BMC Health Services Research

SYSTEMATIC REVIEW Open Access

Advancing knowledge translation processes in motor rehabilitation for children with cerebral palsy and developmental coordination disorder: insights from a scoping review

Léa Obrecht[1*], Femke van Abswoude[1], Katrijn Klingels[2,3] and Bert Steenbergen[1]

Abstract

Background Early motor rehabilitation improves daily functioning and quality of life for children with cerebral palsy and developmental coordination disorder, but evidence-based practices are often underused in clinical settings. Knowledge translation supports the application of research findings into clinical practice, yet knowledge translation processes in paediatric motor rehabilitation are highly variable, and there is limited understanding of how they are designed or how clinicians and caregivers are engaged.

Methods Following a scoping review methodology, we identified studies on motor rehabilitation for children and adolescents (0–21 years) with cerebral palsy and/or developmental coordination disorder that reported on a knowledge translation process. Charted data included study characteristics, use of knowledge translation theory, and structure of the knowledge translation process. A narrative synthesis and content analysis were used to identify themes across studies.

Results This review included 17 articles. 14 studies reported using knowledge translation theories, most commonly the Knowledge-to-Action (KTA) framework, though their application was selective and inconsistent. Knowledge translation steps were applied variably in number and sequence, spanning the creation of evidence to the assessment of its implementation, long-term outcomes measures were often missing. Clinicians were primarily engaged as data sources, using varied methods and timing. Self-reported measures of evidence-based practice knowledge and use were the most frequently measured outcomes.

Conclusions To further understand knowledge translation in motor rehabilitation for children with cerebral palsy and developmental coordination disorder, we need clearer reporting of decision-making within knowledge translation processes, more systematic application of theory, long-term study designs, and standardised methods for stakeholder engagement. Strengthening the practical relevance of knowledge translation in paediatric motor rehabilitation

*Correspondence:
Léa Obrecht
lea.obrecht@ru.nl

Full list of author information is available at the end of the article

also requires greater recognition of clinicians' and caregivers' perspectives and their active engagement in decision-making. These improvements can support more consistent implementation of evidence-based motor rehabilitation practices and ultimately improve outcomes for children with cerebral palsy and developmental coordination disorder.

Keywords Knowledge translation, Implementation science, Cerebral palsy, Developmental coordination disorder, Paediatric motor rehabilitation, Stakeholder engagement, Scoping review

Background

Cerebral palsy (CP) and developmental coordination disorder (DCD) are among the most common causes of childhood motor disorders with a prevalence of 1.6 per 1000 live births and 5% of children, respectively [1, 2]. CP is defined as a group of permanent disorders of movement and posture resulting from non-progressive disturbances that occurred in the developing fetal or infant brain [3]. These disorders may lead to difficulties in daily functioning, participation, and quality of life. DCD is defined as a marked impairment in motor coordination which impacts motor performance but also academic achievement, inter-personal relationships, physical health and overall well-being [4, 5]. Because motor function is directly impacted in CP and DCD, early motor rehabilitation is essential for lifelong functional independence and quality of life of individuals with these conditions. Although evidence-based practices (EBP) improve outcomes and cost-effectiveness in CP and DCD rehabilitation, their use in clinical settings remains scarce [6–9]. This research-practice gap underscores a waste of resources invested in research and missed opportunities to improve the quality of care and reduce personal and societal costs of CP and DCD. Bridging this gap requires better translation of research evidence to clinical practice. To advance this translation process and to identify the "blind spots" in this process, we will review how evidence is currently translated into motor rehabilitation for children with CP and DCD, the theoretical underpinnings of this process, and the collaboration between parties involved in bridging the research-practice gap.

An effective way to bridge this gap is through the process of Knowledge Translation (KT). Although the concept of KT is used differently across regions and the proliferation of related terms undermines consensus on what KT means, this paper follows the World Health Organization's framing of KT as "the synthesis, exchange and application of knowledge by relevant stakeholders to accelerate the benefits of global and local innovation in strengthening health systems and improving people's health." [10, 11]. Following this definition, turning research findings into practical applications encompasses a broad spectrum of stages and steps that align with implementation science perspectives [12, 13]. In this paper, stages refer to key milestones including the creation of knowledge, its diffusion outside of academia, its dissemination to a targeted audience, its adoption in organisations, its implementation in practice, and sustaining its use [14]. Moving from one stage to the next requires operational actions, referred to as steps in this review. We developed Fig. 1 to provide a visual illustration of these stages and example steps.

Understanding KT steps requires acknowledging the diverse groups of knowledge users it involves. They include health professionals, the general public, patients, caregivers, health managers, researchers, public policy makers, and biomedical industry executives. In this paper, we refer to them as stakeholders with an emphasis on health professionals and caregivers. Communication between researchers and stakeholders in KT can follow four models: the Push, Pull, Exchange, and Integrated models [15]. In the Push model researchers provide knowledge they consider relevant to stakeholders. In the Pull model stakeholders request needed knowledge from researchers. In the Exchange model a two-ways communication between researchers and stakeholders allows for mutual benefits. Lastly, the Integrated model combines the previous approaches through ongoing collaboration between researchers and stakeholders with tailored push efforts and a pull support to facilitate knowledge access for stakeholders. Adopting an Integrated Knowledge Translation (IKT) approach has been shown to enhance KT effectiveness by ensuring relevance and applicability through continuous partnerships between researchers and stakeholders at every stage [16, 17]. Although IKT is recognised as beneficial, it is not yet clear how consistently this collaborative approach is applied in current KT practices. This paper describes how such collaboration is currently operationalised within the existing KT processes.

Within the literature a wide range of KT interventions exists, making it challenging to clearly understand how knowledge is translated into motor rehabilitation for CP and DCD. Multiple reviews have synthesised aspects of KT, each looking at different components of the process. One review in paediatric rehabilitation highlighted diverse barriers such as limited resources, lack of time, organisational challenges, limited funding, and insufficient knowledge, and identified facilitators including protected time, knowledge brokers, tailoring methods, organisational support, and incentives [18]. Other reviews highlighted KT intervention content without explaining why its components where chosen [18, 19]. KT initiatives typically focused on stakeholder education

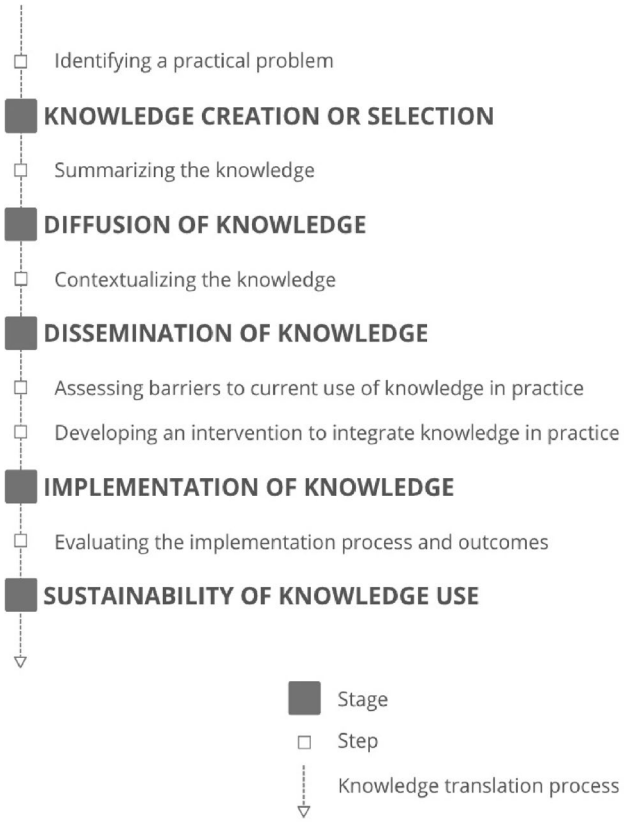

Fig. 1 Stages and steps of a knowledge translation process

through training sessions, case studies, mentoring, and digital resources, while stakeholder engagement strategies were less frequent. Reviews on KT effectiveness similarly show that interventions tend to improve knowledge and skills more than confidence, behaviour, or intention to use evidence [20, 21]. Despite this body of work, a comprehensive overview of the complete KT processes including steps, their sequence, causality, and theoretical justification is missing. This gap highlights the need for a review to synthesise current knowledge on translation processes. A scoping review is particularly relevant to address the topic's complexity by providing an inclusive mapping of evidence. While some reviews cover general paediatric healthcare [21, 22], paediatric pain [23] or broader CP rehabilitation [18], we specifically focus on motor rehabilitation for children with CP and DCD, given its central role in daily living and occupational functioning and the high prevalence of these conditions as causes of motor impairment in childhood.

