Training occupational therapy students in wheelchair service provision: Essential steps for new rehabilitation professionals (Mini-Review)

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Abstract

Rehabilitation professionals face challenges in delivering wheelchair services due to insufficient education of occupational therapy students and related professionals. Inadequate preparation in both technical and communication skills can negatively impact the quality of care and the psychosocial well-being of individuals with disabilities. Gaps in theoretical knowledge, professionalism, empathy, and ethical practice limit students' clinical readiness, reducing trust between providers and service users. This review presents the World Health Organization's (WHO) eight-step best practice framework for wheelchair service provision and examines educational strategies implemented in university programs worldwide. Data were drawn from recent studies (2021–2025) evaluating the effectiveness of occupational therapy education before, during, and after the COVID-19 pandemic. Delivering high-quality wheelchair services enhances mobility, independence, and quality of life. Incorporating evidence-based, personalized training programs into academic curricula can significantly strengthen care delivery and promote social inclusion for individuals with mobility impairments.

Keywords: service provision, wheelchair, student education, best practice steps.

Treinamento de alunos de terapia ocupacional na prestação de serviços para cadeiras de rodas: Etapas essenciais para novos profissionais de reabilitação (Mini-revisão)

Resumo

Os profissionais de reabilitação enfrentam desafios na oferta de serviços para cadeiras de rodas devido à educação insuficiente dos alunos de terapia ocupacional e profissões relacionadas. A preparação inadequada em habilidades técnicas e de comunicação pode afetar negativamente a qualidade dos serviços prestados e o bem-estar psicossocial de pessoas com deficiência. Fatores como falta de conhecimento teórico, profissionalismo, empatia e prática ética criam uma lacuna na prática clínica dos alunos, o que pode prejudicar a confiança entre o profissional e o destinatário do serviço. Esta revisão se concentra em apresentar as oito etapas das melhores práticas da Organização Mundial da Saúde (OMS) e abordagens educacionais implementadas em programas universitários internacionais. Os dados foram coletados de estudos recentes (2021-2025) que examinam a eficácia da educação prática dos alunos de terapia ocupacional antes, durante e depois da pandemia de Covid-19. A oferta de serviços de cadeira de rodas de qualidade é fundamental para melhorar a mobilidade, a autonomia e a qualidade de vida das pessoas com deficiência. A incorporação de programas educacionais personalizados e baseados em evidências nos currículos universitários pode contribuir significativamente para a melhoria do cuidado e da inclusão social de pessoas com déficits de mobilidade.

Palavras-chave: prestação de serviços, cadeira de rodas, educação estudantil, etapas de melhores práticas.

1. Introduction

Personal mobility is a human right (Article 20 UNCRPD, 2018). The wheelchair is the primary means of

transportation for individuals with mobility disabilities and one of the assistive products that promotes functionality, autonomy, and participation in the community, as well as overall health and well-being (WHO, 2024). Recent research indicates that personal mobility by specialist staff is associated with satisfaction, quality of life, and empowerment of people with disabilities (Toro et al., 2015; Kirby et al., 2019).

Effective wheelchair services require a holistic and individualized approach, taking into account the needs, preferences, and environment of the user (Gowran, 2023). Health professionals, particularly occupational therapists, play a crucial role in the assessment and provision of assistive products and technologies, including wheelchairs, to improve the lives of people with disabilities (Keeler et al., 2018). And also, the need for training of professionals is key, as the implementation and use of wheelchair service recommendations can improve the quality of life and social participation of people with disabilities (Smith et al., 2023). However, despite the importance of education in the delivery of these services (Fung et al., 2020), it is not integrated into the curriculum, and students do not receive hands-on experience with wheelchairs, resulting in limited knowledge and skill acquisition (Fung et al., 2017).

This review will outline the 8 steps of best practice for wheelchair services as recommended by the World Health Organization (WHO, 2023) and review current educational practices in undergraduate occupational therapy education programs worldwide. Implementing structured training programs, such as those promoted by the WHO and ISWP, can increase the knowledge and confidence of new rehabilitation professionals (WHO, 2008; WHO, 2023; Gowran et al., 2019; Goldberg et al., 2024). Integrating these programs into the curriculum can help achieve the Sustainable Development Goals (SDGs), such as health and wellbeing (SDG 3), education (SDG 4), and social equality (SDG 10) by promoting social inclusion of people with disabilities (United Nations, 2022; WHO, 2024).

