Development and Implementation of a Hybrid Wheelchair Workshop for Clinicians in International Settings

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**Introduction**

The World Health Organization (WHO) estimates that 10% of the people with disabilities, approximately 112 million, need a wheelchair for mobility and function, and only 5% - 15% have access to a properly fitted wheelchair, indicating that approximately 96 million people do not have a wheelchair or have one that does not meet their needs (1-4)The United Nations Convention on the Rights of People with Disabilities (UNCRPD), ratified by 175 countries, mentions the importance of an appropriate wheelchair delivered by trained clinicians in six of its Articles (4, 9, 20, 25, 26, and 32)(5). In particular, Article 20 emphasizes the need to promote personal mobility with the greatest independence by providing training to persons with disabilities and personnel providing services to them(6). The WHO Guidelines for the Provision of Manual Wheelchairs in Less-Resourced Settings emerged as an international effort to promote training and to assist nations in fulfilling the UNCRPD mandate.

In 2012, the WHO, in partnership with the United States Agency for International Development (USAID), published, based on the WHO Guidelines, the first manual of a series of Wheelchair Service Training Packages (WHO WSTP): The Wheelchair Service Training Package Basic Level (WHO WSTP-B)(1, 2). The purpose of the WHO WSTP-B is to develop the skills and knowledge of personnel that are required to deliver basic level wheelchair services to people with mobility impairments who can sit upright without additional postural support. No clinical background is required to access the training, which makes it feasible to replicate in places where there are few to no professionals in the field of seating and mobility. The WHO WSTP-B follows a learning methodology of 40 hours of training spread over five consecutive days(2). This training format may make it difficult for busy providers to attend and scale across multiple settings, including university training programs. As a result, there still is a widespread delivery of inappropriate wheelchairs worldwide which indicates the training uptake has been slow, and capacity is insufficient.

Thus, in 2016, the International Society of Wheelchair Professionals (ISWP) developed a Hybrid Basic Course (HC) based on the WHO-WSTP-B. The HC uses an alternative learning methodology that combines online modules and 3.5 days of in-person training. The HC was tested in India, Colombia, Mexico, and USA and proved to be effective in increasing knowledge on basic level wheelchair provision measured by the validated ISWP Basic Wheelchair Service Provision test. Despite the reduction of in-person training and its associated cost, the Hybrid in-person portion is geographically limited and too few people can participate. However, when offering online components as pre-learning content, a reduced in-person session can be offered at international conferences or community-based rehabilitation centers to facilitate shorter in-person training sessions and reach an international audience.

The specific aims of this study were to:

1. Determine the appropriate allocation of online content to develop a Hybrid Course Workshop of two-days of in-person training.
2. Implement and evaluate the Hybrid Course Workshop at an international conference with a representation of physical therapists (PT), occupational therapists (OT), and prosthetics and orthotics (P&O).

We hypothesized that trainees of the Hybrid Course Workshop would have significantly higher knowledge based on the ISWP Wheelchair Service Provision – Basic Test post-training.

**Materials and Methods**

To address **specific aim 1**, a panel of experts with experience in delivering wheelchair training and developing educational programs for international settings reviewed the content allocation of the HC and identified in-person modules that could be allocated online. In addition, the panel selected core in-person modules and activities considered crucial practical exercises to develop the skills for basic level wheelchair provision. The new online modules followed the design and development methodology of the HC.

To address **specific aim 2**, the authors of the paper selected the 7th Forum United Frontiers as the international conference where the HCW was implemented. The Forum’s target audience includes PTs, OTs, P&Os among other professions.

Study population

The sample was selected using a convenience sampling method guided by the co-authors and the conference marketing department. Electronic flyers, hosted on the conference website, included the description of the course, inclusion and exclusion criteria, location, online and in-person time commitment, schedule, registration process and contact information.

The study’s inclusion criteria included: 1) PT, OT, P&O, and related professions clinicians or students; 2) who have not taken the ISWP Wheelchair Service Provision – Basic Test. The exclusion criteria included: 1) individuals who have taken or completed the WSTP-B or the ISWP Wheelchair Service Provision – Basic Test; and 2) who are simultaneously participating in another wheelchair-related study.

Outcome measure: wheelchair service provision knowledge

The ISWP Wheelchair Service Provision – Basic Test is a valid method for measuring basic competency of wheelchair professionals (7).The test consists of 19 sociodemographic questions, 75 multiple choice questions that evaluate basic wheelchair service delivery, independent of geographic location. The multiple-choice questions evaluate seven domains of wheelchair service delivery: 1) assessment; 2) prescription; 3) fitting; 4) production; 5) user training; 6) process; and 7) follow-up and maintenance. Test scores greater than or equal to 53 points (70% of total points) are considering passing scores (7). The test was hosted and distributed online through the testing platform, Test.com®. Participants received an email with the instructions on how to log into the platform and how to take the test. Participants completed the test one week before and one week after the intervention.