The purpose of the present scoping review is to explore the design and stakeholder engagement of KT processes used to promote evidence-based motor rehabilitation for children with CP and DCD. Specifically, we seek to outline the sequence of the stages and steps in these processes, and determine whether they are informed by theories. Additionally, we aim to examine how, when and why stakeholders are engaged through the processes. The findings will expand our understanding of current KT initiatives and identify opportunities to enhance the translation of evidence into CP and DCD motor rehabilitation. This review addresses three research questions:

1. What are the stages, steps, and their sequence within the KT processes used to promote EBP in motor rehabilitation for children with CP and DCD?
2. What theories underpin KT processes in motor rehabilitation for children with CP and DCD?
3. How are stakeholders engaged in the KT processes in motor rehabilitation for children with CP and DCD?

Methods

This scoping review followed the methodological framework outlined by Arksey and O'Malley (2005) divided in five stages: identify the research question, identify relevant studies, select studies, chart the data, summarise the results. Reporting is guided by the Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) checklist [24].

Eligibility criteria

Studies were eligible if they focused on motor rehabilitation for children and adolescents (0–21 years) with CP and/or DCD, and addressed the translation of research evidence into motor rehabilitation practice. All study designs were included and no exclusion criteria were applied for publication dates and countries of origin. Studies were excluded if they did not report the development and/or application of a KT initiative. We defined a KT initiative as any deliberate, structured activity aimed at translating research evidence into evidence-based practices or tools, and/or disseminating and implementing those practices or tools. Additional exclusion criteria were studies that only assessed the effectiveness of motor rehabilitation interventions, only assessed current rehabilitation practices, were related to non-motor rehabilitation, focused on adults with CP and DCD, focused on patient management, were not reported in English. Wrong publication types included editorials, letters, conference abstracts, and theses. Studies focusing on patient management were excluded if they primarily addressed the organisation or coordination of individual patient care, rather than the delivery or implementation of motor rehabilitation.

Literature search strategy and information sources

A search strategy including suitable keywords, and mesh terms was developed in collaboration with a librarian, external to the project, and the research team. The three primary keywords agreed upon were KT, motor skills disorders, and rehabilitation. This strategy was

implemented in PubMed/MEDLINE (Ovid), EMBASE (Ovid), CINAHL, and PsycINFO (Ovid) to collect the literature data on November 26th 2024. The search was updated on March 1st 2026 using the same strategy to identify studies published from November 26th 2024 to March 1st 2026 (see Additional file 1 for our complete search strategies).

Screening the target literature

All citations identified through the search were exported and de-duplicated using Endnote software. The screening process was performed in two rounds using the review management tool Rayyan software [25]. During the first round, two reviewers (LO and FVA) screened titles and abstracts of potentially eligible studies. For the second round, the same two reviewers screened full-texts of remaining studies, and reasons for exclusion were recorded. In each round, eligibility was assessed independently by the reviewers. In case of disagreement during titles and abstracts screening, the studies were included in the full-text round. Conflicts during the full-text screening were resolved by consensus. The PRISMA flow diagram illustrates the study selection process (Fig. 2).

Data extraction

Relevant data for our research questions were charted based on inductive coding in a data extraction table created by the first author and reviewed by a co-author. Initial coding categories were developed from a preliminary review of a subset of studies, then refined through repeated comparison across all studies to ensure they were comprehensive and consistently applicable. Charted data were divided in study characteristics, use of theory, and structure of the KT process. Study characteristics included authors, date of publication, title, population of rehabilitation, country studied, stakeholders engaged, implementation focus, implementation settings, and translation goal. The use of theory included the names of the theories solely mentioned, the theories applied in detail, and steps guided by each theory. The structure of the KT process included the steps addressed, the steps' sequence, the KT intervention duration, the post-tests'

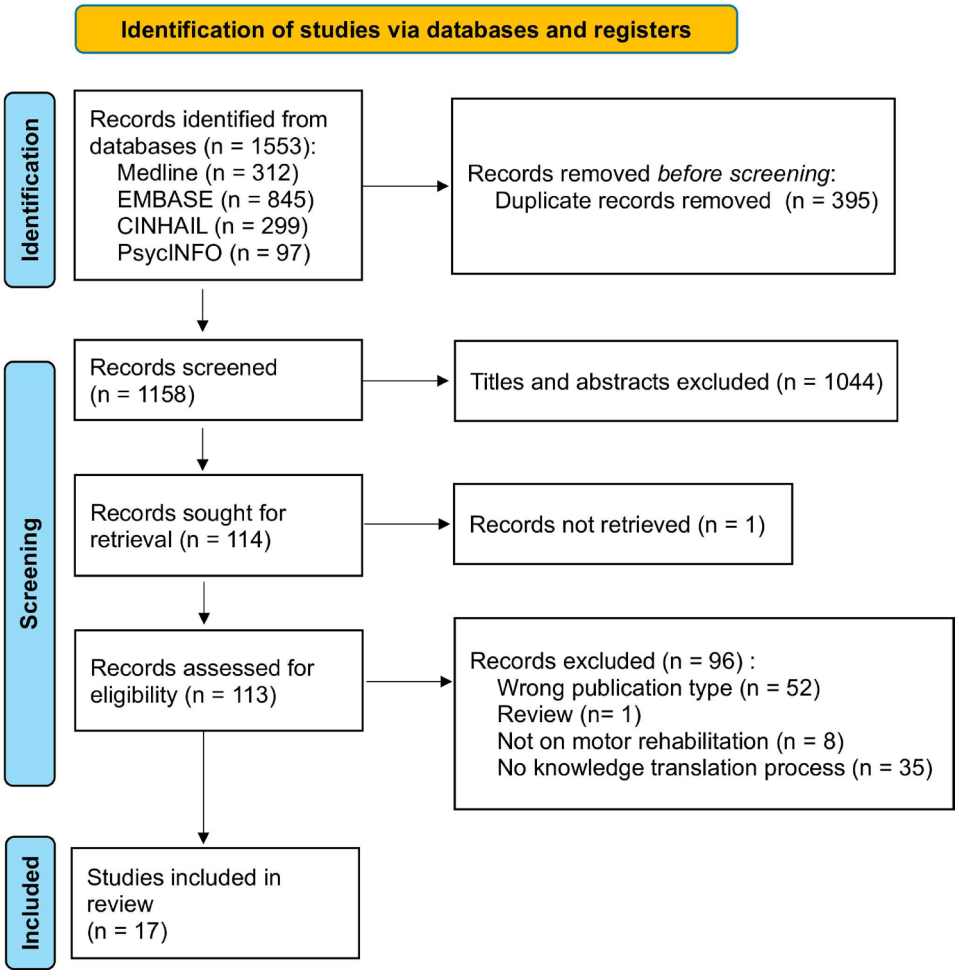

Fig. 2 Literature search process updated on March 1st 2026

timing, the methods and content of pre/post-testing, and the methods and content of stakeholders' consultation (see Additional file 2 for our complete data extraction table). Following the initial extraction by the first author, all extracted data were independently verified and approved by a co-author.

Data summary and synthesis

A narrative approach was used to organise charted information into key categories aligned with our data extraction framework: study characteristics, use of theory, sequence of KT processes, data collection timing, methods and content of pre/post-testing and stakeholders' consultation. Descriptive statistics were used where appropriate to summarise quantitative data. For qualitative data, we employed a basic qualitative content analysis using an inductive approach [26]. Specifically, we conducted open coding of extracted data and iteratively organised it into a coding framework to identify common patterns and variations across studies. Summary tables and visual maps were generated to present study characteristics and KT processes.

Results

In total, 17 studies were included for this scoping review (Fig. 2). A greater number of studies focused on motor rehabilitation for children with CP (n = 13) [27–39] than for children with DCD (n = 4) [7, 40–42] (Table 1). The majority of them studied Canadian (n = 8) [7, 29–32, 40–42] and Australian (n = 5) [27, 34, 36, 37, 39] settings. Implementation settings were health organisations (n = 11) [27–30, 32, 36–41], health organisations combined with private practice settings and schools (n = 4) [7, 31, 34, 42], and home settings (n = 2) [33, 35]. The stakeholders participating in the studies were mainly health professionals (n = 14) [7, 27, 28, 30–32, 34, 36–42]. Fewer studies involved the participation of both health professionals and caregivers (n = 2) [29, 33] or only caregivers (n = 1) [35]. Some of the studies focused on the implementation of general evidence-based practices (n = 10) [7, 27, 29, 30, 34, 36, 37, 40–42] while some aimed to implement specific evidence-based interventions or measurement tools (n = 7) [28, 31–33, 35, 38, 39]. The KT goals for each study are detailed in Table 2.

