Educating rehabilitation professionals on clinical skills for postural care services: A scoping review

Faye E McGuire ⬤, Jennifer Hutson ⬤ and Hannah Oldenburg

Abstract

Background: This scoping review aims to identify evidence-based practices for educating rehabilitation professionals who provide assistive technology interventions, specifically night-time postural care, to children with cerebral palsy.

Methods: A review of both peer-reviewed and grey literature published between 2000 and 2021 was undertaken in June 2021. The articles were analyzed using a process outlined by Arksey and O'Malley in 2005: scanning abstracts, completing initial and critical reviews, collating and summarizing data into themes.

Results: The search resulted in 15 articles, predominantly from the United Kingdom and the United States: 10 primary research, two reviews, two conceptual/theoretical, and one gray-literature source. Four themes emerged (1) Successful service delivery required competence, (2) Benefits of incorporating practice, collaboration, and feedback, (3) Effective online education through multifactorial approaches, (4) Considering different learning requirements among team members.

Conclusions: There's beginning evidence that rehabilitation professionals' competence with night-time postural care might be achieved via active, interactive, multi-factorial online training.

Keywords

Cerebral palsy, postural care, rehabilitation, assistive technology, training

Introduction

Rehabilitation professionals recommend the use of assistive technologies such as sleep positioning systems to provide whole-body alignment and affect the health and well-being of those with severe cerebral palsy (CP).[1–2] CP is the most common childhood motor disability and those with severe cerebral palsy have challenges with movement which means they often rest in asymmetrical postures.[3] Because asymmetrical lying postures lead to body shape distortions,[4] rehabilitation professionals seek interventions like night-time postural care (NTPC) to not only address alignment, but also affect other persistent and pervasive problems associated with CP: pain and sleep disruption.[1,2,4–8] When NTPC is correctly applied, rehabilitation professionals use an arrangement of supportive components (e.g., specially designed pillows, cushions, brackets) to position individuals so they can rest comfortably. The combined complexity of the conditions associated with CP along with this application of assistive technology makes it challenging for rehabilitation professions to achieve desired intervention outcomes. These outcomes might best be achieved when

Occupational Therapy, St Catherine University, St. Paul, MN, USA

Corresponding author:
Faye E McGuire, Occupational Therapy, St Catherine University, 2004 Randolph Ave, St Paul, MN 55105, USA.
Email: femcguire274@stkate.edu

standardized training protocols are used to educate rehabilitation professionals in NTPC implementation.[1,9–10]

Limited knowledge about how to best carry out NTPC interventions has the potential to negatively affect clinical practice and intervention research outcomes. Research shows that professionals addressing postural needs have insufficient knowledge about 24-h postural management, especially night-time positioning and this knowledge deficit hinders their ability to recognize postural problems, refer patients to appropriate services, understand the purpose of postural care, and incorporate postural care management into their practice.[11] In addition, differently formatted training programs have been shown to result in differences in both self-perceived competence and potential for self-assessing actual positioning ability post-training.[10] In order for health professionals to gain the necessary skills for implementing NTPC and have an effect on the health of those served, we need to understand which educational practices are most effective.

While previous scoping reviews about NTPC have examined other aspects of service delivery (e.g., sleep-based assessment, best practices for evaluation and provision, client perspectives, and outcomes related to equipment), none to our knowledge have specifically examined best practices for educating rehabilitation professionals on sleep-system technologies.[2,12–14] As a result there's no consensus regarding the training methods that'll lead to effective NTPC implementation for children with CP and impaired mobility. To fill this knowledge gap and gain a better understanding of what it takes to effectively train rehabilitation professionals for NTPC implementation, our scoping review addresses the following question: What evidence-based practices can be used to guide the NTPC education of rehabilitation professionals serving children with CP and impaired mobility?

Methods

Investigators applied the Arksey and O'Malley framework (2005) to this scoping review which involved mapping out key concepts, exploring existing evidence, identifying gaps in knowledge, and analyzing disseminated information.[15] Investigators completed the following steps throughout the scoping review process: identify the research question, identify relevant articles, select articles, analyze articles (scan abstracts, conduct initial and critical reviews, and collate and summarize data). While one investigator completed the review of the literature, a peer review process was employed throughout each step to ensure rigor.