2. Materials and Methods

2.1 Systematic review search

This is a systematic review of the literature to examine the training of occupational therapy students in providing wheelchair services. The primary objective of the review is to identify current educational practices in undergraduate occupational therapy programs and to highlight the WHO guidelines for wheelchair service provision. At the same time, the review will support young rehabilitation professionals and encourage the integration of educational practices in other university programs.

Data was collected through a systematic search of electronic databases, including Medline/PubMed, CINAHL (Cumulative Index to Nursing and Allied Health Literature), Cochrane Library, Web of Science, Scopus, and Google Scholar. The search was limited to articles published in the last 5 years to ensure the data is current (Snyder; Snyder, 2019). The review focused on recent studies to ensure the inclusion of up-to-date education and guidelines.

The search strategy employed the keywords “wheelchair training”, “wheelchair service provision”, “student training”, “occupational therapy education”, “occupational therapy and wheelchairs”, and “assistive technology education” to identify the studies (Giesbrecht; McEwen, 2015). These terms were selected using a combination of Medical Subject Headings (MeSH) and free-text terms. Boolean operators (AND, OR) were used to combine the search terms, and filters were applied based on publication year, study type, and language.

Inclusion criteria:

- Peer-reviewed articles published between 2021–2025
- Focus on the education of occupational therapy or related rehabilitation students (e.g., physiotherapy)
- Addressing skills essential for the provision of wheelchair services
- Written in English or another European language
- Primary and secondary sources (reviews, qualitative, and quantitative studies)

Exclusion criteria:

- Articles discussing wheelchair rehabilitation without reference to student education

- Studies focused exclusively on technical specifications or wheelchair design
- Publications in non-scientific outlets or non-peer-reviewed conference proceedings
- Irrelevant to the specific research question

The initial search using the six core terms yielded 1,310 articles. After applying the exclusion criteria, 1,100 articles were removed. The most frequent reason for exclusion was the absence of focus on undergraduate education in wheelchair services. Additionally, only a limited number of articles addressed modern training methods published within the last five years. In the end, 210 articles were included in the review. These studies addressed the training of occupational therapy students in wheelchair provision, experiential workshops, and essential competencies that students must acquire to achieve clinical self-efficacy.

The selection and review of studies followed a systematic and objective approach to ensure the results (Pautasso, 2019; Gregory; Denniss, 2018). The ethical aspect of wheelchair education and use by rehabilitation professionals was also a key consideration in integrating assistive technology into the curriculum (Breithart, 2022). Figure 1 illustrates the literature search process according to PRISMA (Page et al., 2021).