Table 1 Characteristics of included studies

Characteristics	Number of studies (n = 17)
Population of rehabilitation	
Children with CP	n = 13
Children with DCD	n = 4
Country studied	
Canada	n = 8
Australia	n = 4
Australia and New Zealand	n = 1
Netherlands	n = 2
Ethiopia	n = 1
United States, Mexico, the United Kingdom, and Poland	n = 1
Stakeholders	
Health professionals	n = 14
Health professionals and caregivers	n = 2
Caregivers	n = 1
Implementation focus	
General EBP	n = 10
Specific interventions or measurement tools	n = 7
Implementation settings	
Healthcare organisations	n = 10
Healthcare organisations, private practice, and schools	n = 4
Homes	n = 2

Application of theory

The application of one or more theories from behavioural or implementation sciences to guide the KT process were reported in 14 out of 17 studies. Across these 14 studies, we identified 13 distinct theories, models, or frameworks. The Knowledge-to-Action Framework (KTA) of Graham et al., [12] was the most commonly used (n = 9) [7, 27, 29–32, 34, 40, 41]. Other theories, models and frameworks were not mentioned more than once across the included studies. Among them were the Theoretical Domains Framework of Michie et al., [43] applied in [39], the Behaviour Change Wheel combined to the Capability, Opportunity, Motivation- Behaviour (COM-B) model of Michie et al., [44] applied in [39], the Consolidated Framework for Implementation Research (CFIR) of Damschroder et al., [45] applied in [36], the Diffusion of Innovations theory of Rogers [42](1983) applied in [36], and the Theory of Reasoned Action of Fishbein and Ajzen [46] combined to the Theory of Planned Behaviour of Ajzen [47] applied in [42]. The Integrated Knowledge Translation approach was mentioned in one study [29].

However, several studies (n = 4) reporting the use of theories, mentioned them without justifying their relevance for the study or detailing the ways they were applied [31, 32, 34, 38]. Only a subset of the studies provided details on how the theories guided parts of or the entire process (n = 9) [7, 27–30, 36, 39–42]. The KTA framework was used to guide and break down the whole KT initiative [7, 27, 29, 30, 40, 41]. Each step addressed in the studies was presented with clear connections to the corresponding elements of the framework. Sakzewski et al., [39] mapped implementation barriers using the Theoretical Domains Framework and identified strategies to address them via the Behaviour Change Wheel and the COM-B model. In Imms et al., [36], the CFIR guided the analysis of a rehabilitation intervention characteristics,

Table 2 Knowledge translation goals of included studies

Population of rehabilitation	Title	Year of publication	Authors	Translation goals
CP	A KT intervention including the evidence alert system to improve clinician's evidence-based practice behavior—a cluster randomized controlled trial	2013	Campbell, L., Novak, I., McIntyre, S., Lord, S.	To evaluate the effectiveness of a multifaced KT intervention for implementing EBP.
	Training Paediatric Therapists to Deliver Constraint- Induced Movement Therapy (CIMT) in Sub-Saharan Africa	2015	Coker-Bolt, P., DeLuca, S. C., Ramey, S. L.	To implement Paediatric Constraint-Induced Movement Therapy (P-CIMT) training for therapists.
	Evidence-based early rehabilitation for children with cerebral palsy: co-development of a multifaceted knowledge translation strategy for rehabilitation professionals	2024	Hanson, J. H., Majnemer, A., Pietrangelo, F., Dickson, L., Shikako, K., Dahan-Oliel, N., Steven, E., Iliopoulos, G., Ogourtsova, T.	To co-design and assess a multifaced KT strategy to support the implementation of EBP.
	Implementation of a knowledge translation strategy to promote early evidence-based rehabilitation for children with cerebral palsy	2025	Hanson, J., Majnemer, A., Shikako, K., Dahan-Oliel, N., Pietrangelo, F., Dickson, L., Steven, E., Iliopoulos, G., & Ogourtsova, T.	To evaluate the implementation impact of a multifaced KT strategy to support the implementation of EBP.
	The Challenge of Moving Evidence-Based Measures into Clinical Practice: Lessons in Knowledge Translation	2008	Ketelaar, M., Russell, D. J., Gorter, J. W.	To implement two evidence-based measurment tools for rehabilitation. Gross Motor Function Measure (GMFM) amd Function Classification System (GMFCS)
	Physical Therapists Are Key to Hip Surveillance for Children with Cerebral Palsy: Evaluating the Effectiveness of Knowledge Translation to Support Program Implementation	2021	Miller, S., O'Donnell, M., Mulpuri, K.	To develop and assess an online learning module to support the implementation of a hip surveillance programme.
	Using knowledge brokers to facilitate the uptake of pediatric measurement tools into clinical practice: a before-after intervention study	2010	Russell, D. J., Rivard, L. M., Walter, S. D., Rosenbaum, P. L., Roxborough, L., Cameron, D., Darrah, J., Bartlett, D. J., Hanna, S. E., Avery, L. M.	To facilitate the use of four measurement tools for rehabilitation. Gross Motor Function Classification System (GMFCS); Gross Motor Function Measure (GMFM-88 and GMFM-66); Motor Growth Curves (MGCs)
	Development of GO Move: A Website for Children With Unilateral Cerebral Palsy	2024	Shierk, A., Roberts, H., Habeeb, Y., Dursun, N., Cekmece, C., Bonikowski, M., Pyrzanowska, W., Carranza, J., Granados Garcia, G., Clegg, N., Delgado, M. R.	To implement an home-based rehabilitation programme.
	Implementing accurate identification and measurement of dyskinesia in cerebral palsy into clinical practice: A knowledge translation study	2019	Stewart, K., de Vries, T., Harvey, A.	To improve evidence-based identification, classification and measurement of dyskinesia by clinicians.
	Parents' experiences with a home-based upper limb training program using a video coaching approach for infants and toddlers with unilateral cerebral palsy: a qualitative interview study	2022	Verhaegh, Anke P. M., Nuijen, Nienke B., Aarts, Pauline B. M., Nijhuis-van der Sanden, Maria W. G., Willemsen, Michèl A. A. P., Groen, Brenda E., Vriezekolk, Johanna E.	To evaluate parent's experiences with an early homebased upper limb training programme.

Table 2 (continued)

Population of rehabilitation	Title	Year of publication	Authors	Translation goals
	Efficacy of a knowledge translation approach in changing allied health practitioner use of evidence-based practices with children with cerebral palsy: a before and after longitudinal study	2021	Imms, C., Kerr, C., Bowe, S. J., Karlsson, P., Novak, I., Shields, N., Reddihough, D.	To increase routine evidence-based assessment behaviours.
	Do supports and barriers to routine clinical assessment for children with cerebral palsy change over time? A mixed methods study	2023	Kerr, C., Novak, I., Shields, N., Ames, A., Imms, C.	To assess professionals' perspectives on facilitators to routine clinical assessment.
	Translating Evidence to Increase Quality and Dose of Upper Limb Therapy for Children with Unilateral Cerebral Palsy: A Pilot Study	2016	Sakzewski, L., Ziviani, J., Boyd, R. N.	To pilot effectiveness of a tailored multifaced implementation programme to change clinical practice of occupational therapists providing upper limb therapy.
DCD	Developmental Coordination Disorder in Alberta: A Journey into Knowledge Translation	2020	Schell, S., Roth, K., Duchow, H.	To support an occupational therapy and physiotherapy practice shift from an impairment-based model to a family centred model.
	Knowledge to Practice in Developmental Coordination Disorder: Utility of an Evidence-Based Online Module for Physical Therapists	2015	Rivard, L., Camden, C., Pollock, N., Missiuna, C.	To develop and evaluate an evidence-based online learning module.
	Knowledge to practice in developmental coordination disorder: impact of an evidence-based online module on physical therapists' self-reported knowledge, skills, and practice	2015	Camden, C., Rivard, L., Pollock, N., Missiuna, C.	To evaluate the impact of an online learning module on physiotherapists' knowledge, skills and practice.
	Can a Community of Practice Improve Physical Therapists' Self-Perceived Practice in Developmental Coordination Disorder?	2017	Camden, C., Rivard, L. M., Hurtubise, K., Heguy, L., Berbari, J.	To evaluate the impact of a Community of Practice (CoP) on physiotherapists' knowledge, skills and practice.

in order to inform the design of its KT. The Theory of Reasoned Action and the Theory of Planned Behaviour guided the data collection content and methods of Camden et al., [42]. Additional theories, models and frameworks were mentioned in some studies without further explanation regarding their application [36, 38].

