies for cancer, chronic illness, and persistent limitations [12, 18, 19, 20, 24] were associated with better outcomes. Early engagement, counselling, and digital tools further strengthen reintegration after long-term sick leave [15, 22, 26]. These findings highlight that tailoring interventions to diagnosis-specific trajectories

Table IV: Summary of RTW Interventions categorized by Disability Type, Intervention Approach & Biopsychosocial Components

Study	Disability Category*	Intervention	Further Explanation	Bio	Psycho	Social	Strength	Lesson Learnt
Jetha et al., 2016 [6]	-	System Dynamics Modelling	Multidimensional: Individual attitudes, health factors & org. components.	+	+	+	Outcome influenced by individual attitudes, health, org. factors, mental elements & stakeholder involvement.	Offer a novel systems view on RTW highlighting relationships between organizational, policy & mental elements.
Camisa et al., 2020 [18]	Type 1 Ageing (51-56 yrs old), Chronic Disease	Workplace Health Promotion	Internal reorganization (light-duty), env. & ergo. improvement, structural & technological upgrades, health promotion intervention & job/work changes.	+	+	+	Personalized management based on assessing work capacity and adjusting work conditions accordingly.	Measure program efficacy, comparing illness-related absences before and after (6 and 12 months) with national data.
Russo et al., 2021 [14]	Type 3 LBP	Various Review	Ergonomics exercise, cognitive-behavioral therapy (CBT), and customized action plans.	+	+	+	Workplace exercise programs done with employer support.	Aim to reduce absenteeism and support RTW.
Hoosain et al., 2023 [4]	Type 3 LBP	Various Review	Multimodal/Combined Programs: Combining exercise, ergonomic changes, and behavioral support.	+	+	+	Tailored Action Plans: Personalized plans matching each worker's job, ability, and needs to keep them supported.	Cutting sick leave without phy/mental support doesn't help workers return. A long-term tracking system is needed.
Bergdolt et al., 2024 [16]	Type 2 Major depression (history of psychiatric hospital stays).	Individual Placement & Support	Trained IPS coaches provide ongoing supervision. Interventions include vocational assessment, counselling, and guidance on disclosure.	+	+	+	Lower sick leave and fewer cognitive disabilities increase the chance of returning to work within 1 year.	Less effective for people with common mental disorders and major depression.
Buresti et al., 2024 [12]	Type 3 Cancer Survivors	Various Review	Comprehensive review of interventions, programs, and practices.	+	+	+	Identify factors affecting CSs' RTW (socio-demographic, work & illness). Adjust work hours, workstation & tasks.	Successful RTW needs clear policies, practical strategies, and a personalized, holistic approach.
de Geus et al., 2024 [22]	Type 2 Workers on long-term sick leave.	Vocational Rehabilitation	Key intervention: coaching, counselling, motivational interviewing and planning RTW.	+	+	+	Include several key elements of effective interventions.	Intervention is not effective for people on sick leave longer than 90 days.
Long et al., 2024 [23]	Type 2 Workers on leave from work (mental health concerns).	Occupational Therapy Mental Health	Work performance/function interventions, vocational rehabilitation interventions & nature-based rehabilitation.	+	+	+	Psychosocial interventions effectively reduce employee sick leave.	Occupational Therapist improve outcomes, addressing mental health issues in the workplace.
Cam et al., 2024 [25]	Type 2 Chronic LBP	Multidisciplinary rehabilitation programs	Phy. activity & workshops based on behavioral therapy. Assessed factors (pain, lifestyle, disease history & mental traits).	+	+	+	Patients with chronic LBP and work difficulties should join MRP promptly.	Pain interpretation and coping behavior are key to recovery.
Nevala et al., 2024 [24]	Type 1	Workplaces and Work Ability Support Services	Help working-aged people stay employed or find jobs through support like OHS, rehabilitation, and training.	+	+	+	Created by experts in work ability, rehabilitation, occupational therapy, ergonomics, psychology, and medicine.	Supervisors—key in work accommodations. Clear policies & practices depend on SV's understanding.
Philips et al., 2024 [30]	Type 1 Cognitive Disability	Automated Task Prompting	Assistive Technology	+	+	+	Prioritization of robustness and intuitiveness.	Various cognitive abilities—lack of representative range (cognitive diagnoses & severity levels).