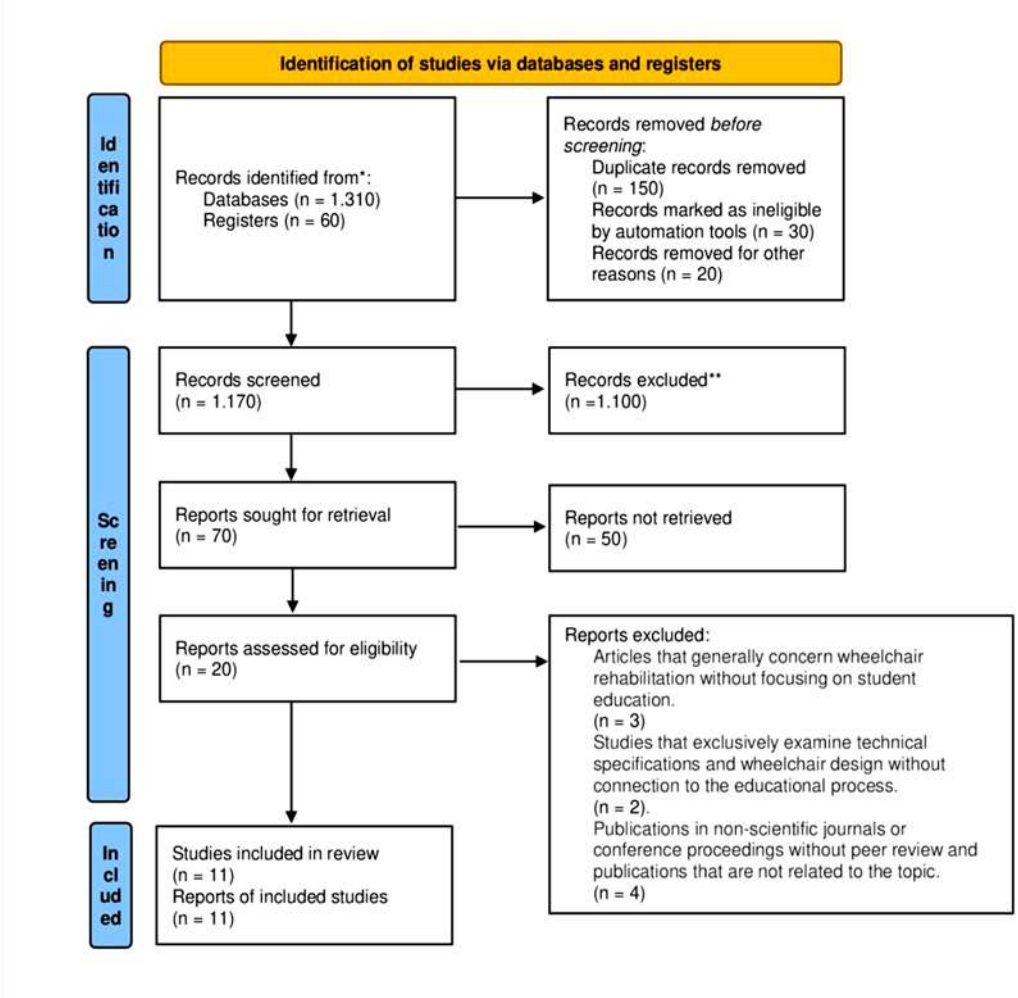

Figure 1. PRISMA 2020 Flow Diagram: Methodological Framework for Systematic Study Selection. Source: Authors, 2025.

The literature review adhered to the guidelines for narrative reviews as outlined by Gregory & Denniss (2018), and an ethical review was conducted (Reid et al., 2018). The data analysis and synthesis were based on the methods by Green et al. (2006), which emphasize the importance of presenting the literature clearly and

accurately in scientific writing (Grant; Booth, 2009). The whole process followed the principles of combining narrative and systematic review to have a structured and transparent approach to identifying and analyzing key findings (Pautasso, 2019).

3. Literature review

3.1 Recommendations for wheelchair service provision

The wheelchair service provision is a key part of rehabilitation for individuals with mobility impairments. It necessitates an integrated approach that encompasses selection, fit, training, and follow-up. The World Health Organization (WHO) has a four-step process: 1. Select, 2. Fit, 3. Train, 4. Follow-up (WHO, 2023). A brief description of each step is provided below in (Table 1).

Table 1. Steps in wheelchair service provision according to WHO (2023).

Steps	Description
1. Select	The first step is selecting the appropriate wheelchair, based on a comprehensive assessment of the user's needs and preferences. This includes evaluating motor abilities, functional goals, and living conditions. Selection must consider posture and support, ease of use, comfort, safety, and environmental compatibility.
2. Fit	After selection, the wheelchair is adjusted to provide optimal support and comfort. This involves modifications to the seat, backrest, footrests, and other components. Proper fitting helps prevent discomfort, pressure sores, and postural issues.
3. Train	Training for the user and caregivers is essential for the safe and effective use of the wheelchair. It includes maneuvering techniques, transfer strategies, and activities that promote autonomy in daily life.
4. Follow up	The final step is ongoing follow-up, involving periodic assessments of wheelchair use and the user's condition. The aim is to detect issues early, make necessary adjustments, and ensure continued alignment with the user’s evolving needs.

Source: Authors, 2025.

The provision of quality wheelchair services is a key factor in enhancing the mobility and independence of people with disabilities. According to the WHO and recent literature, this process requires a structured, client-centered, and multidisciplinary approach (Toro-Hernández et al., 2020; Giesbrecht et al., 2022; Kamalakannan et al., 2023; Smith et al., 2023). To support this, the WHO outlines eight essential steps for best practice in wheelchair service provision, which build upon the four basic steps previously described (see Table 1). These are summarized in (Table 2).

Table 2. The 8 steps of best practice according to WHO.