Steps' sequence in KT processes

We employed a structured methodology to extract and analyse data on the sequence of KT processes described in the included studies. When multiple publications appeared to describe the same KT initiative, we identified them through shared authorship, overlapping project descriptions, and references to the same intervention or implementation context. These publications were then grouped and analysed as a single initiative. This applied to Hanson et al., [29] and Hanson et al., [30], to Rivard et al., [41], Camden et al., [7], and Camden et al., [42], as well as for Imms et al. [36], and Kerr et al. [37], . In total, 13 KT processes were analysed. In addition, while some KT steps were explicitly described in the included studies, others had to be reconstructed by the authors through interpretation of contextual information and consultation of related publications (see Additional file 2). When parts of a KT initiative were reported in related studies that did not meet this review's inclusion criteria, we consulted those non-included papers solely to clarify the sequence or timing of KT activities.

The KT process steps reported in the studies were grouped in eight categories through coding to better delineate them. We coded KT steps based on their explicit reporting in the studies whenever possible and relied on our judgment when information was missing. The categories that emerged are the early stakeholder consultation, the knowledge creation and/or selection, the pre-test, the adaptation of knowledge and design of KT intervention, the implementation of the KT intervention, the post-tests at Time1, Time2, and Time3. The sequence of the steps reported in each study is presented according to these categories in Fig. 3. Steps reported in the studies ranged from 2 to 7 categories. The early stakeholder consultation was either reported as being in the first position within the sequence (n = 5), simultaneous to the knowledge selection (n = 1), simultaneous to the KT intervention design (n = 3) and/or in-between the knowledge selection and the KT intervention design (n = 4). In several studies, the early stakeholder consultation was reported in several positions within the sequence (n = 3). The pre-test occurred either before (n = 3) or after (n = 7) the intervention design. When reported, the implementation of the KT intervention and the post-test consistently appeared in the same positions within the

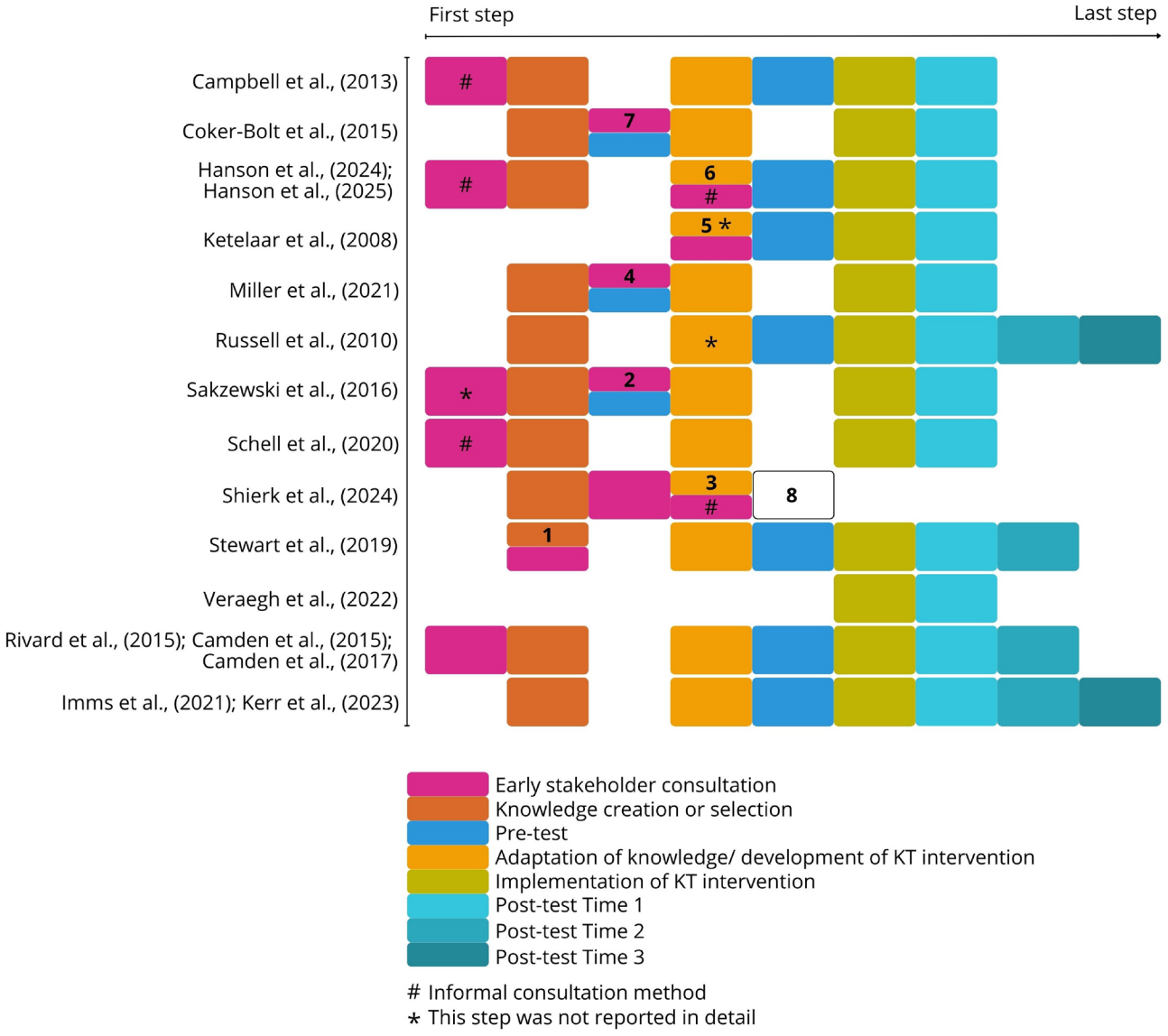

Fig. 3 Steps' sequence of knowledge translation processes

sequence, second-to-last and last, respectively (n = 13). One KT processes is currently ongoing, and the reported steps do not include the future steps expected to be carried out [33].

Each colour corresponds to a category grouping of KT steps (1). A previous review helped to select knowledge but the selection has been specified based on a following stakeholder consultation (2). A second stakeholder consultation to assess EBP barriers took place concurrently with the pre-test (3). A second stakeholder consultation took place concurrently with the intervention development to ensure its alignment with results from the first consultation (4). The initial assessment of current state and needs, and the pre-test were assessed in the same survey (5). Knowledge was adapted before the first dissemination. Then, a stakeholder consultation informed another knowledge adaptation before implementation (6). Stakeholders were consulted concurrently with the KT intervention development to adjust it (7). The consultation about current practice and the pre-test was done in the same survey (8). The implementation is in progress.

Data collection timing

Only nine studies reported the KT intervention duration, which ranged from 2 h to 24 months (Table 3). If data were collected in the KT studies, it happened during an early stakeholder consultation (n = 10), and/or during a pre-test (n = 10), and/or during one (n = 8), two (n = 2), or three (n = 2) post-tests. Eight of the 13 KT initiatives included an early stakeholder consultation, a pre-test and a post-test. The post-test measures were taken during the KT intervention, and/or after the intervention from

Table 3 Timing of data collection

Study	Early stakeholder consultation	Pre-test	Post-test	Repeated Post-tests	Post-test < 1 month after intervention	Post-test > 1months and < 12 months after intervention	Post-test =/>12 months after intervention	Post-test during intervention	Intervention duration
Campbell et al. (2013)	X	X	X		X				8 weeks
Coker-Bolt et al. (2015)	X	X	X		X				5 days
Hanson et al. (2024) Hanson et al. (2025)	X	X	X		X				15 weeks
Ketelaar et al. (2008)	X	X	X				X		1 day
Miller et al. (2021)	X	X	X				X		?
Russell 2010		X	X	X	X	X	X		6 months
Sakzewski et al. (2016)	X	X	X				X		3 days
Schell et al. (2020)	X		X				X		?
Shierk et al. (2024)	X								?
Stewart et al. (2019)	X	X	X	X	X	X			?
Verhaegh et al. (2022)			X				X		16 weeks
Rivard et al. (2015) Camden et al. (2015) Camden et al. (2017)	X	X	X	X	X	X			2 h
Imms et al. (2021) Kerr et al. (2023)		X	X	X	X			X	24 months

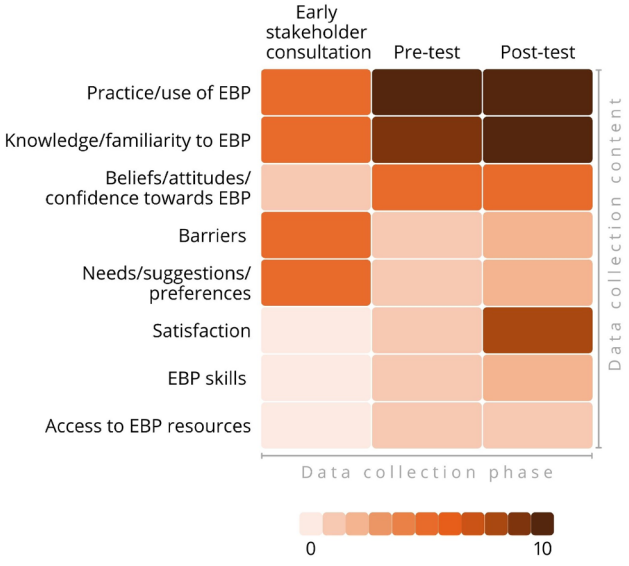

Fig. 4 Content of collected data

immediately after to more than a year after. The timing of data collection is detailed in Table 3 for each study.