Table IV: CONTINUE

Radford et al., 2024 [13]	Type 3 Major Trauma	ROW-TATE	Vocational Rehabilitation (VR)	+	+	+	Tailored stakeholder-informed & detailed operational planning.	Needs trained staff, employer backing & funding.
Strid et al., 2024 [17]	Type 3 Patients return to work from sick leave	Rehabilitation Coordinator Function	Managers play key role in implementing and supporting the new function by coordinating RTW process for sick leave patients.	,	,	+	Managers serve as rehabilitation coordinators, working with physicians and coworkers as a team.	Collaboration & skill development are vital- RC improve RTW, patient safety, and ease doctors' sick leave workload.
Vendelbosch et al., 2024 [27]	Type 1 Mental Disorder Diagnosis	RTW Trajectories	Identified RTW patterns: fast full, slow full, slow partial and no RTW. Mental disorder diagnosis: examined age, sex, and contracted work hours.	,	+	+	-	Workers need different kinds of help, and their RTW patterns vary by mental health condition and work hours.
Beerda et al., 2025 [15]	Type 3 Long-term sick-leave	SME Tools (Web-based intervention) build through Intervention Mapping	Pilot interviews with employers, employees & occ. doctors, covering 7 areas: legal knowledge, communication, stakeholder engagement, practical support, RTW actions, relapse prevention & policy implementation.	,	,	+	A flexible tool for SME employers that lets them choose the specific phase of an employee's RTW process to get tailored guidance.	Only addresses some employer challenges, focusing on sick-leave support, and leaves out issues like finances and workplace conflicts.
Bernaers et al., 2025 [21]	Type 3 LBP	Workplace Pain Intervention	Ergo risk analysis by external (occ) health service.	+	+	+	Strong stakeholder collaboration and better integration of workplace adjustments into overall rehabilitation.	Active employer involvement, organized support, regular follow-ups, and a simpler process.
Chen et al., 2025 [19]	Type 2 Kidney Cancer Survivor	,	Prospective study: Phone interview, self-administered questionnaire, details on demographic, medical history & job status.	+	+	+	Key determinants of RTW: Physical recovery, fatigue, mental challenges & job type.	Need stronger confidence through psychological support and healthcare rehab.

Note:

Disability Categories:

Type 1. Working but experiencing health-related work limitations – the affected person is still working but is experiencing symptoms that are interfering with his/her work.

Type 2. Off work due to health condition – the affected individual is absent from work due to a health condition.

Type 3. Returned to work with work limitations – the affected individual is back at work but experiencing work restrictions.

Type 4. Withdraw from the labor force – the affected individual is withdrawn from employment due to his or her health condition.

enhances functional recovery and supports sustainable RTW.

System-level analyses (see **Tables VII and VIII**) confirm that biopsychosocial approaches, individualized support, and stakeholder collaboration jointly shape outcomes [6]. Integrating physical rehabilitation, cognitive-behavioural strategies, workplace flexibility, and coordinated healthcare-employer-community support improves recovery across LBP [14, 21]; cancer [12, 19, 20]; and trauma cases [13], reinforcing the biopsychosocial model as the foundation for sustainable RTW. Programs focusing solely on a single domain, such as physical rehabilitation alone, often yielded weaker or temporary effects, whereas multicomponent interventions achieved more stable reintegration outcomes.

Integrating biopsychosocial elements into RTW/DMP

interventions promotes sustainable reintegration by addressing biological (physical), psychological, and social determinants of work absence. Ergonomic adjustments, light-duty tasks, mental health support, and supervisor-led accommodations create a tailored, interdisciplinary approach that fosters resilience, inclusion, and long-term employee well-being while sustaining workability and productivity.

Contextual factors further influence RTW effectiveness. Variations in organization size, sector, and national policy help explain differences across regions. SMEs face resource constraints, public-sector settings tend to implement formal RTW structures more consistently, and countries with strong legislative frameworks show standardized practices. Sectoral differences emerged, with labour-intensive industries prioritizing ergonomic and physical rehabilitation components, whereas service-based and public-sector roles emphasized

Table V: Summary of Key Best Practices (Synthesize existing RTW to explore effective intervention design)

References	Best Practices					
	Biopsychosocial intervention	Stakeholder collaboration and co-design	Personalized and tailored RTW planning	Long-term tracking and sustainability focus	Integration of vocational rehab / occupational therapy	Organizational and policy-level engagement
Jetha et al., 2016 [16]	√	√				
Camisa et al., 2020 [18]			√			
Russo et al., 2021 [14]	√					
Hoosain et al., 2023 [4]			√	√		
Bergdolt et al., 2024 [16]		√		√		
Buresti et al., 2024 [12]	√					√
de Geus et al., 2024 [22]					√	
Long et al., 2024 [23]					√	
Cam et al., 2024 [25]						
Nevala et al., 2024 [24]						√
Philips et al., 2024 [30]						
Radford et al., 2024 [13]	√				√	
Strid et al., 2024 [17]		√				
Vendelbosch et al., 2024 [27]		√				
Beerda et al., 2025 [15]		√				
Bernaers et al., 2025 [21]						√
Chen et al., 2025 [19]			√			
Maheu et al., 2025 [20]			√			
Meling et al., 2025 [26]				√		

Table VI: Classification of Disability Types with Associated Challenges and Effective Support Needs

Disability Type*	Condition Examples	Common Challenges	Effective Support
Type 1	Cognitive limitations, chronic pain, ageing	Reduced function while working	Assistive tech, job redesign
Type 2	Mental illness, cancer, long-term conditions	Off work requires reintegration	Vocational rehab, mental support
Type 3	Post-LBP, chronic illness, trauma survivors	Job restrictions, fatigue, residual pain	Tailored plans, flexible work
Type 4	Rarely addressed (workforce withdrawal)	Permanent disability	Not the focus in these studies