Steps	Description
1.Needs Assessment	A comprehensive evaluation of the user's physical, functional, and environmental needs. This initial step forms the basis for selecting or adapting an appropriate wheelchair.
2.Selection	See Table 1.
3.Fitting	See Table 1.
4.Training	See Table 1.
5.Follow-up	See Table 1.
6.Maintenance	Regular upkeep of the wheelchair ensures safety and optimal performance. This includes inspecting and repairing mechanical components and maintaining seating and support elements.
7.Outcome Evaluation	A process to monitor the wheelchair's impact on the user's quality of life, involving feedback from users and caregivers, and identifying any need for adjustments.
8.Continuous Improvement	Continuous improvement of wheelchair services is driven by ongoing data collection, re-evaluation of processes, and enhancement of service quality through systematic use of feedback and performance indicators.

Source: Authors, 2025.

By following WHO guidelines and evidence-based practice, rehabilitation professionals can ensure people with mobility impairments receive high-quality wheelchair services that promote independence, comfort, and meaningful social participation.

3.2 Training occupational therapy students in wheelchair service provision

One of the eight steps of wheelchair service provision, as defined by the World Health Organization (WHO, 2023), is wheelchair skills training. Numerous contemporary studies highlight the importance of incorporating this training into the curricula of rehabilitation professionals, demonstrating its positive impact on both students' self-confidence and the quality of life of future users (Toro-Hernández et al., 2020; Giesbrecht et al., 2021; Giesbrecht et al., 2022; Kamalakannan et al., 2023; Giesbrecht, 2024; Charlton et al., 2025). In particular, comprehensive training in wheelchair-related competencies is directly associated with greater user satisfaction, improved social participation, and enhanced autonomy in Activities of Daily Living (ADLs) (Rahim et al., 2021).

A good example of a structured approach is the Wheelchair Skills Training Program at Dalhousie University (Kirby et al., 2021). This program builds student skills and self-efficacy, which leads to better clinical competence and better outcomes for clients (Keeler et al., 2019; Rahim et al., 2021; Giesbrecht et al., 2021). An applied version of this model is seen in undergraduate occupational therapy programs in Canada through "experiential education boot camps" (Giesbrecht et al., 2021). These are 4-4.5 hours per day and are part of mandatory courses on wheelchair service provision. The process includes an online introductory presentation, group activities, and peer-to-peer role play. Students engage in clinical reasoning, evaluate each other's wheelchair handling, and provide structured, evidence-based feedback (Kirby; Doucette, 2019; Rushton; Daoust, 2019). This learning approach has been shown to increase student confidence and readiness to deliver wheelchair training to clients (Rushton; Daoust, 2019; Smith et al., 2020; Giesbrecht et al., 2021; Charlton et al., 2025).

A global survey by the World Federation of Occupational Therapists (WFOT) revealed that although 40% of occupational therapists use wheelchairs in their clinical practice, 29% reported receiving little to no training on the subject during their university studies (Alvarez et al., 2019). Similar findings have been reported across programs in Colombia (Toro-Hernández et al., 2020), Romania (Gowran et al., 2019), Kenya, the Philippines (Kirby et al., 2019), and Nova Scotia (Kirby et al., 2020), where the implementation of training does not align with WHO's recommended best practices. Historical data reinforce the extent of the problem. A study of 11 Canadian occupational therapy programs revealed that 36% lacked core training in wheelchair skills, and only 29% used evidence-based teaching methods (Best et al., 2015). During the COVID-19 pandemic, some institutions attempted online adaptations, but these lacked the effectiveness of in-person, hands-on instruction (Keeler et al., 2021). A 2022 study reported that fewer than 80% of students in Canada received adequate

wheelchair training, with most programs offering less than 2.5 hours of practical instruction (Giesbrecht et al., 2022).

The absence of robust clinical training in wheelchair skills remains a critical weakness in rehabilitation education. Even after the pandemic, universities continue to face challenges in delivering consistent, experiential learning opportunities. Given the hands-on nature of wheelchair service provision, real-world practice is essential to bridge the gap between theory and application, enhancing both student competence and client care (Giesbrecht, 2024). The COVID-19 pandemic exacerbated these shortcomings, causing interruptions in both practical and theoretical training (Fisher et al., 2022). The lack of "virtual experiences" such as case-based learning and peer role-play diminished students' confidence and decision-making abilities (Fisher et al., 2022; Giesbrecht et al., 2022; Giesbrecht, 2024). In the post-pandemic landscape, universities have refocused on in-person training, allowing students to regain hands-on clinical skills applicable in professional settings (Burrola-Mendez et al., 2022).