Methods and content of pre/post-testing and stakeholders' consultation

The content of the data collected varied depending on both the specific study and the phase of data collection (Fig. 4). Data collected during an early stakeholder consultation phase were equally about knowledge and familiarity regarding EBP (n = 5), current use of EBP (n = 5), barriers to EBP (n = 5), needs, suggestions and preferences of stakeholders (n = 5), and beliefs, attitudes and confidence towards EBP (n = 1). Although not described in detail, additional early discussions with stakeholders were reported, conducted for purposes such as reaching consensus on specific rehabilitation intervention criteria [39], or reviewing a KT tool [29, 33]. During a pre-test phase, collected data were on EBP use (n = 10), knowledge and familiarity regarding EBP (n = 9), beliefs, attitudes and confidence towards EBP (n = 5), barriers to EBP (n = 1), needs, suggestions and preferences of stakeholders (n = 1), EBP skills (n = 1), and access to EBP resources (n = 1). During post-tests phases, collected data were on EBP use (n = 10), knowledge and familiarity regarding EBP (n = 10), satisfaction of stakeholder regarding the KT intervention (n = 8), beliefs, attitudes and confidence towards EBP (n = 5), needs, suggestions and preferences of stakeholders (n = 3), EBP skills (n = 2), and access to EBP resources (n = 1). Additionally, Hanson et al., [30] measured the self-reported intent to continue using the KT tool in the future during their post-test phase. The methods used to collect data differed across studies. Methods used to conduct the early stakeholder consultation were surveys (n = 4), semi-structured interviews (n = 3) and/or informal methods including informal interviews, meetings/discussions, and observations (n = 5). In pre-tests and post-tests data were collected through surveys (n = 10), semi-structured interviews (n = 2), and clinical reports analysis (n = 2). In most studies, the use of EBP was measured solely through self-report (n = 10). Only 2 KT initiatives used objective measures to capture changes in practice. In the KT process of Imms et al., [36] and Kerr et al., [37] EBP use was measured using clinical databases that objectively reflected clinicians' practices. Similarly, Sakzewski et al., [39] assessed EBP use through audits of medical records. Regarding stakeholder engagement, across the 13 KT initiatives, 7 relied exclusively on surveys or interviews. Only 6 described any form of iterative dialogue or co-creation activities with stakeholders [27, 29, 32, 33, 39, 40]. However in some of these cases, reporting was limited, and it was not possible to determine whether and how the discussions influenced decision-making within the KT process. More information on the co-creation aspects of KT initiatives can be found in Additional file 2.

Heatmap showing the number of studies collecting different types of data content during data collection phases: early stakeholder consultation, pre-test, and post-test phases. On the x-axis data collection phases are represented, on the y-axis types of data collection content is represented.

Discussion

This scoping review provides an overview of how KT processes are used to promote evidence-based motor rehabilitation for children with CP and DCD. We examined the sequence of stages and steps in KT processes, the theories informing them, and stakeholder engagement. Most studies reported using theories, although the same theory was rarely used across studies and theory application was only partially described. Furthermore, the included studies addressed a wide range of KT stages and steps, which were arranged in various sequences. Stakeholders were commonly engaged, mainly as respondents in early consultations and outcome assessments, with data collection methods and timing being heterogeneous. Specifically, self-reported measures of EBP knowledge and use were the most common. These findings offer important insights into KT operationalisation in paediatric rehabilitation and to identify opportunities for improvement.

Theoretical underpinnings

Our review shows that most studies applied a theory to guide their KT process, reflecting efforts to use evidence-informed approaches in paediatric rehabilitation. It aligns with best practice recommending theory use to enhance generalisability of findings, clarify the mechanisms of

change, and improve KT success [48]. However, only the KTA framework was used to inform the entire KT process. Other theories were applied only to individual steps, despite some (e.g., CFIR, Diffusion of Innovations) being intended to guide the entire KT process [49]. Our results highlight that theories were often applied selectively, with key steps left unsupported. Details on theory selection, application, and contribution to the intervention were scarce. This lack of clarity limits the replicability and interpretability of KT outcomes reported in CP and DCD rehabilitation. Our findings reinforce concerns that many KT theories lack guidelines for their application, contributing to superficial use and reporting [50]. Existing resources are valuable starting points to support more comprehensive selection and application of KT theories [51–53].

Consistently with the review of Strifler et al., [54] on chronic diseases management, we found that most KT theories were rarely reused across studies on CP and DCD motor rehabilitation, with only one of them appearing in multiple studies. This inconsistency in theory selection may hinder theoretical consolidation and comparability [55, 56]. The ongoing development of new theories, rather than validating existing ones, may block progress by promoting "pseudoinnovation" and conceptual confusion when the same ideas are rebranded under different names [57]. Our review highlights the need for prioritising systematic testing and refinement of established KT theories, models, and framework in paediatric motor rehabilitation contexts to move the field forward. This can facilitate the effective application of the whole KT process, ultimately enhancing rehabilitation outcomes for children.

To improve the application of theories in future KT processes (1), a theory should be applied in its entirety, covering all steps it is intended to guide, rather than selecting some of its components; (2) clear reporting on theory selection, application, and its contribution to the intervention is needed to enhance the replicability and interpretability of findings; and (3) the development of new theories should be avoided when established ones can serve the purpose, reducing conceptual confusion and promoting theoretical consolidation.

The steps' sequence of the KT process

Our findings show that a wide range of steps supporting the KT stages defined by Rabin et al., (2008) were addressed. It demonstrates the authors' awareness of key components in a KT process. Among them, stakeholder consultation and knowledge selection were steps taken at the knowledge creation stage. Adapting knowledge, designing and implementing the KT intervention were steps of the dissemination and implementation stages. Measurements activities supported the sustainability stage. While studies addressed most KT stages, the sustainability stage was often insufficiently addressed or introduced too early. Some studies assessed sustainability before enough time had passed to judge whether changes were truly maintained. For example, the longest sustainability assessment we identified was in Russell et al. (2010), which measured outcomes only one year post-intervention. Other studies had a single post-test more than a year after the intervention, but without an earlier post-test to confirm that change had occurred [35, 40]. These measurements could not be considered sustainability assessments. Several studies lacked baseline and post-intervention measurements, limiting the assessment of effectiveness. Inconsistent post-test timing and unclear intervention durations further complicated the interpretation of results. It was unclear whether observed outcomes were due to the KT intervention, the timing of assessment, or other contextual factors, which hinders replication and comparison across studies. Few studies evaluated outcomes beyond one year, leaving long-term effects uncertain. A more standardised measurement approach and stronger longitudinal designs are needed to better understand and support KT sustainability in paediatric motor rehabilitation.

This review shows that KT steps including the selection of knowledge to be implemented, KT intervention design and implementation, and post-testing were generally followed in the same order across studies. In contrast, the pre-testing and stakeholder consultation steps varied in timing, the latter occurring sometimes multiple times or alongside other steps. This suggests flexibility based on intervention context, supporting that following a preplanned and linear succession of steps is insufficient and iterative adjustments are needed for a successful KT [58, 59]. Future research should investigate why specific sequences are chosen in different paediatric rehabilitation contexts. This requires examining not just the sequence itself, but the underlying causal mechanisms connecting steps together and to outcomes [60–62]. We encourage authors to clearly explain their sequencing choices by highlighting the causal pathways they aim to activate and linking them to expected outcomes in rehabilitation settings. This points to a broader issue with reporting, as our data extraction has been affected by the use of inconsistent terminology, limited rationale for the KT process design and fragmented publications. This lack of clear reporting, combined with variation we identified in how authors approached KT, underscores the need for more standards in reporting KT actions. Consistent with observations in general healthcare, such standards would ensure better interpretations of results, replicability of interventions, and synthesis across KT studies in CP and DCD rehabilitation [63]. Existing reporting guidelines could support this effort [64].

