Long-term effects of a wheelchair skills boot camp on clinicians' capacity, self-efficacy and delivery of wheelchair skills training

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INTRODUCTION

There is considerable evidence in the literature supporting the value of providing comprehensive skills training in the wheelchair provision process. Best practice, including guidelines proposed by the World Health Organization and RESNA, explicitly articulate training as a critical step in this process.[1, 2] Improving wheelchair skills capacity has been associated with improved mobility, self-efficacy, independence and quality of life while reducing caregiver burden.[3] Despite evidence supporting the benefits in delivery of structured, comprehensive wheelchair skills training, implementation in clinical practice continues to be limited. For example, a recent survey conducted among 68 Canadian rehabilitation facilities reported that one in five did not provide even basic mobility training to patients and 31% never provided advanced wheelchair skills training.[4] The reasons for variability and limited extent of skills training in clinical practice are multiple and complex; however, clinicians report that uncertainty about implementation and limited capacity and confidence in demonstrating and teaching skills are contributing factors.[4] These factors are, in part, related to the preparation clinicians receive in their entry-to-practice education. A survey among 21 occupational therapy (OT) and physical therapy (PT) university programs in Canada revealed that 24% did not include content related to manual wheelchair (MWC) skills training at all, 52% rarely or never used demonstration as a teaching strategy, and 38% rarely or never provided hands-on instruction.[5]

Conversely, some professional entry-to-practice programs do integrate advanced training. In the previously cited study, 38% incorporated content from a validated skills training program, such as the Wheelchair Skills Program,[6] into their curriculum. Several studies document the benefits of providing MWC skills training to health care professionals.[7-9] Giesbrecht et al.[8] reported a significant improvement of 39% with a large effect size (Cohen d = 2.8) for skill capacity and a significant improvement of 32% with a large effect size (Cohens d = 2.8) for wheelchair-specific self-efficacy following a skills "boot camp" with OT students. These findings are encouraging, as they suggest clinicians would be better prepared to demonstrate and teach a comprehensive repertoire of MWC skills to their clients; however, there is little evidence regarding skill capacity post-graduation between those who do and those who do not receive training. Furthermore, there is no evidence yet to suggest that this level of training impacts future clinical practice, nor whether the benefits obtained during entry-to-practice education are retained after graduation. To address this gap in the literature, we conducted a survey with a population of OT graduates, some of whom had attended the MWC skills boot camp as a student and some whom had not. The objectives of the study were to:

1. Describe current wheelchair skill capacity; wheelchair self-efficacy; and self-efficacy for wheelchair skill assessment, training and spotting among OT graduates in clinical practice;
2. To compare wheelchair skills capacity, wheelchair self-efficacy, and training self-efficacy between boot camp attenders and non-attenders; and
3. To measure retention of wheelchair skills capacity and wheelchair self-efficacy among OT graduates who attended a MWC skills boot camp.

METHODS

Recruitment and administration

We used a cross-sectional online survey administered through the Research Electronic Data Capture (REDCap) platform, which provides secure data collection in compliance with provincial regulations regarding privacy and personal information. Ethical approval was obtained from the University of Manitoba Health Research Ethics Board. Potential study participants were Master of Occupational Therapy program graduates between 2014 and 2016 at the University of Manitoba (n=145). Among these graduates, 93 (64%) had voluntarily participated in an extra-curricular MWC skills boot camp approximately 4 hours in duration; the remainder had not. Invitations to participate were extended via personal emails (provided at the time of graduation), with follow-up emails after 3, 5 and 8 weeks. Individuals who responded to the invitation were sent a second email with a link to the survey. After completion, survey responses were downloaded into a spreadsheet. Participants who had attended the boot camp were identified and their data linked to pre-graduation scores on two of the outcome measures, where available; once linked, participants were assigned an identification number and linking information was destroyed to ensure anonymity of the data.

Survey

The survey included three standardized questionnaires: the Wheelchair Skills Test Questionnaire (WST-Q) v. 4.2,[6] the Wheelchair Use Confidence Scale for MWC Users – Short Form (WheelCon-M:SF),[10] and the Self-Efficacy on Assessing, Training and Spotting (SEATS) test.[11] The WST-Q asks respondents to rate their capacity to perform 32 different wheelchair skills on a 3-point scale (2 = yes, 1 = yes, with difficulty, and 0 = unable); a total score (0-100%) is calculated. The WheelCon asks respondents to rate their confidence in performing 21 MWC-related activities on an 11-point scale from 0 (not confident) to 10 (completely confident); a total mean score (0-10) is calculated. The SEATS asks respondents to rate their confidence regarding 32 MWC skills (consistent with the WST) on a scale from 1 (not at all confident) to 5 (completely confident) with respect to three different constructs: **Assessing** each skill with a client, **Training** the client in each skill, and safely **Spotting** the client during training in each skill. An additional section asks respondents to rate their confidence on 5 components of **Documentation**. A mean score (0-5) is calculated for each of the four sections of the SEATS.

Analysis

Current scores for respondents on each of the outcome measures were summarized using descriptive statistics. Comparison between boot camp attendees and non-attendees were conducted using ANOVA for each measure. Retention of scores on the WST-Q and WheelCon for boot camp attendees was assessed using a paired t-test.