There are multiple reasons why other undergraduate programs should adopt similar experiential training models. Students not only learn how to perform skills but also how to teach them, strengthening their instructional and interpersonal abilities. This approach builds confidence in demonstrating wheelchair use and fosters peer-based learning that supports the development of assessment and intervention competencies. As future occupational therapists, students trained in this way are better prepared to deliver high-quality, individualized support to wheelchair users. Moreover, such training can evolve further through the integration of evidence-based practices (Rushton; Daoust, 2019).

3.3. Ethical dimension of wheelchair services education

The concept of justice in rehabilitation is a fundamental ethical issue, as disparities in educational opportunities directly affect the quality of services received by wheelchair users. According to the theory of social justice in healthcare, all patients should have equal access to quality rehabilitation. However, the level of education in wheelchair service provision varies widely depending on the country, institution, and available resources (Toro-Hernández et al., 2020). These disparities create ethical dilemmas about whether professionals are adequately prepared to deliver high-quality care to all individuals, regardless of their socioeconomic background. Moreover, educational inequality limits the ability to tailor services to users' individual needs, thereby undermining the core bioethical principles of beneficence and non-maleficence.

Universities have an ethical responsibility to ensure that students receive comprehensive training in wheelchair service provision. A lack of appropriate education may result in lower service quality and, consequently, reduced independence and diminished social participation for people with mobility impairments (Giesbrecht et al., 2022). Therapists also frequently encounter ethical challenges in practice, for example, when patients require a specific type of wheelchair but cannot access it due to financial limitations or restrictive healthcare policies (Rushton & Daoust, 2019). In such cases, professionals must navigate the tension between the duty to provide optimal care and the realities of system-level constraints. In addition, insufficient training in specialized wheelchair-related techniques may lead to poor guidance and suboptimal outcomes, raising further ethical concerns about the quality and equity of care. Embedding ethics-focused and evidence-based content into academic programs can help future therapists develop both the technical and ethical competencies necessary to respond effectively to such dilemmas (Best et al., 2015).

4. Conclusion

Training occupational therapy and rehabilitation students in wheelchair service provision is a key part of their development as future healthcare professionals. Knowledge and application of the basic principles of needs assessment, selection, fitting, and user training are essential for delivering high-quality person-centred rehabilitation services.

This review was written to support early career rehabilitation professionals by providing clear guidance on the standardized process of wheelchair service delivery. The steps defined by the World Health Organization (WHO)—"Needs Assessment", "Selection", "Fitting", "Training", "Follow-up", "Maintenance", "Outcome Evaluation", and "Continuous Improvement"—are the best practice framework. Following these steps is crucial for the structured progression of the therapeutic process and for maximizing users' function, independence, and quality of life. Therefore, integrating wheelchair training into the curriculum can improve service quality and produce skilled professionals who can meet the needs of people who use wheelchairs.

Despite the documented benefits of experiential programs such as the Wheelchair Skills Training Program and immersive "boot camp" approaches, many academic institutions—especially at the international level—still lack structured training models. Limited instruction time, inadequate clinical opportunities, and poor integration of WHO-recommended practices highlight the need to reform wheelchair education. The COVID-19 pandemic further disrupted practical training and created gaps in student preparedness. However, recent initiatives to get back to hands-on learning show the long-term value of experiential education and the importance of applying clinical skills in real life.

Going forward, we need to incorporate more innovative teaching methods into undergraduate programs in occupational therapy and related fields. Developing educational models that combine theoretical knowledge with practical experience will help students acquire the skills to deliver dynamic individualised support. Ultimately, the ongoing evolution and integration of wheelchair education into the curriculum is essential to produce competent professionals, meet the changing needs of users, and improve overall rehabilitation services.

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6. Authors' Contributions

Eleni Papadaki: study design, search for articles, project writing, research method, writing the literature review, formulation of the literature review, corrections, submission, and publication. *Myrto Patagia Bakaraki:* writing the ethical dimension, corrections, and final corrections.

7. Conflicts of Interest

No conflicts of interest.