Stakeholders' engagement in the KT process

Our results revealed that stakeholders were engaged sparingly in the KT processes. They were engaged at key points of the process, during pre/post-testing and in early consultations in order to report barriers to EBP or assess KT interventions' effectiveness. However, barriers to EBP were only measured prior to the implementation of KT interventions rather than afterwards, leaving stakeholders without the opportunity to reflect on whether the interventions effectively addressed those barriers. Overall, stakeholders' needs, preferences, suggestions, and satisfaction were assessed far less frequently than their knowledge and use of EBP, reflecting a focus on KT outcomes rather than on its process. This represents a missed opportunity for pragmatic measures that capture stakeholders' experiences of KT interventions, ensuring relevance and applicability beyond the research context [65]. Incorporating stakeholders' perspectives may enhance the long-term effect of KT interventions and promote the sustained use of EBP.

Our findings showed that stakeholders were mainly engaged as respondents primarily through surveys and structured interviews. This reflects an unidirectional dynamic driven by researchers, as stakeholders were treated primarily as data sources rather than partners. This dynamic would align with the Push model of Lavis et al., [15] which contrasts with the Pull model, where stakeholders would actively initiate contact with researchers and seek for knowledge based on their needs. The level of engagement corresponds to the "advice/feedback" level theorized by Petkovic et al., [62]. It implies that researchers consult stakeholders to consider their perspectives without them actively participating in the decision making. This higher engagement level of "decision-making" would necessitate a collaboration between researchers and stakeholders to co-produce the KT intervention while benefiting both groups equally. While recognising that contextual constraints may limit such collaboration, our review highlights the need for higher levels of stakeholder engagement for an integrated translation of evidence in CP and DCD motor rehabilitation.

Few studies in this review described stakeholder consultation as a dialogue with researchers. Those discussions were aimed at identifying research-practice gaps, understanding stakeholders' needs, or co-create a KT intervention. These bi-directional exchanges, often informal rather than limited to questionnaires or interviews, offer valuable experiences for future collaborations between researchers, clinicians and patients. However, missing details on how these discussions occurred and how they informed KT intervention development or decision-making, limit their usefulness. We hypothesise that this incomplete reporting may reflect publication standards, leaving parts of stakeholder engagement in KT processes undocumented. Furthermore, stakeholder engagement approaches varied widely across studies, which hinders comparability and obscures the link between stakeholder engagement processes and outcomes. Our findings in paediatric rehabilitation match broader calls for standardised reporting and context-specific guidelines for stakeholder-engaged research [56, 66, 67]. Existing evidence provides a basis for developing standardised engagement methods [68].

Implications for future research

This scoping review extends Hanson's review by moving beyond describing KT interventions and outcomes in CP rehabilitation to examining the entire KT process, including the intervention development and stakeholder engagement. Our extension focuses on three aspects. First, future research should continue this process-oriented approach by exploring the decision-making behind intervention design and the context-dependent mechanisms that drive KT outcomes. This can clarify not only what is done to translate evidence into paediatric motor rehabilitation (through description) but also why specific approaches are chosen and how change occurs (through causal explanation). Second, our review suggests that researchers face difficulties in applying theories to their full potential, comprehensively reporting KT interventions, and using standardised approaches to stakeholder engagement. Future research should explore researchers' experiences with translating evidence into paediatric motor rehabilitation to understand their challenges and provide better support. Third, this review reveals that clinicians and caregivers may have limited opportunities to actively engage in KT research. Yet, they play a critical role in translating evidence to inform clinical decisions in the care of children with CP and DCD. Research that learns from clinicians and caregivers' experiences and empowers them, following an Integrated Knowledge Translation approach of sustained researcher–stakeholder partnership, can strengthen KT in paediatric motor rehabilitation. To support this, investigating the perspectives of researchers, clinicians, and caregivers on their collaborative experiences can reveal constraints and opportunities for enhancing integrated knowledge translation.

Limitations

To our knowledge, this is the first review considering the entire processes used to translate research knowledge and evidence into motor rehabilitation for children with CP and DCD. At the same time, this review is subject to limitations. A research librarian facilitated the search process to reduce potential bias. However, inconsistencies in terminology across studies may still have limited the scope of the search, despite our efforts to iteratively

expand and refine search terms. Restricting eligibility to English, and focusing on peer-reviewed literature excluding conference abstracts may also have limited the retrieval of relevant studies. Additionally, differences in study approaches and the lack of standardised reporting may have affected how some KT actions were identified or interpreted. To mitigate this, the extraction form was first piloted on several studies and refined in consultation with a co-author. Although a single author initially conducted the full data extraction, all extracted data were independently verified by a second author, and uncertainties were resolved through discussion. As is standard in scoping reviews, the quality of included studies was not assessed. However, the review focused on the process of KT rather than evaluating their effectiveness. Finally, this review comprised a limited number of studies, predominantly taking place in high-income or privileged regions, which limits the generalisability of our findings.

Conclusion

This review reveals that translating evidence into motor rehabilitation for children with CP and DCD is a complex and unevenly operationalised process. While theory-informed KT is common, its selective and inconsistent use limits replicability and understanding of KT mechanisms at stake in paediatric rehabilitation contexts. KT steps are applied variably in number and sequence from the creation of evidence to the assessment of its implementation, and long-term outcomes remain underexplored. Clinicians and caregivers are commonly engaged in the process for consultation through surveys and structured interviews rather than co-production. This limits the potential of Integrated Knowledge Translation (IKT) and reduces the likelihood of sustained practice change. The diversity of KT approaches in paediatric motor rehabilitation offers a strong foundation for progress. Our review showed that while 14 studies referenced KT theories, only 10 described their application in sufficient detail to determine how they shaped the KT process. Future KT work would benefit from fully operationalising theory use, as well as adopting longitudinal designs, and applying standardised stakeholder engagement methods. A clearer reporting of decision-making within KT processes can foster shared learning across studies. Most importantly, while only one study employed an Integrated KT, following this IKT approach by engaging clinicians, patients, and caregivers as active partners, not just participants, will enhance both research quality and practical relevance of KT in motor rehabilitation for children with CP and DCD.

Abbreviations

CP Cerebral Palsy
DCD Developmental Coordination Disorder
EBP Evidence-Based Practice
IKT Integrated Knowledge Translation
KT Knowledge Translation

Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s12913-026-14488-0.

Supplementary Material 1

Supplementary Material 2

Acknowledgements

Not applicable.

Author contributions

LO, FVA and BS conceptualized and designed the review protocol. LO conducted the literature search, extracted and analysed data, and drafted the manuscript. FVA assisted with screening the literature and data extraction. FVA and BS substantively revised the manuscript. KK assisted with revising the manuscript and provided writing support. All authors read and approved the final manuscript.

Funding

This project has received funding from the European Union's Horizon Europe research and innovation programme under the Marie Sklodowska-Curie grant agreement No 101119878 – TReND, with additional support from UKRI Horizon Europe Guarantee (EP/Y033167/1) and from the Swiss State Secretariat for Education, Research and Innovation (SERI), Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency. Neither the European Union nor the granting authority can be held responsible for them.

Data availability

Not applicable.

Declarations

Ethics approval and consent to participate

Not applicable.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

Author details

[1]Behavioural Science Institute, Radboud University, Nijmegen, Netherlands
[2]Department of Rehabilitation Sciences, KU Leuven, Leuven, Belgium
[3]Rehabilitation Research Centre, Faculty of Rehabilitation Sciences, Hasselt University, Diepenbeek, Belgium

Received: 8 October 2025 / Accepted: 31 March 2026
Published online: 11 April 2026

References

1. McIntyre S, Goldsmith S, Webb A, Ehlinger V, Hollung SJ, McConnell K, et al. Global prevalence of cerebral palsy: A systematic analysis. Dev Med Child Neurol. 2022;64(12):1494–506. https://doi.org/10.1111/dmcn.15346.
2. Li H, Ke X, Huang D, Xu X, Tian H, Gao J, et al. The prevalence of developmental coordination disorder in children: a systematic review and meta-analysis. Front Pediatr. 2024;12:1387406.