Literature search process

One investigator searched for primary evidence (qualitative, quantitative, mixed methods studies) that addressed methods of educating rehabilitation professionals on postural care, using CINAHL Plus Full Text and ERIC in June 2021 using Boolean phrases and overarching terms such as postural care, healthcare professionals, training, healthcare education, and methods (Table 1). Search terms and term combinations were compiled and updated throughout the search process to reflect the language used in the relevant literature. Limitations in search parameters included: written in English language, scholarly peer-reviewed journals, free full-text, searching in the title or abstract, and removing the term *standing* from search parameters. The investigator first restricted the search to articles published within the last 5 years and then progressively expanded the search to 10, 15, and then 20 years as a means of capturing the most relevant literature, including seminal publications.

The investigator also conducted a secondary search of gray literature to identify greater breadth and depth of data by conducting a keyword search via Google Scholar (scholar.google.com), American Journal of Occupational Therapy (ajot.aota.org), and scanning reference lists of relevant articles. For the first two gray literature searches mentioned, the investigator restricted the search to locate resources published within the last 10 years and written in English. Lastly, the investigator reviewed reference lists of articles selected for initial appraisal in the database search.

Selection and organization process

During the initial search process, the investigator screened articles by title and abstract and determined their eligibility. The investigator chose articles for full review based on quality and type of evidence (e.g., qualitative and quantitative methodology), relevance to the scoping review question, and whether a peer-review process was utilized by the publisher.

Articles were considered relevant to this review if they addressed the following content areas: educational methods for developing clinical skills or postural care services, theoretical frameworks for educating healthcare professionals/students, or current practices related to healthcare professionals' training and knowledge on NTPC (Table 2). Articles were excluded from this review if they involved non-empirical research, reported incomplete trials, or focused primarily on NTPC intervention rather than education methods (Table 2).

Article analysis, charting, and summarization

After selecting the articles that met inclusion criteria, the investigator conducted an analysis that included both initial and critical appraisals. The investigator conducted initial appraisals using templates which consisted of the following

Table 1. Specific search terms.

Topic or focus	Terms
Population	Cerebral palsy, neurodisability
Intervention	Night-time postural care, posture, postural management, posture management, cerebral palsy, neurodisability
Stakeholders	Healthcare professionals, healthcare workers, healthcare providers, allied health professionals, multidisciplinary team, therapist, occupational therapist, physical therapist, rehabilitation professional
Education or training	Knowledge, education, training, training program, healthcare education, education, educational methods, skills, confidence, advanced skills, clinical skills, best practice, evidence based practice, methods, techniques, strategies, continuing education, professional development, continuing professional education, teaching, learning, and pedagogy

Table 2. Literature inclusion and exclusion criteria.

Inclusion criteria	Exclusion criteria
Educational methods for developing clinical skills or postural care services	Involved non-empirical research
Theoretical frameworks for educating healthcare professionals/students	Reported incomplete trials
Current practices related to healthcare professionals' training and knowledge on NTPC	Focused on NTPC intervention rather than education methods

Note. NTPC = Nighttime postural care.

categories: publisher's integrity, quality of research, and relevance to the scoping review question (Supplementary Appendix A). The appraisal templates were used to guide the investigator's review and organization of published articles. The investigator conducted a more in depth, or critical appraisal, via a process called collation,[15] which involved gathering numerical data across articles on criteria such as research design, source of literature, content relevant to the scoping review question, year of publication, population, country of origin, setting, and intervention (Supplementary Appendix A). The primary investigator categorized, charted, and stored articles with considerations of methodology, stakeholders, and types of interventions. All articles were organized and stored in a Microsoft Word document and formatted within a table and annotated bibliography.

To develop themes, the primary investigator noted content relevant to the research question from each article, grouped each note into categories based on similar content topics and reviewed the commonality of content in each category. Then the investigator reread the articles and made any necessary changes. Finally, the investigator named each category or theme. Theme content and names were adjusted and/or confirmed by the two other investigators.

Throughout this process the main investigator collaborated with secondary investigators regarding the scoping review methodology and accuracy of themes. Several virtual meetings to review procedure of literature search, theme development, and summarization of the articles were completed over a 6-week timeframe.

Results

The primary evidence search yielded 175 articles, of which 16 were eligible for full review, and 10 met inclusion/exclusion criteria (Figure 1). The gray literature search yielded 843 resources, of which 18 were assessed for eligibility, and five met inclusion/exclusion criteria (Figure 1). Thus, the investigator included 15 articles for full review.