Table VII: Key Elements of Existing RTW and Its Effectiveness

Category	Examples	Effectiveness
Structured RTW programs	IPS, ROWTATE, MRP	Supervised reintegration, coordination, planning.
Workplace accommodations	Ergo & task adjustment, flexible hours.	Enable work despite limitation, sustainable RTW.
Mental & vocational support	CBT, assistive tech, counselling.	Improve mental resilience & cognitive capacity.
Organizational structures	Rehab coordinator, web-based tools, multistakeholder involvement.	Improve implementation, coordination & accountability.
Long-term tracking & feedback	Identified as major need in Hoosain et al.	Evaluate sustainability and reduce relapse.

Table VIII: Impact of Biopsychosocial Elements in RTW/DMP

References	Target Group	Study Outcomes
Jetha et al., 2016 [6]	Overall work-disability	Biopsychosocial interactions are critical in systems-level RTW planning.
Russo et al., 2021 [14]	LBP	Multimodal approaches outperform narrow ones; workplace collaboration vital.
Buresti et al., 2024 [12]	CS	Structured, individualized interventions promote sustainable RTW.
Radford et al., 2024 [13]	Major trauma	Stakeholder coordination across sectors leads to positive reintegration.
Bernaers et al., 2025 [21]	LBP	Employer engagement and follow-up are key to integration.
Chen et al., 2025 [19]	KCS	Fatigue, mental health, and job nature shapes RTW chances.
Maheu et al., 2025 [20]	ITBC	Assesses psychosocial and workplace elements that are often overlooked.

Table IX: Description and Application of Elements in the Biopsychosocial Model

Elements	Key Considerations for RTW/ DMP Future Planning	Example Interventions / Strategies
Biological (Bio) Physical/medical aspects of a worker's condition (e.g., pain, fatigue, functional limitations).	Assess physical recovery, match with job demands, ensure medical clearance & monitor residual symptoms.	• Functional capacity assessments. • Ergonomics adjustments. • Light-duty placement. • Fatigue management plans.
Psychological (Psycho) Emotional wellbeing, mental health, cognitive functioning, self-motivation.	Assess mental readiness, stress, resilience, and screen for depression, anxiety, and burnout.	• Cognitive Behavioural Therapy (CBT). • Psychological counselling, nature-based therapy. • RTW coaching, self-efficacy building.
Social (Socio-Occupational) Workplace relationships, environmental factors, & support that facilitate/hinder reintegration.	Ensure supervisor support, clear communication, anti-stigma culture & flexibility in job roles/hours.	• Workplace accommodations, gradual RTW plans. • Supervisor training, peer support. • Rehabilitation coordinator.

psychological support and workload adjustments. National policy frameworks further shaped outcomes, with regions enforcing strong RTW legislation or disability accommodation mandates demonstrating more consistent implementation of biopsychosocial elements, while regions with weaker policy structures or fragmented insurance systems showed greater variability in program quality. These contextual influences help explain why similar interventions produced different outcomes across the studies reviewed, emphasizing the need for policy-aligned, context-sensitive RTW strategies.

CONCLUSION

This systematic review highlights RTW programs as critical components of effective DMPs. High-quality evidence shows that biopsychosocial interventions addressing physical health, psychological well-being, and workplace environment improve sustainable reintegration. Key success depends on early intervention, stakeholders' collaboration, and personalized RTW plans matching individual functional abilities. Programs involving supervisors, flexible work arrangements, and psychological support better promote long-term employment, prevent relapse, and boost productivity. At the organizational level, employers should implement structured RTW policies, equip supervisors with appropriate training, and ensure access to graded work modifications and mental-health resources. Policy frameworks also play a pivotal role. National RTW guidelines, offering incentives for employer participation, and regulatory enforcement foster consistent, inclusive workplace practices. Adapting interventions to the organization's size, sector, and resources ensures practical and effective implementation, particularly in SMEs or sectors with limited infrastructure.

As workforce needs evolve, RTW strategies must remain interdisciplinary, prevention-focused and adaptable, integrating physical, psychological, and social components while coordinating multiple stakeholders. Future research should employ longitudinal designs to assess sustained RTW outcomes, utilize standardized

outcome measures to facilitate comparability, and apply rigorous methodologies to determine the most effective program components. Generating this evidence will support the development of adaptive, evidence-based disability management frameworks that align organizational practices with employee needs, fostering safe, inclusive, and sustained workforce participation.

ACKNOWLEDGEMENT

The authors would like to thank the Universiti Tun Hussein Onn Malaysia (UTHM) for providing financial support under the Tier 1 Research Grant (University Reference: Vot Q972). The authors also gratefully acknowledge the research facilities provided by UTHM, which significantly contributed to the successful completion of this work.

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