8. Ethics Approval

Not applicable.

9. References

Alvarez, L., Wallcook, S., von Zweck, C., Timbeck, R., Ledgerd, R., & Ledgerd, R. (2019). Global indicators of assistive technology use amongst occupational therapists: Report from the World Federation of Occupational Therapists' Global Survey. *Global Perspectives On Assistive Technology*, 411, 476-488. https://apps.who.int/iris/handle/10665/325837

Best, K. L., Routhier, F., & Miller, W. C. (2015). A description of manual wheelchair skills training: Current practices in Canadian rehabilitation centers. *Disability and Rehabilitation: Assistive Technology*, 10(5), 393-400. https://doi.org/10.3109/17483107.2014.907367

Breithart, D. (2022). Ethical Issues in Occupational Therapy Education: Possible Solutions. *Canadian Journal of Occupational Therapy*. https://doi.org/10.7202/1077625ar

Burrola-Mendez, Y., Kamalakannan, S., Rushton, P. W., Bouziane, S. A., Giesbrecht, E., Kirby, R. L., & Pearlman, J. (2023). Wheelchair service provision education for healthcare professional students, healthcare personnel and educators across low-to high-resourced settings: a scoping review. *Disability and Rehabilitation: Assistive Technology*, 18(1), 67-88. https://doi.org/10.1080/17483107.2022.2037757

Caro, C. C., & Cruz, D. M. C. D. (2020). Training of the manual wheelchair skill: an integrating literature review. *Cadernos Brasileiros de Terapia Ocupacional*, 28, 661-681. https://doi.org/10.4322/2526-8910.ctoAR1863

Charlton, K., Murray, C., Layton, N., Ong, E., Farrar, L., Serocki, T., & Attrill, S. (2025). Manual wheelchair training approaches and intended training outcomes for adults who are new to wheelchair use: A scoping review. *Australian Occupational Therapy Journal*, 72(1), e12992. https://doi.org/10.1111/1440-1630.12992

Charlton, K., Murray, C., Layton, N., & Attrill, S. (2025). Manual wheelchair training programs: a scoping review of educational approaches and intended learning outcomes. *BMC Medical Education*, 25(1), 134. https://doi.org/10.1186/s12909-025-06718-6

Convention on the Rights of Persons with Disabilities. United Nations. (2018). Available at: https://treaties.un.org/Pages/ViewDetails.aspx?src=TREATY&mtdsg_no=IV-15&chapter=4&clang=_en

Ferrari, R. (2015). Writing narrative-style literature reviews. *Medical Writing*, 24(4), 230-235. https://doi.org/10.1179/2047480615Z.000000000329

Fung, K., Miller, T., & Rushton, P. W., Golberg, M., Toro, M. L., Seymour, N., & Pearlman, J. (2020). Integration of wheelchair service provision education: current situation, facilitators and barriers for academic rehabilitation programs worldwide. *Disability and Rehabilitation: Assistive Technology*, 15, 553-562. https://doi.org/10.1080/17483107.2019.1594408

Giesbrecht, E. (2024). Outcomes in occupational therapy students' preparation for wheelchair skills training provision. *Assistive Technology*, 36(2), 188-195. https://doi.org/10.1080/10400435.2023.2235594

Giesbrecht, E., Carreiro, N., & Mack, C. (2021). Improvement and retention of wheelchair skills training for students in entry-level occupational therapy education. *The American Journal of Occupational Therapy*, 75(1), 7501205160p1-7501205160p9. https://doi.org/10.5014/ajot.2021.040428

Giesbrecht, E. M., Rushton, P. W., & Dubé, E. (2022). Wheelchair service provision education in Canadian occupational therapy programs. *PLOS ONE*, 17(2), e0262165. https://doi.org/10.1371/journal.pone.0262165

Giesbrecht, E., & McEwen, I. (2015). Wheelchair boot camp: enabling occupational therapy students to be effective wheelchair trainers. *RESNA Annual Conference*. Retrieved from https://www.resna.org

Goldberg, M., Rushton, P., Kirby, R. L., Munera, S., Kandavel, K., Pearlman, J., & Tawashy, A. (2024). Wheelchair service provision content in professional rehabilitation organisations' standards documents and contemporary initiatives: A rapid review. *Disability and Rehabilitation: Assistive Technology*, 19(1), 78-89. https://doi.org/10.1080/17483107.2022.2063421