RESULTS

A total of 25 graduates initiated the survey, for a response rate of 17%. Among respondents, 20 (80%) were boot camp attenders and 5 (20%) were non-attenders. Not all participants completed the entire survey; 25 (100%) completed the WST-Q and 23 (92%) completed the WheelCon and SEATS (only 22 participants complete the Documentation section of the SEATS).

Description of current WST-Q, WheelCon and SEATS scores

Among all respondents (n=25) the mean (sd) WST-Q score was 66.9% (13.6). The mean (sd) WheelCon score (n=23) was 7.2 (1.2). For the SEATS, the mean (sd) for Assessing was 3.7 (0.8); for Training was 3.3 (0.8); for Spotting was 3.6 (0.8); and for Documentation was 3.6 (0.9).

Comparison between boot camp attenders and non-attenders

There was a significant different ($F = 4.75$, $p = 0.04$) in current WST-Q scores between boot camp attenders (mean 69.7, sd 11.5, n=20) and non-attenders (mean 55.9, sd 7.7, n=5). WheelCon scores were higher for the boot camp attenders (mean 7.3, sd 1.1, n=19) than the non-attenders (mean 6.5, sd 1.5, n=4), but were not significantly different ($F = 1.9$, $p = 0.18$). On the SEATS measure, there was a significant difference between groups for Assessment ($F = 6.2$, $p = 0.02$), Training ($F = 4.9$, $p = 0.003$), and Spotting ($F = 9.1$, $p = 0.006$), but not for Documentation ($F = 1.4$, $p = 0.25$). The SEATS scores are summarized in Table 1.

Table 1. SEATS scores for attenders and non-attenders

SEATS Construct	SEATS mean score (sd)	
	Boot camp attenders	Boot camp non-attenders
Assessment	3.9 (0.6)	2.9 (1.2)
Training	3.5 (0.6)	2.3 (1.0)
Spotting	3.8 (0.6)	2.6 (1.0)
Documentation	3.7 (0.7)	3.1 (1.8)

Retention of skill capacity and self-efficacy among boot camp attenders

While 20 respondents indicated they had attended the boot camp, student data (i.e. post-boot camp) was only available for 17 respondents on the WST and 14 respondents on the WheelCon. For the WST-C, the mean score (sd) immediately following boot camp attendance was 76.3% (6.7) and at follow-up (i.e. on the survey) it was 69.2% (12.4). The mean difference (sd) between boot camp and follow-up was 7.1% (11.9); this difference was significant ($t = 2.5$, $p = 0.025$). For the WheelCon, the mean score (sd) after the boot camp was 7.9 (0.9) and at follow-up was 7.2 (1.2), for a mean difference of 0.7 (1.4); this difference was not significant ($t = 1.8$, $p = 0.10$).

DISCUSSION

The study findings provide evidence suggesting comprehensive MWC skills training for OT students has benefits for clinical practice. Overall, survey respondents reported reasonably high levels of MWC skill capacity and self-efficacy. Clinicians having the capacity and confidence to perform skills would be expected to enhance their ability to teach clients skills, given the value of visual learning through demonstration identified in the motor learning literature.[12] Furthermore, survey respondents reported relatively high levels of confidence in terms of service delivery, although clinicians were more confident with assessment and spotting than with delivering training. More importantly, clinicians who had attended the MWC skills boot camp as a student reported significantly higher skill capacity and higher self-efficacy, although the latter was not statistically significant. These differences carried over into clinicians rating of self-efficacy for assessing, training and spotting skills with their clients, which were significantly higher among clinicians that attended the boot camp than those who had not. It is likely that, since they were competent with a larger repertoire of skills and had greater confidence with skill performance, these clinicians were more comfortable evaluating their clients' capacity for performance and providing specific training strategies and feedback.

Survey respondents who had attended the boot camp demonstrated retention of wheelchair self-efficacy after they moved into clinical practice. The lack of a significant difference between WheelCon scores after the boot camp and those reported in the follow-up survey confirms that the benefit obtained, which have been reported to be large,[8] continued to persist for at least one year. Skill capacity did demonstrate a decline between boot camp and follow-up, as indicated by the statistically significant difference found. The decline was approximately 9%, which corresponds to roughly 3 skills on the WST. It may be that the decline noted is due to losses in previous capacity for advanced skills, such as wheelie-related maneuvers. It should be noted that, despite this decline, boot camp attendees still had high levels of skill capacity, and these were significantly higher than respondents who did not attend the boot camp.

The specific aspects of the boot camp that were most influential to OT students' comfort and capacity for providing skills training are unknown. The boot camp curriculum includes explanation, demonstration and practice of skills; spotting and feedback for colleagues; and discussion/teaching of motor learning principles as they apply to teaching skills. A better understanding of how each factor influences clinical practice would inform further refinement of boot camp delivery. Future research should investigate these factors to determine more optimal approaches to preparing entry-to-practice professional students.

Several limitations in this study should be noted. The response rate was reasonable, given the challenges of contacting graduates several years later; however, respondents may not have been representative of the population and the response rate for boot camp attendees was higher than for non-attendees.

CONCLUSION

This is the first study to investigate retention of wheelchair skills and self-efficacy among OTs after graduation from their entry-to-practice professional program and to compare clinicians' self-efficacy for skills training delivery based on the content of their professional training. The benefits of a skills boot camp on skill capacity and self-efficacy for OT students continues to persist after entry into practice, although some decline in skill capacity can be anticipated. A skills boot camp appears to have positive benefits on clinicians' self-effiacy for assessment, training and spotting of skills with their clients.

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