A breakdown of the findings related to manuscript type, evidence level, type of appraisal, and component of the scoping review question addressed by each individual article can be found in Table 3. Of the 15 articles included in the review, 10 were primary research, two were systematic reviews, two were conceptual/theoretical papers, and one source was gray literature. The articles ranged in evidence from level II (RCT) to level VI (single descriptive)[16] with two primary research articles and one systematic review being examined according to the critical appraisal process. Each article addressed one of three components considered relevant to our scoping review question (educational methods for healthcare, postural care training needs in practice, or development and/or effectiveness of postural care training programs), with most addressing educational methods related to hands-on clinical skills ($n = 9$).

While no one article addressed the entirety of the research question, the 15 articles collectively provide information about evidence-based methods for educating rehabilitation professionals and postural care training. Of the 15 articles, nine explore educational methods considered beneficial for teaching rehabilitation professionals/students clinical practice skills.[17–25] Two articles examine the current
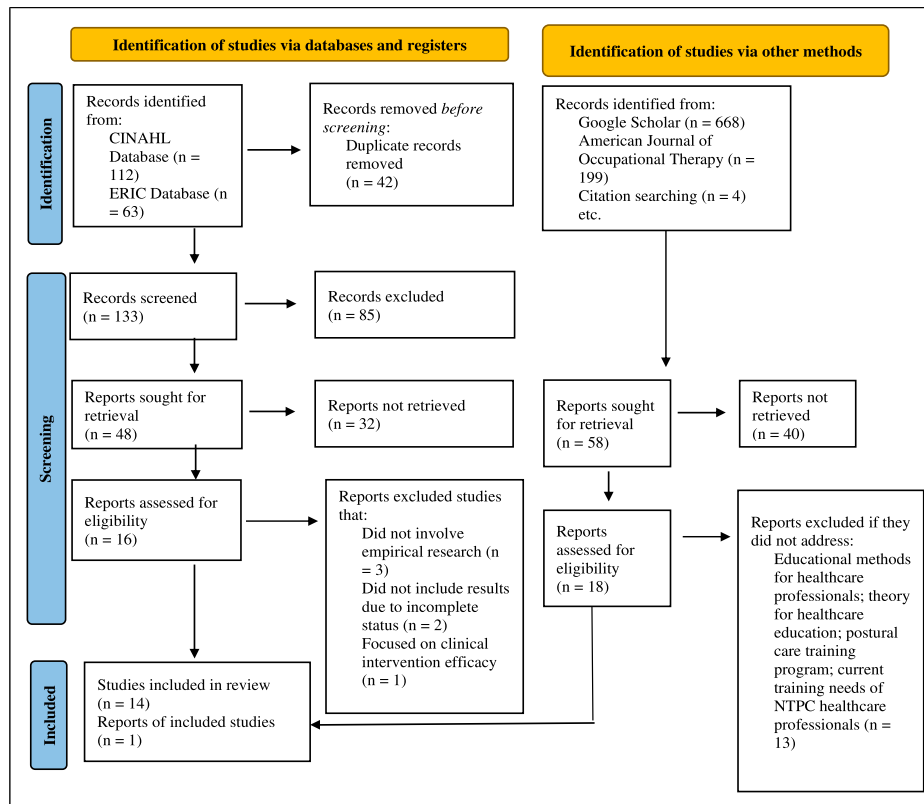
Figure 1. Flow diagram for search and selection process using databases and alternative search strategies. *Note.* Figure is adapted from PRISMA template for new systematic reviews which included searchers of databases, registers, and other sources (From: Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ 2021;372:n71. doi: 10.1136/bmj.n71.)

postural care training needs for clinical practice.[9,11] Two articles describe the development or effectiveness of a postural care training program for parents, school staff, and nurses.[26–27] Two examine and evaluate specific postural care training programs intended for both parents and rehabilitation professionals.[10,28] No articles specifically addressed best strategies for training NTPC professionals serving children with severe CP.

Of the 15 articles, nine were published between 2016 and 2021. The 15 articles were published primarily within the disciplines of allied health, rehabilitation, healthcare education, and higher education. A majority of the 15 articles represented work from the United Kingdom ($n = 6$) and the United States ($n = 4$). The 10 primary research studies took place in five different countries.[9–11,17,18,20,21,23,25,27] Six primary research studies were conducted at an academic institution,[10,17,18,20,25,27] and four were conducted at a healthcare institution.[9,11,21,23] The five publications that did not fall into the category of primary research (e.g. systematic reviews, conceptual/theoretical articles, and gray literature) represented work completed across five countries.[19,22,24,26,28]