3. Rosenbaum P, Paneth N, Leviton A, Goldstein M, Bax M, Damiano D, et al. A report: the definition and classification of cerebral palsy April 2006. Dev Med Child Neurol Suppl. 2007;109(suppl 109):8–14.
4. Schott N, Alof V, Hultsch D, Meermann D. Physical fitness in children with developmental coordination disorder. Res Q Exerc Sport. 2007;78(5):438–50. https://doi.org/10.1080/02701367.2007.10599444.
5. Steenbergen B, Valtr L, Dunford C, Prunty M, Bekhuis H, Temlali TY, et al. Awareness about developmental coordination disorder. Front Public Health. 2024;12:1345257.
6. Anaby D, Korner-Bitensky N, Steven E, Tremblay S, Snider L, Avery L, et al. Current rehabilitation practices for children with cerebral palsy: focus and gaps. Phys Occup Ther Pediatr. 2017;37(1):1–15. https://doi.org/10.3109/01942638.2015.1126880.
7. Camden C, Rivard L, Pollock N, Missiuna C. Knowledge to practice in developmental coordination disorder: impact of an evidence-based online module on physical therapists' self-reported knowledge, skills, and practice. Phys Occup Ther Pediatr. 2015;35(2):195–210. https://doi.org/10.3109/01942638.2015.1012318.
8. Pentland J, Maciver D, Owen C, Forsyth K, Irvine L, Walsh M, et al. Services for children with developmental co-ordination disorder: an evaluation against best practice principles. Disabil Rehabil. 2016;38(3):299–306. https://doi.org/10.3109/09638288.2015.1037464.
9. Saleh MN, Korner-Bitensky N, Snider L, Malouin F, Mazer B, Kennedy E, et al. Actual vs. best practices for young children with cerebral palsy: A survey of paediatric occupational therapists and physical therapists in Quebec, Canada. Dev Neurorehabilitation. 2008;11(1):60–80. https://doi.org/10.1080/17518420701544230.
10. World Health Organization. Bridging the know–do gap meeting on knowledge translation in global health. Geneva WHO. 2006.
11. Lizarondo L, Jordan Z, Linedale E, Lockwood C. Concept analysis of health research translation nomenclature. BMJ Open Qual [Internet]. 2025 [cited 2025 Dec 1];14(1). Available from: https://bmjopenquality.bmj.com/content/14/1/e002904.
12. Graham ID, Logan J, Harrison MB, Straus SE, Tetroe J, Caswell W, et al. Lost in knowledge translation: time for a map? J Contin Educ Health Prof. 2006;26(1):13–24.
13. Straus SE, Tetroe J, Graham I. Defining knowledge translation. CMAJ. 2009;181(3–4):165–8.
14. Rabin BA, Brownson RC, Haire-Joshu D, Kreuter MW, Weaver NL. A glossary for dissemination and implementation research in health. J Public Health Manag Pract. 2008;14(2):117–23.
15. Lavis JN, Lomas J, Hamid M, Sewankambo NK. Assessing country-level efforts to link research to action. Bull World Health Organ. 2006;84(8):620–8.
16. Graham ID, Kothari A, McCutcheon C. Moving knowledge into action for more effective practice, programmes and policy: protocol for a research programme on integrated knowledge translation. Implement Sci. 2018;13(1):22. https://doi.org/10.1186/s13012-017-0700-y.
17. Kothari A, Wathen CN. A critical second look at integrated knowledge translation. Health Policy. 2013;109(2):187–91.
18. Hanson J, Sasitharan A, Ogourtsova T, Majnemer A. Knowledge translation strategies used to promote evidence-based interventions for children with cerebral palsy: a scoping review. Disabil Rehabil. 2024;1–13. https://doi.org/10.1080/09638288.2024.2360661.
19. Ghahramani S, Larson SC, L'Hotta AJ, Harris KM, Lipsey K, Geng EH, et al. Education strategies are the most commonly used in pediatric rehabilitation implementation research: a scoping review. Implement Sci Commun. 2025;6(1):5. https://doi.org/10.1186/s43058-024-00690-w.
20. Campbell A, Louie-Poon S, Slater L, Scott SD. Knowledge translation strategies used by healthcare professionals in child health settings: an updated systematic review. J Pediatr Nurs. 2019;47:114–20.
21. Lazarowitz R, Taqi D, Lee C, Boruff J, McBain K, Majnemer A, et al. Knowledge translation interventions to increase the uptake of evidence-based practice among pediatric rehabilitation professionals: a systematic review. Phys Occup Ther Pediatr. 2025;45(2):119–52. https://doi.org/10.1080/01942638.2024.2421854.
22. Albrecht L, Scott SD, Hartling L. Knowledge translation tools for parents on child health topics: a scoping review. BMC Health Serv Res. 2017;17(1):686. https://doi.org/10.1186/s12913-017-2632-2.
23. Gagnon MM, Hadjistavropoulos T, Hampton AJ, Stinson J. A systematic review of knowledge translation (KT) in pediatric pain: focus on health care providers. Clin J Pain. 2016;32(11):972–90.
24. Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, et al. PRISMA extension for scoping reviews (PRISMA-ScR): checklist and explanation. Ann Intern Med. 2018;169(7):467–73. https://doi.org/10.7326/M18-0850.
25. Ouzzani M, Hammady H, Fedorowicz Z, Elmagarmid A. Rayyan—a web and mobile app for systematic reviews. Syst Rev. 2016;5(1):210. https://doi.org/10.1186/s13643-016-0384-4.
26. Pollock D, Peters MD, Khalil H, McInerney P, Alexander L, Tricco AC, et al. Recommendations for the extraction, analysis, and presentation of results in scoping reviews. JBI Evid Synth. 2023;21(3):520–32.
27. Campbell L, Novak I, McIntyre S, Lord S. A KT intervention including the evidence alert system to improve clinician's evidence-based practice behavior—a cluster randomized controlled trial. Implement Sci. 2013;8(1):132. https://doi.org/10.1186/1748-5908-8-132.
28. Coker-Bolt P, DeLuca SC, Ramey SL. Training paediatric therapists to deliver constraint-induced movement therapy (CIMT) in Sub-Saharan Africa. Occup Ther Int. 2015;22(3):141–51. https://doi.org/10.1002/oti.1392.
29. Hanson JH, Majnemer A, Pietrangelo F, Dickson L, Shikako K, Dahan-Oliel N, et al. Evidence-based early rehabilitation for children with cerebral palsy: co-development of a multifaceted knowledge translation strategy for rehabilitation professionals. Front Rehabil Sci. 2024;5:1413240. https://doi.org/10.3389/fresc.2024.1413240.
30. Hanson J, Majnemer A, Shikako K, Dahan-Oliel N, Pietrangelo F, Dickson L, et al. Implementation of a knowledge translation strategy to promote early evidence-based rehabilitation for children with cerebral palsy. Dev Med Child Neurol. 2025;dmcn70056. https://doi.org/10.1111/dmcn.70056.
31. Miller S, O'Donnell M, Mulpuri K. Physical therapists are key to hip surveillance for children with cerebral palsy: evaluating the effectiveness of knowledge translation to support program implementation. Phys Occup Ther Pediatr. 2021;41(3):300–13. https://doi.org/10.1080/01942638.2020.1851337.
32. Russell DJ, Rivard LM, Walter SD, Rosenbaum PL, Roxborough L, Cameron D, et al. Using knowledge brokers to facilitate the uptake of pediatric measurement tools into clinical practice: a before-after intervention study. Implement Sci. 2010;5(1):92. https://doi.org/10.1186/1748-5908-5-92.
33. Shierk A, Roberts H, Habeeb Y, Dursun N, Cekmece C, Bonikowski M, et al. Development of GO move: a website for children with unilateral cerebral palsy. OTJR Occup Ther J Res. 2024;44(4):589–96. https://doi.org/10.1177/15394492231225141.
34. Stewart K, De Vries T, Harvey A. Implementing accurate identification and measurement of dyskinesia in cerebral palsy into clinical practice: A knowledge translation study. J Paediatr Child Health. 2019;55(11):1351–6. https://doi.org/10.1111/jpc.14420.
35. Verhaegh AP, Nuijen NB, Aarts PB, Nijhuis-van Der Sanden MWG, Willemsen MA, Groen BE, et al. Parents' experiences with a home-based upper limb training program using a video coaching approach for infants and toddlers with unilateral cerebral palsy: a qualitative interview study. BMC Pediatr. 2022;22(1):380. https://doi.org/10.1186/s12887-022-03432-w.
36. Imms C, Kerr C, Bowe SJ, Karlsson P, Novak I, Shields N, et al. Efficacy of a knowledge translation approach in changing allied health practitioner use of evidence-based practices with children with cerebral palsy: a before and after longitudinal study. Disabil Rehabil. 2021;43(25):3592–605. https://doi.org/10.1080/09638288.2020.1727576.
37. Kerr C, Novak I, Shields N, Ames A, the Best Service Best Time Author Group, Imms C. Do supports and barriers to routine clinical assessment for children with cerebral palsy change over time? A mixed methods study. Disabil Rehabil. 2023;45(6):1005–15. https://doi.org/10.1080/09638288.2022.2046874.
38. Ketelaar M, Russell DJ, Gorter JW. The challenge of moving evidence-based measures into clinical practice: lessons in knowledge translation. Phys Occup Ther Pediatr. 2008;28(2):191–206. https://doi.org/10.1080/01942630802192610.
39. Sakzewski L, Ziviani J, Boyd RN. Translating evidence to increase quality and dose of upper limb therapy for children with unilateral cerebral palsy: a pilot study. Phys Occup Ther Pediatr. 2016;36(3):305–29. https://doi.org/10.3109/01942638.2015.1127866.
40. Schell S, Roth K, Duchow H. Developmental coordination disorder in Alberta: a journey into knowledge translation. Phys Occup Ther Pediatr. 2020;40(3):294–310. https://doi.org/10.1080/01942638.2019.1664704.
41. Rivard L, Camden C, Pollock N, Missiuna C. Knowledge to practice in developmental coordination disorder: utility of an evidence-based online module for physical therapists. Phys Occup Ther Pediatr. 2015;35(2):178–94. https://doi.org/10.3109/01942638.2014.985414.