Data management and analysis

All data was collected in a Test.com® database, exported into a CSV file and then into SPSS® Version 24.0. Frequency, percentage, central tendency and dispersion measures were calculated for categorical and continuous variables, respectively. For the outcome measure, knowledge change, a paired sample t-test was calculated to compare the levels of knowledge between baseline and post-training. All analyses were carried out using an alpha level of 95% (p<0.05).

**Results**

**Specific Aim 1: Determining the appropriate allocation of online content and developing of online modules**

The panel of experts selected 4 modules to develop online and added to the original 8 online modules of the Hybrid Course. For the two days of in-person session, the panel selected 4 modules (i.e. prescription, product preparation, fitting, and problem solving) and activities from 3 online modules (i.e. pressure sores, cushions, and physical assessment). Table 1 presents the WSTP-B content and the HC and HCW content allocation.

Table 1.

1. WSTP-B Content

|  |  |
| --- | --- |
| **WHO Wheelchair Service Training Package - Basic Level's (WSTP-B) Content** | |
| **Sections** | **Modules** |
| A. Core Knowledge | A.1: Wheelchair users  A.2: Wheelchair services  A.3: Wheelchair mobility  A.4: Sitting upright  A.5: Pressure sores  A.6: Appropriate wheelchair  A.7: Cushions  A.8: Transfers |
| B. Wheelchair Service Steps | B.1: Referral and appointment  B.2: Assessment  B.3: Assessment interview  B.4: Physical assessment  B.5: Prescription (selection)  B.6: Funding and ordering  B.7: Product (wheelchair) preparation  B.8: Cushion fabrication  B.9: Fitting  B.10: Problem solving  B.11: User training  B.12: Maintenance and repairs  B.13: Follow up  B.14: Putting it all together |

1. Hybrid Couse and Hybrid Workshop content allocation

|  |  |  |  |
| --- | --- | --- | --- |
| **Course** | **Content allocation** | | |
| **Online** | **In-person** | **Independent study\*** |
| Hybrid Course (HC) | A.1 - A.8 | B.1 - B.14 |  |
| Hybrid Course Workshop (HCW) | A.1 -B.4 | A.5, A.7, B.4, B.5, B.7, B.9, B.10 | B.6, B.8, B.11-B.14 |
| \*Trainees were instructed to review these modules independently. | | | |

**Specific Aim 2: Determining the appropriate allocation of online content and developing of online modules**

A total of 22 participants from 4 countries (i.e. Mexico, El Salvador, Costa Rica, and the Dominican Republic) were recruited; all of them completed the pre-and post-assessments, and therefore, there were no dropouts. Paired sample t-tests were conducted to compare knowledge change between pre-and post-assessments for total test scores by total participants and by profession.There were significant increases in within-subject scores on the ISWP Wheelchair Service Provision – Basic Test after the subjects participated in the Hybrid Course Workshop, with an average increase in the score of 8.73±6.20, p<0.0001. Table 2 presents the paired sample t-tests between pre-and post-assessments by profession.

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| --- | --- | --- | --- | --- | --- | --- |
| **Table 2.** Pretest and posttest scores of participants | | | |  |  |  |
| **Profession** | **N** | **Pretest** | | **Posttest** | | **p-value** |
| Mean | Standard Deviation | Mean | Standard Deviation |
| Physical Therapy (PT) | 4 | 49.75 | 5.85 | 58.25 | 2.36 | 0.027\* |
| Occupational Therapy (OT) | 10 | 54 | 5.50 | 61.80 | 4.42 | 0.001\* |
| Prosthetics and Orthotics (P&O) | 5 | 44.40 | 1.95 | 54.80 | 10.83 | 0.070 |
| Others | 3 | 53.33 | 6.03 | 62.67 | 2.31 | 0.181 |
| Total participants | 22 | 50.95 | 6.15 | 59.68 | 6.44 | <0.0001\* |
| \*paired t-test significant at the <0.05 level | |  |  |  |  |  |

**Discussion and Conclusion**

A Hybrid Course Workshop on Wheelchair Service Provision for wheelchair providers in international contexts was developed using the same systematic approach as the ISWP Hybrid Course. The Hybrid Course Workshop was effective in increasing basic level wheelchair knowledge in a pilot held at an international conference. The analysis by professions demonstrates PTs and OTs had a significant increase between posttest and pretest while P&O and other professions (2 PhDs in Rehabilitation Sciences and 1 Business Administrator) did not show a statistical increase of knowledge using the validated ISWP Wheelchair Service Provision – Basic Test. These differences may be attributed to the familiarity of pre-professional training and professional practice that PTs and OTs have in wheelchair services. It is important to note that we used a convenience sampling method with inequivalent group sizes and participants were from low and middle-income countries (LMICs) in Latin America, therefore results should be generalized with caution. Future studies may be interested in increasing the sample size, having equivalent group size, and including professionals from other LMICs.

International conferences seem to be a feasible venue to offer internationally recognized training opportunities that are not otherwise offered in pre-professional training or continuing education programs. Assessing participants’ knowledge before the in-person workshop can help trainers to adapt the practical sessions towards the areas that need reinforcement. The future work of this study includes piloting the workshop in community-based rehabilitation facilities.

**References**

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