The 15 articles employed the following research designs RCT ($n = 1$), non-RCT ($n = 2$), single-subject design ($n = 5$), exploratory ($n = 2$), systematic review ($n = 2$), conceptual/theoretical articles ($n = 2$), and gray literature ($n = 1$). In the RCT, researchers examined the effectiveness of online NTPC training.[10] In the two non-RCT publications, researchers examined occupational therapy educational curriculum[20] and a group mentorship program between new and experienced pediatric occupational therapists.[21] The five single-subject design descriptive studies addressed teaching methods for healthcare students and professionals,[17,18,23,25] and postural care training for caregivers.[27] In the exploratory studies, researchers examined perspectives related to postural care of multidisciplinary team members and service users/caregivers.[9,11] The systematic reviews analyzed 16–19 studies related to educational methods for healthcare professionals.[19,22]

Finally, the conceptual/theoretical articles and gray literature address the development and evaluation of postural care training[26,28] and a theoretical model for healthcare student education.[24]

Four key themes emerged during review: successful service delivery requires competence; benefits of

Table 3. Author, title, article type, and scope of articles included in critical review.

Author	Overall article type	Specific article type (Level of evidence)	Type of appraisal	Part of the question[a]
Baird et al.[17]	Primary research study (Quantitative)	Single-subject design (Level VI)	Initial	1
Boucaut and Howson[18]	Primary research study (Mixed-methods)	Single-subject design (Level VI)	Initial	1
Carroll et al.[19]	Review of research study	Systematic review of primary research (Level V)	Initial	1
Castle et al.[9]	Primary research study (Mixed-methods)	Descriptive/exploratory research (Level VI)	Initial	2
de Aguiar and Oliveria[26]	Conceptual/theoretical article	Methodological development research	Initial	3
Hill[28]	Gray literature	Program evaluation report	Initial	3
Hotham et al.[27]	Primary research study (Mixed-methods)	Single-subject design (Level VI)	Critical	3
Hutson et al.[10]	Primary research study (Mixed-methods)	Randomized controlled trial (Level II)	Critical	3
Jay and Owen[20]	Primary research study (Quantitative)	Non-randomized, controlled trial (Level III)	Initial	1
King et al.[21]	Primary research study (Mixed-methods)	Non-randomized controlled trial (Level III)	Initial	1
McCall et al.[22]	Review of research study	Overview of systematic reviews (Level V)	Critical	1
Pittman and Lawdis[23]	Primary research study (Mixed-methods)	Single-subject design (Level VI)	Initial	1
Stinson et al.[11]	Primary research study (Mixed-methods)	Descriptive/exploratory research (Level VI)	Initial	2
Tolks et al.[24]	Conceptual/theoretical article	Practical guide	Initial	1
Zaghab et al.[25]	Primary research study (Quantitative)	Single-subject design (Level VI)	Initial	1

Note. The Level of Evidence is based on the Level I-VII Evidence Pyramid.[16]
[a]Number corresponding to the heading entitled "Part of the Question" refers to which aspect of or component considered relevant to the scoping review question that was addressed by the identified article: 1 = educational methods for healthcare clinical skills; 2 = postural care training needs in practice; 3 = development and/or effectiveness of a postural care training program.

incorporating practice, collaboration, and feedback; effective online education through multifactorial approaches; and considering different learning requirements among team members. The above-stated themes collectively emerged during the categorization and theme identification process across all 15 articles. While most of the articles addressed two of the four themes (n = 9),[9,11,17,20–23,25,26] the remaining articles individually addressed four (n = 1),[10] three (n = 3),[19,24,27] or one (n = 2)[18,28] of the themes.

Key themes

Theme 1: Successful service delivery requires competence. Eleven studies addressed the importance of competence (e.g., knowledge, understanding, confidence) when developing postural care service delivery skills.[9–11,17,19–21,23–25,27] Two of these publications were exploratory studies that examined the

current knowledge of professionals and non-professionals.[9,11] One publication was a systematic review that revealed techniques for building competence for online healthcare education, and one was a theoretical/conceptual paper that highlighted the importance of following lower-to higher-order progression to increase competence among healthcare professionals.[19,24] The remaining seven publications were original research that examined changes in participants' competence after completing specifically designed training or educational programs.[10,17,20,21,23,25,27] Out of these seven, four were single-subject designs, two were non-randomized controlled trials, and one was a randomized controlled trial. While most of these studies revealed the importance of building competence in healthcare clinical skills, two examine competence specific to postural care education. For example, in the study by Hotham et al.,[27] parents and school staff (n = 75) completed a two-hour in-person postural care training workshop with follow-up, and they found participants'

competence significantly improved ($p < .001$) and concerns significantly decreased ($p < .001$).[27] In an experimental study by Hutson et al.,[10] investigators included participants identified as both health professionals and non-professional caregivers. These participants completed a two-hour online training program that included content on night-time postural care evidence, risk-factor monitoring, sleep-system types, positioning methods, and assessments and investigators found that self-perceived competence increased significantly more than the control group (0.46 points, SE = 0.17, $p = .008$).[10] While there's consensus that skill competence is important, these studies reveal the methods that might lead to perceived feelings of competence for rehabilitation professionals when receiving training about postural care.