Gowran, R. J., Goldberg, M., Comanescu, G., Ungureanu, C., Garcia, F. D. S., Xavier, C. A., & Pearlman, J. (2019). Developing country-specific wheelchair service provision strategic plans for Romania and the Philippines. *Disability and Rehabilitation: Assistive Technology*. https://doi.org/10.1080/17483107.2018.1539131

Grant, M. J., & Booth, A. (2009). A typology of reviews: an analysis of 14 review types and associated methodologies. *Health Information & Libraries Journal*, 26(2), 91-108. https://doi.org/10.1111/j.1471-1842.2009.00848.x

Green, B. N., Johnson, C. D., & Adams, A. (2006). Writing narrative literature reviews for peer-reviewed journals: secrets of the trade. *Journal of Chiropractic Medicine*, 5, 101-117. https://doi.org/10.1016/S0899-3467(07)60142-6

Gregory, A. T., & Denniss, A. R. (2018). An introduction to writing narrative and systematic reviews — Tasks, Tips and traps for aspiring authors. *Heart, Lung and Circulation*, 27(7), 893-898. https://doi.org/10.1016/j.hlc.2018.03.027

Kamalakannan, S., Rushton, P. W., Giesbrecht, E., Rusaw, D. F., Bouziane, S. A., Nadeau, M., & Pearlman, J. (2023). Wheelchair service provision education for healthcare professional students, healthcare personnel and educators across low-to high-resourced settings: a scoping review protocol. *Disability and Rehabilitation: Assistive Technology*, 18(3), 343-349. https://doi.org/10.1080/17483107.2020.1852325

Keeler, L., Kirby, R. L., Parker, K., McLean, K. D., & Hayden, J. A. (2019). Effectiveness of the wheelchair skills training program: A systematic review and meta-analysis. *Disability and Rehabilitation: Assistive Technology*. https://doi.org/10.1080/17483107.2018.1456566

Kirby, R. L., Rushton, P. W., Smith, C., Routhier, F., Archambault, P. S., Axelson, P. W., Best, K. L., Betz, K., Burrola-Mendez, Y., Contepomi, S., Cowan, R., Giesbrecht, E. M., Kenyon, L. K., Koontz, A., Lettre, J., MacKenzie, D., Mortenson, B., Parker, K., & Worobey, L. A. (2021). Wheelchair skills program manual**.** *Dalhousie University*. http://www.wheelchairskillsprogram.ca/eng/manual.php

Kirby, R. L., Smith, C., Parker, K., Han, L., Theriault, C. J., & Doucette, S. P. (2020). Practices and views of occupational therapists in Nova Scotia regarding wheelchair-skills training for clients and their caregivers:

an online survey. *Disability and Rehabilitation: Assistive Technology*, 15(7), 773-780. https://doi.org/10.1080/17483107.2020.1749890

Kirby, R. L., & Doucette, S. P. (2019). Relationships between wheelchair services received and wheelchair user outcomes in less-resourced settings: a cross-sectional survey in Kenya and the Philippines. *Archives of Physical Medicine and Rehabilitation*, 100(9), 1648-1654. https://doi.org/10.1016/j.apmr.2019.02.002

Mathis, K., & Gowran, R. J. (2023). A cross-sectional survey investigating wheelchair skills training in Ireland. *Disability and Rehabilitation: Assistive Technology*, 18(7), 1221-1228. https://doi.org/10.1080/17483107.2021.2001058

Onwuegbuzie, A. J., Leech, N. L., & Collins, K. M. T. (2012). Qualitative analysis techniques for the review of the literature. *The Qualitative Report*, 17(28), 1-28. https://doi.org/10.46743/2160-3715/2012.1754

Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., & Moher, D. (2021). The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ*, 372. https://doi.org/10.1136/bmj.n160

Pautasso, M. (2019). The structure and conduct of a narrative literature review. *A Guide to the Scientific Career*, 299-310. https://doi.org/10.1002/9781118907283.ch31

Quiñones-Uriostegui, I., Alessi-Montero, A., Bueyes-Roiz, V., Nuñez-Carrera, L., Moreno-Hernández, A., Quinzaños-Fresnedo, J., & Rodríguez-Reyes, G. (2024). Wheelchair users' satisfaction after provision using the WHO 8-step guidelines: A pilot study. *The Journal of Spinal Cord Medicine*, 47(5), 640-648. https://doi.org/10.1080/10790268.2023.2171627