42. Camden C, Rivard LM, Hurtubise K, Héguy L, Berbari J. Can a community of practice improve physical therapists' self-perceived practice in developmental coordination disorder? Phys Ther. 2017;97(7):746–55.
43. Michie S, Johnston M, Abraham C, Lawton R, Parker D, Walker A. Making psychological theory useful for implementing evidence based practice: a consensus approach. BMJ Qual Saf. 2005;14(1):26–33.
44. Michie S, Van Stralen MM, West R. The behaviour change wheel: A new method for characterising and designing behaviour change interventions. Implement Sci. 2011;6(1):42. https://doi.org/10.1186/1748-5908-6-42.
45. Damschroder LJ, Aron DC, Keith RE, Kirsh SR, Alexander JA, Lowery JC. Fostering implementation of health services research findings into practice: a consolidated framework for advancing implementation science. Implement Sci. 2009;4(1):50. https://doi.org/10.1186/1748-5908-4-50.
46. Fishbein M, Ajzen I. Belief, attitude, intention, and behavior: an introduction to theory and research [Internet]. 1977 [cited 2025 Oct 10]. Available from: https://philpapers.org/rec/FISBAI?all_versions=1.
47. Ajzen I. The theory of planned behavior. Organ Behav Hum Decis Process. 1991;50(2):179–211.
48. Nilsen P. Making sense of implementation theories, models, and frameworks. In: Albers B, Shlonsky A, Mildon R, editors. Implementation science 3.0 [Internet]. Cham: Springer International Publishing; 2015 [cited 2025 Jan 15]. p. 53–79. Available from: https://link.springer.com/10.1007/978-3-030-03874-8_3. https://doi.org.10.1007/978-3-030-03874-8_3.
49. Esmail R, Hanson HM, Holroyd-Leduc J, Brown S, Strifler L, Straus SE, et al. A scoping review of full-spectrum knowledge translation theories, models, and frameworks. Implement Sci. 2020;15(1):11. https://doi.org/10.1186/s13012-020-0964-5.
50. Wang Y, Wong ELY, Nilsen P, Chung VC, ho, Tian Y, Yeoh EK. A scoping review of implementation science theories, models, and frameworks — an appraisal of purpose, characteristics, usability, applicability, and testability. Implement Sci. 2023;18(1):43. https://doi.org/10.1186/s13012-023-01296-x.
51. Lynch EA, Mudge A, Knowles S, Kitson AL, Hunter SC, Harvey G. There is nothing so practical as a good theory: a pragmatic guide for selecting theoretical approaches for implementation projects. BMC Health Serv Res. 2018;18(1):857. https://doi.org/10.1186/s12913-018-3671-z.
52. Moullin JC, Dickson KS, Stadnick NA, Albers B, Nilsen P, Broder-Fingert S, et al. Ten recommendations for using implementation frameworks in research and practice. Implement Sci Commun. 2020;1(1):42. https://doi.org/10.1186/s43058-020-00023-7.
53. Fontaine G, Mooney M, Porat-Dahlerbruch J, Cahir K, Ellen M, Spinewine A, et al. Advancing the selection of implementation science theories, models, and frameworks: a scoping review and the development of the SELECT-IT meta-framework. Implement Sci. 2025;20(1):24. https://doi.org/10.1186/s13012-025-01436-5.
54. Strifler L, Cardoso R, McGowan J, Cogo E, Nincic V, Khan PA, et al. Scoping review identifies significant number of knowledge translation theories, models, and frameworks with limited use. J Clin Epidemiol. 2018;100:92–102.
55. Damschroder LJ. Clarity out of chaos: use of theory in implementation research. Psychiatry Res. 2020;283:112461.
56. Wensing M, Grol R. Knowledge translation in health: how implementation science could contribute more. BMC Med. 2019;17(1):88. https://doi.org/10.1186/s12916-019-1322-9.
57. Walshe K. Pseudoinnovation: the development and spread of healthcare quality improvement methodologies. Int J Qual Health Care. 2009;21(3):153–9.
58. Albers B, Mildon R, Lyon AR, Shlonsky A. Implementation frameworks in child, youth and family services–Results from a scoping review. Child Youth Serv Rev. 2017;81:101–16.
59. May CR, Johnson M, Finch T. Implementation, context and complexity. Implement Sci. 2016;11(1):141. https://doi.org/10.1186/s13012-016-0506-3.
60. Lewis CC, Boyd MR, Walsh-Bailey C, Lyon AR, Beidas R, Mittman B, et al. A systematic review of empirical studies examining mechanisms of implementation in health. Implement Sci. 2020;15(1):21. https://doi.org/10.1186/s13012-020-00983-3.
61. Geng EH, Powell BJ, Goss CW, Lewis CC, Sales AE, Kim B. When the parts are greater than the whole: how understanding mechanisms can advance implementation research. Implement Sci. 2025;20(1):22. https://doi.org/10.1186/s13012-025-01427-6.
62. Proctor EK, Bunger AC, Lengnick-Hall R, Gerke DR, Martin JK, Phillips RJ, et al. Ten years of implementation outcomes research: a scoping review. Implement Sci. 2023;18(1):31. https://doi.org/10.1186/s13012-023-01286-z.
63. Powell BJ, Fernandez ME, Williams NJ, Aarons GA, Beidas RS, Lewis CC, et al. Enhancing the impact of implementation strategies in healthcare: a research agenda. Front Public Health. 2019;7:3.
64. Pinnock H, Barwick M, Carpenter CR, Eldridge S, Grandes G, Griffiths CJ, et al. Standards for reporting implementation studies (StaRI): explanation and elaboration document. BMJ Open. 2017;7(4):e013318.
65. Powell BJ, Beidas RS, Lewis CC, Aarons GA, McMillen JC, Proctor EK, et al. Methods to improve the selection and tailoring of implementation strategies. J Behav Health Serv Res. 2017;44(2):177–94. https://doi.org/10.1007/s11414-015-9475-6.
66. Petkovic J, Magwood O, Lytvyn L, Khabsa J, Concannon TW, Welch V, et al. Key issues for stakeholder engagement in the development of health and healthcare guidelines. Res Involv Engagem. 2023;9(1):27. https://doi.org/10.1186/s40900-023-00433-6.
67. Martinez J, Wong C, Piersol CV, Bieber DC, Perry BL, Leland NE. Stakeholder engagement in research: a scoping review of current evaluation methods. J Comp Eff Res. 2019;8(15):1327–41. https://doi.org/10.2217/cer-2019-0047.
68. Ray KN, Miller E. Strengthening stakeholder-engaged research and research on stakeholder engagement. J Comp Eff Res. 2017;6(4):375–89. https://doi.org/10.2217/cer-2016-0096.

Publisher's note