Theme 2: Benefits of incorporating practice, collaboration, and feedback. Eleven studies specified the types of interactive and active learning approaches that can be used to increase factors such as clinical reasoning, confidence, and skill transfer among healthcare professionals.[10,17–22,24–27] Examples of these approaches include practice (i.e., simulations, case studies, practice coaching, kinesthetic activities, and demonstrations), collaboration (i.e., mentorship, group discussion, problem-based learning, think-pair-share, and peer-teaching), and/or feedback (i.e., reflection, debrief, digital-recording review, written/verbal feedback from instructors/peers, learning checkpoint quizzes, intermittent click-drag exercises, and final exam assessment).[10,17–22,24–27]

Out of the 11 articles, two were systematic reviews and two were theoretical/conceptual papers that described how collaboration and feedback benefitted learners by supporting and validating their knowledge.[19,22,24,26] The remaining seven publications (four single-subject designs, two non-randomized controlled trials, and one randomized controlled trial) involved original research that examined the effectiveness of training which incorporated practice, collaboration, and/or feedback.[10,17,18,20,21,25,27] In one of these studies, occupational therapy students participated in a hands-on simulation followed by verbal and visual feedback to develop transfer skills for medically complex patients.[17] They found that students accurately completed 66–88% of transfer tasks post-intervention.[17] In the randomized controlled study, investigators compared the effectiveness of an interactive NTPC online training program to a self-directed online module.[10] The interactive module, which provided intermittent checkpoints as feedback, was associated with significantly increased self-perceived competence (0.46 points, SE = 0.17, $p = .008$).[10] These studies suggest that interactive and active learning methods may enhance postural care learning outcomes.

Theme 3: Effective online education through multifactorial approaches. Six studies indicated education for rehabilitation professionals could be effectively achieved using online methods.[10,19,22–24,26] Collectively these studies addressed ways to best design online education and use multifactorial approaches (e.g., text, images, videos, audio, games) to support skill integration and diverse learning styles.[10,19,22–24,26] Two of these articles were systematic reviews that highlight how online education affords flexibility, accessibility, independence, and the ability for learners to self-pace and that when delivered using multifactorial approaches (i.e., audio, visual, and text) is preferred.[19,22] Two conceptual/theoretical papers discussed online course design considerations such as limiting video length to 10–20 min, including goal-oriented learning objectives, and providing multimedia reference materials as a supplement to content delivered online (e.g., PDF of video slides).[24,26] The remaining two publications contained original research examining the effectiveness of a specifically designed online training program using multifactorial approaches. For one of these studies, 17 healthcare practitioners participated in a 6-week multifactorial online training program. Investigators found that 94% of participants perceived the multifactorial training program to be *very effective* and valuable in increasing competence, and 70% of participants reported having benefited from each of the multifactorial approaches.[23] In other studies, investigators identified the importance of incorporating videos into the multifactorial training, as means of supporting the preferences and comprehension of visual learners.[10,19,23] Overall, there was consistency across authors in support of using multifactorial approaches in online education to enhance learning outcomes.

Theme 4: Considering different learning requirements among team members. Four primary studies and one program evaluation report suggested that learning requirements differed across team members on postural care competence outcomes.[9–11,27,28] Two of these studies were descriptive/exploratory in which both caregivers and multidisciplinary team members reported dissatisfaction and a lack of overall knowledge due to the amount of postural care training they received.[9,11] Another study identified knowledge differences that occur across disciplines such that nurses and occupational therapists reported having more knowledge than speech therapists and psychologists.[9] One single-subject design and one experimental study showed that that postural care training programs for parents and teachers have a positive impact, but parents and teachers may need additional training compared to professionals.[10,27] For example, Hotham et al.[27] designed a postural care training program and found that reassurance, encouragement, and discussing concerns were beneficial. Hutson et al.[10] also found that a two-hour interactive NTPC training program improved caregivers' competence and skills, but they correctly completed significantly fewer positioning tasks

compared to professionals who completed the same training (F(1, 92.34) = 16.62, $p < .0001$). Thus, evidence suggests that the learning requirements of different team members may require different types and/or amounts of postural care training to achieve competence.