Rahim, M. Z. A., Daud, A. Z. C., & Yang, N. A. A. R. (2021). Wheelchair skills training: A scoping review. *Environment-Behaviour Proceedings Journal*, 6(17), 165-172. https://doi.org/10.21834/ebpj.v6i17.2879

Reid, A. M., Brown, J. M., Smith, J. M., Cope, A. C., & Jamieson, S. (2018). Ethical dilemmas and reflexivity in qualitative research. *Perspectives on Medical Education*, 7(2), 69–75. https://doi.org/10.1007/s40037-018-0412-2

Rushton, P. W., & Daoust, G. (2019). Wheelchair skills training for occupational therapy students: comparison of university-course versus "boot-camp" approaches. *Disability and Rehabilitation: Assistive Technology*, 14(6), 595-601. https://doi.org/10.1080/17483107.2018.1486468

Sarsak, H. I., von Zweck, C., Ledgerd, R., & World Federation of Occupational Therapists. (2023, April). Wheeled and seated mobility devices provision: quantitative findings and SWOT thematic analysis of a global occupational therapist survey. *Healthcare*, 11(8), 1075. https://doi.org/10.3390/healthcare11081075

Smith, E. M., & Pearlman, J. (2023). WHO wheelchair provision guidelines set an aspirational standard for assistive technology service delivery. *Assistive Technology*, 35(3), 203-204. https://doi.org/10.1080/10400435.2023.2222598

Snyder, H., & Snyder, H. (2019). Literature review as a research methodology: An overview and guidelines. *Journal of Business Research*, 104, 333-339. https://doi.org/10.1016/j.jbusres.2019.07.039

Stein, F. (2015). *International Handbook of Occupational Therapy Interventions*. Springer.

Toro-Hernández, M. L., Alvarez, L., Vargas-Chaparro, M. C., & Goldberg, M. (2020). Final year students' knowledge on basic manual wheelchair provision: the state of occupational therapy programs in Colombia. *Occupational Therapy International*, 2020. https://doi.org/10.1155/2020/3025456

Toro, M. L., Eke, C., & Pearlman, J. (2015). The impact of the World Health Organization 8-steps in wheelchair service provision in wheelchair users in a less-resourced setting: a cohort study in Indonesia. *BMC Health Services Research*, 16, 26. https://doi.org/10.1186/s12913-016-1268-y

Toro, M., Gartz, R., Golberg, M., Rushton, P., Seymour, N., Fung, K., & Pearlman, J. (2017). Wheelchair service provision education in academia. *African Journal of Disability*, 6, 340. https://doi.org/10.4102/ajod.v6i0.340

Tewksbury, A. S. D., & R. (2013). How to write a literature review. *The Justice System Journal*, 1253. https://doi.org/10.1080/10511253.2012.730617

United Nations. (2022). The 2030 Agenda for Sustainable Development. United Nations. https://www.un.org/sustainabledevelopment/sustainable-development-goals/

Wieczorek, B., Kukla, M., Warguła, Ł., & Giedrowicz, M. (2023). Ergonomic guidelines for the design interfaces of additive modules for manual wheelchairs: sagittal plane. *Scientific Reports*, 13(1), 11993. https://doi.org/10.1038/s41598-023-39085-7

World Health Organization. (2008). Guidelines on the provision of manual wheelchairs in less resourced settings. WHO Press. https://www.who.int/publications/i/item/9789241547482

World Health Organization. (2023). Guidelines on the provision of manual wheelchairs in less-resourced settings. WHO Press. https://www.afro.who.int/publications/guidelines-provision-manual-wheelchairs-less-resourced-settings

World Health Organization. (2023). Wheelchair provision guidelines. World Health Organization. https://play.google.com/books/reader?id=z2XDEAAAQBAJ&pg=GBS.PP1&hl=el

World Health Organization. (2024). *Health and wellbeing for all: A global approach to inclusive healthcare*. https://www.who.int

World Federation of Occupational Therapists (WFOT). (2022). Guidelines for the use of assistive technology in occupational therapy. WFOT Journal. https://wfot.org/resources/occupational-therapy-and-assistive-technology

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