Discussion

This scoping review provides beginning evidence that: educators can best train rehabilitation professionals in postural care if they aim to (1) increase competence for successful service delivery, (2) incorporate opportunities for practice, collaboration, and feedback, (3) design online education with multifactorial approaches, and (4) consider different learning needs among team members. Strengths of the review included the investigator's strategic search process (inclusion and exclusion process), storage and re-view of literature, and synthesis of the most current liter-ature within the last 12 years.

While the existing literature gives insights into how professionals can best be trained in postural care, our scoping review finds a gap in the literature as it relates to NTPC training for professionals that's specifically oriented towards those serving children with CP or impaired mo-bility. The search process revealed a lack of research on the topic due to a variety of factors relating to NTPC such as limited clinical evidence, poor implementation and utili-zation in practice, new introduction in some countries (e.g., United States), all of which results in limited awareness, and limited availability of training programs for rehabilitation professionals. Since research on the topic of NTPC is in its infancy, education specific to children with severe CP or impaired mobility is minimal. Thus, readers should rec-ognize that some of the themes revealed in this scoping review may be less applicable than others to that population.

The investigator identified issues exist related to the quality of evidence included in this scoping review. For instance, many of the studies were of low quality due to design, sampling, outcome measures, and procedural limitations. Many studies were descriptive, used non-probability sampling, and either did not report cultural demographics or lacked diversity, limiting generalizability.[9–11,17,18,23,25,27] In addition, self-created and self-report outcome measures were common, and researchers often failed to report replicable methodology for the procedure, data collection, and data analysis.[10,11,17,18,20,21,23] These investigators have laid the groundwork for knowledge on the topic of ed-ucational methods for rehabilitation professionals, and future investigators can learn from them as they advance the quality of research moving forward.

Future work

Future investigators could advance the literature around NTPC education best practices by further examining the clinical skills directly needed for NTPC implementation, the type of training needed to support those identified skills, and the overall amount/dosage of such training. Several articles in the review addressed clinical skills training such as transfers, patient handling, or clinical assessment rather than NTPC specific training.[17,18,20] Also, several researchers suggest that practice and feedback enhance learning out-comes, but the literature does not address the quantity of practice and the type of feedback for optimal results.[10,17,20,25] Finally, the literature lacks a clear rec-ommendation on the delivery of education. While some research indicates online healthcare education has a com-parable effect to traditional education,[22] other research suggests that exclusively online modules for positioning are not sufficient for the transfer of knowledge.[10,18] Online postural care training may be adequate to achieve compe-tence for rehabilitation professionals with previous knowledge and experience in positioning, but new practi-tioners with less experience related to positioning may require hands-on training to reinforce skills. In order to develop specific recommendations for NTPC training protocols, the examination of the type and amount of training required to gain competence in NTPC clinical skills is necessary.

There seems to be some consensus that NTPC education should be designed to meet learners' needs based on their designated role; however, there is little evidence about how that training should differ across team members. Further, no studies have examined whether training protocols should differ based on one's level of expertise within a particular role. Some postural care training programs that included both parents and professionals and/or teachers found dif-ferent outcomes across groups and reported that parents may need more extensive training than professionals, and parents or teachers may benefit from additional opportu-nities for hands-on practice, collaboration, and feedback to achieve same levels of skill.[10,27] These findings suggest that it may be important to consider not only the person's role but also their previous experience. Future investigators could advance our understanding of best practices for ed-ucating rehabilitation professionals by comparing the out-comes of educational interventions based on levels or years of experience and go a step further in discriminating the protocols necessary across team member roles.

Implications

There are broad implications supported from the findings of this scoping review as it relates to ways of educating re-habilitation professionals on NTPC. Despite the potential therapeutic benefits of NTPC for children with CP and impaired mobility, there is a need for improved training opportunities to educate rehabilitation professionals. Given limited training opportunities for professionals, even those

actively involved in providing NTPC services may not have appropriate knowledge and skills.[11] The methods and considerations of NTPC education identified in this review could be used to inform future training programs. Improved training could ultimately result in more competent therapists and better service delivery as increased knowledge and skills among occupational therapists have been associated with more frequent intervention utilization, advancing rehabilitation services for children with CP and impaired mobility.[11] In addition to practice implications, the findings from this review may lead to higher-quality research on NTPC. Namely, this overview may influence the development of standardized and effective training protocols for clinical studies. High-quality research will ultimately promote the widespread implementation of NTPC into practice.

The findings from this review coupled with previous literature suggest the importance of considering the competence of learners. Those developing training programs may want to identify competence as a goal of NTPC educational programs for rehabilitation professionals. While increasing knowledge and skill is vital to implementing evidence-based interventions, self-efficacy has also been found to influence the quality of service delivery.[23,25] For educators wanting to advance learners' competence, there's also evidence to suggest that such learning occurs developmentally with rehabilitation professionals progressing from lower-order to higher-order knowledge acquisition.[23,25] Lower-order cognitive skills refer to knowledge and comprehension, whereas high order cognitive skills refer to analysis, synthesis, and evaluation.[24] This implies that developers must first present factual information before addressing professionals' clinical reasoning skills. Since competence is a vital consideration for developing postural care training programs, the educators may want to utilize evidence-based methods to achieve increased learner competence.

The findings also suggest that including hands-on practice, collaboration, feedback, and multifactorial online approaches improve the effectiveness of education for rehabilitation professionals.[17,19,20,22,23,25] One way to implement these elements may be to design a video-based module (supplemented by text and images) followed by a group workshop for nonprofessionals with opportunities to practice positioning using equipment and exchange verbal feedback. Through such a program, learners would have the chance to gain basic knowledge independently at their own pace, and then discuss concerns, reinforce their skills, and assimilate knowledge. Ultimately, these methods, informed by scoping review findings, would enhance competence among rehabilitation professionals delivering NTPC.

Limitations

Limitations exist related to the scoping review process. Investigators did not use a standardized tool to evaluate the

quality of the evidence found; however, each article was initially analyzed using 5 pre-selected quality criteria (level of evidence and research design, sampling/methodology, date of article publication, credibility of author, and relevance to scoping review question) to enhance standardization. The investigator used these criteria to determine the quality of evidence found and select three articles to critically appraise. The review also included a wide range of research designs and source types, which made it difficult to apply consistent appraisal methods across all resources. In addition, the fact that there was only one investigator and two databases searched when retrieving primary publications may have limited the number of articles screened, the number of search strategies utilized, or the potential for eliminating bias. To ensure rigor and address these factors the investigator obtained critiques from peer reviewers during each phase of the process.

Conclusion

This scoping review appraised 15 articles to explore the existing literature on methods to educate rehabilitation professionals on NTPC. Findings indicate that NTPC educational programs may consider incorporating practice, collaboration, feedback, and online multifactorial principles to increase learners' competence. Furthermore, training program developers should consider the different learning needs among team members when designing such education.

Author contributions

FM is responsible for conducting the scoping review process and writing the complete initial draft of the manuscript.
HO and JH provided guidance for the scoping review question, systematic process of the scoping review.
JH and HO reviewed and edited the manuscript and approved the final version of the manuscript.

ORCID iDs

Faye E McGuire ⓘ https://orcid.org/0000-0003-1846-6864
Jennifer Hutson ⓘ https://orcid.org/0000-0001-8037-718X

Supplemental Material

Supplemental material for this article is available online.

References

1. Hoffman LA. 24-hour posture care management: sleep positioning and sleep positioning systems. *Directions* 2017; 2017(5): 24–37. Available at: https://nrrts.org/wp-content/uploads/2019/06/DIRECTIONS-2017.5_CEUfeature.pdf (accessed 10 July 2021).
2. Wynn N and Wickham J. Night-time positioning for children with postural needs: what is the evidence to inform best practice? *Br J Occup Ther* 2009; 72(12): 543–550.
3. Centers for Disease Control and Prevention. *Data and Statistics for Cerebral Palsy*. Available at: https://www.cdc.gov/ncbddd/cp/data.html (accessed 9 June 2022).
4. Casey J, Rosenblad A, Rodby-Bousquet E, et al. Postural asymmetries, pain, and ability to change position of children with cerebral palsy in sitting and supine: a cross-sectional study. *Disabil Rehabil* 2020; 44(11): 1–9.
5. Goldsmith S. The mansfield project: postural care at night within a community setting: a feedback study. *Physiotherapy* 2000; 86(10): 528–534.
6. Hill CM, Parker RC, Allen P, et al. Sleep quality and respiratory function in children with severe cerebral palsy using night-time postural equipment: a pilot study. *Acta Paediatr* 2009; 98(11): 1809–1814.
7. Pountney TE, Mandy A, Green E, et al. Hip subluxation and dislocation in cerebral palsy–a prospective study on the effectiveness of postural management programmes. *Physiother Res Int* 2009; 14(2): 116–127.
8. Underhill J, Bryant E and Pountney T. The effect of sleep systems on sleep-wake patterns and pain levels in non-ambulant children and young people with cerebral palsy. *J Assoc Paediatr Chart Physiother* 2012; 3(1): 57–64.
9. Castle D, Stubbs B, Clayton S, et al. A 24-hour postural care service: views, understanding and training needs of referring multidisciplinary staff. *Int J Ther Rehabil* 2014; 21(3): 132–139.
10. Hutson JA, Hodges JS, Snow L, et al. Educating caregivers of persons with cerebral palsy in night-time postural care: a randomized trial comparing two online training programs. *Clin Rehabil* 2021; 35(9): 1–12.
11. Stinson M, Crawford S, Madden E, et al. Current clinical practice in 24-hour postural management and the impact on carers and service users with severe neurodisability. *Br J Occup Ther* 2021; 84(6): 355–365.
12. Humphreys G, King T, Jex J, et al. Sleep positioning systems for children and adults with a neurodisability: a systematic review. *Br J Occup Ther* 2019; 82(1): 5–14.
13. Hutson JA and Snow L. Sleep assessments for children with severe cerebral palsy: a scoping review. *Arch Rehabil Res Clin Transl* 2020; 30: 100087.
14. Innocente R. Night-time positioning equipment: a review of practices. *N Z J Occup Ther* 2014; 61(1): 13–19.
15. Arksey H and O'Malley L. Scoping studies: towards a methodological framework. *Int J Soc Res Methodol* 2005; 8(1): 19–32.
16. Melnyk BM and Fineout-Overholt E. *Evidence-Based Practice in Nursing & Healthcare: A Guide to Best Practice*. Philadelphia: Lippincott Williams & Wilkins, 2005, p. 10.
17. Baird JM, Raina KD, Rogers JC, et al. Wheelchair transfer simulations to enhance procedural skills and clinical reasoning. *Am J Occup Ther* 2015; 69(Supplement_2): 1–8.
18. Boucaut R and Howson D. Teaching safe patient handling skills using a peer approach. *Radiol Technol* 2018; 90(1): 20–30.
19. Carroll C, Booth A, Papaioannou D, et al. UK health-care professionals' experience of on-line learning techniques: a systematic review of qualitative data. *J Contin Educ Health Prof* 2009; 29(4): 235–241.
20. Jay J and Owen A. Providing opportunities for student self-assessment: the impact on the acquisition of psychomotor skills in occupational therapy students. *Assess Eval High Educ* 2016; 41(8): 1176–1192.
21. King G, Tam C, Fay L, et al. Evaluation of an occupational therapy mentorship program: effects on therapists' skills and family-centered behavior. *Phys Occup Ther Pediatr* 2011; 31(3): 245–262.
22. McCall M, Spencer E, Owen H, et al. Characteristics and efficacy of digital health education: an overview of systematic reviews. *Health Educ J* 2018; 77(5): 497–514.
23. Pittman CO, Lawdis K and Chatham University. Does the use of multifactorial training methods increase practitioners' competence? *J Educ Online* 2017; 14(2): n2.
24. Tolks D, Schäfer C, Raupach T, et al. An introduction to the inverted/flipped classroom model in education and advanced training in medicine and in the healthcare professions. *GMS J Med Educ* 2016; 33(3): Doc46.
25. Zaghab RW, Maldonado C, Whitehead D, et al. Online continuing education for health professionals: does sticky design promote practice-relevance? *Electron J E-Learn* 2015; 13(6): 466–474.
26. De Aguiar BM and Oliveira JA. Development of an online course about postural care with the newborn in the neonatal intensive care unit. *Int J Dev Res* 2019; 9(09): 29627–29632.
27. Hotham S, Hamilton-West KE, Hutton E, et al. A study into the effectiveness of a postural care training programme aimed at improving knowledge, understanding and confidence in parents and school staff. *Child Care Health Dev* 2017; 43(5): 743–751.
28. Hill S. A one year postural care training programme for the workforce supporting the needs of those with complex and continuing healthcare needs: project evaluation. *Postural Care CIC & Skills for Health* 2011; 59: 1–59.