Institute of Nursing and Health Research

Wheelchair Skills Training Programme for Children: A Pilot Study

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Introduction

The nature of this study was framed around promotion of functional independence and skill acquisition in young wheelchair users. Wheelchair skills training refers to the formal teaching of the techniques required to mobilise a wheelchair for maximal independence and energy conservation. The project implemented a wheelchair skills programme and tested the participants' skills level pre- and post-intervention. Results showed an improvement in basic, intermediate and advanced skill levels, and in confidence and independence post intervention

Objective

To explore the effectiveness of a wheelchair skills training programme on wheelchair skills development and independence of young wheelchair users.

Methods

The research study ran for a duration of eight months in total, an initial testing day, six training sessions over a six month period, and a final testing day. Ethical approval was obtained from Ulster University Research Governance Filter Committee, Office of Research Ethics Northern Ireland, (15/YH/0383) and governance from the Northern Health and Social Care Trust (NHSCT), in March 2016.

- *Outcome Measures:*
  - Northern Ireland (NI) Manual Wheelchair Skills Assessment Tool – several tasks from this tool were excluded to adapt it for use with children. The Activity Scale for Kids (ASK) performance version[1], Demographic questionnaire and an Impact questionnaire were also administered.

- *"Pre-test" testing day:*
  - On arrival at the initial testing day, participants were asked to complete a demographic questionnaire. This included information relating to age, gender, medication, type of school attended, class group in school, participation in physical education in school, type of chair used and any previous wheelchair skills training.
  - Participants then proceeded to the testing area where they completed the NI Manual Wheelchair Skills Assessment.
  - On completing the skills assessment, participants and their parents were asked to complete the ASK and demographic questionnaire.

- *Training Period:*
  - The following six months consisted of monthly skills training sessions delivered by the Regional Wheelchair Skills Training Therapist Northern Ireland (ER) and six Occupational Therapists (OT).
  - Attendance was recorded at all training sessions and each session began with a fun game/ice-breaker game.
  - The training sessions were graded for all levels and abilities and focused on functional activities such as negotiating obstacles, flicking the castors, and up and down curbs.
  - Refreshments were provided by Causeway Wheelers midway through the session which provided children with a small rest period.
  - In the case of fatigue, participants had the option to sit out if he or she wished, and the OT staff on hand monitored this.
  - Additional wheelchairs were provided by ER and brought to the sessions where both parents and siblings could join in the games with the emphasis on fun and social engagement.

- *"Post-test" testing day:*
  - The final testing day ran similarly to the initial testing day.
  - Participants and their parents/guardian were invited to complete the NI Manual Wheelchair Skills Assessment again, along with the ASK and impact questionnaire.
  - Fun games were arranged in a separate hall for children to join in once they had completed the assessments.

- *Data Analysis*
  - All data was collected and input into Excel under participant identifier numbers. For statistical analysis, the data was exported into Statistical Package for Social Sciences (SPSS) version 22.0 (SPSS Inc., Chicago IL).
  - Wilcoxon test was used to establish baseline differences in the wheelchair skills test and ASK outcome measures.
  - Due to the poor response rate to the impact questionnaire, not enough data was available to conduct qualitative content analysis as anticipated. The quotes from the impact questionnaire however are used to support the findings of the study.

Results

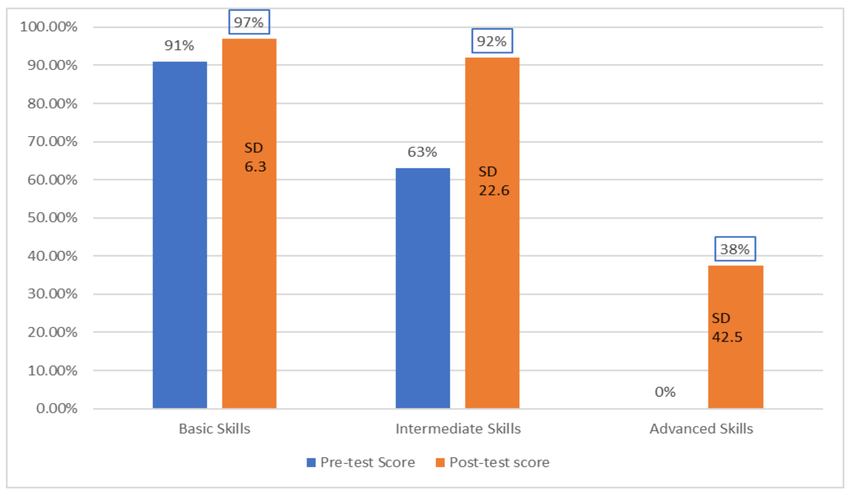
The participants demographic details are presented in in Table 1. Of the eleven participants recruited, eight completed the full programme. One participant opted out mid pre-test, one had to go home prior to his pre-test and another became ill prior to the final post-test and was unable to attend.

Parameter	N=8
Age (years) mean ± standard deviation	10.45 ± 2.84
Gender M:F	5:3
Previous wheelchair training (%)	87.5
Type of school attended (%)	
• Mainstream (%)	75
• Special School (%)	25
Participate in Physical Education in School (%)	100

Table 1: Demographic results

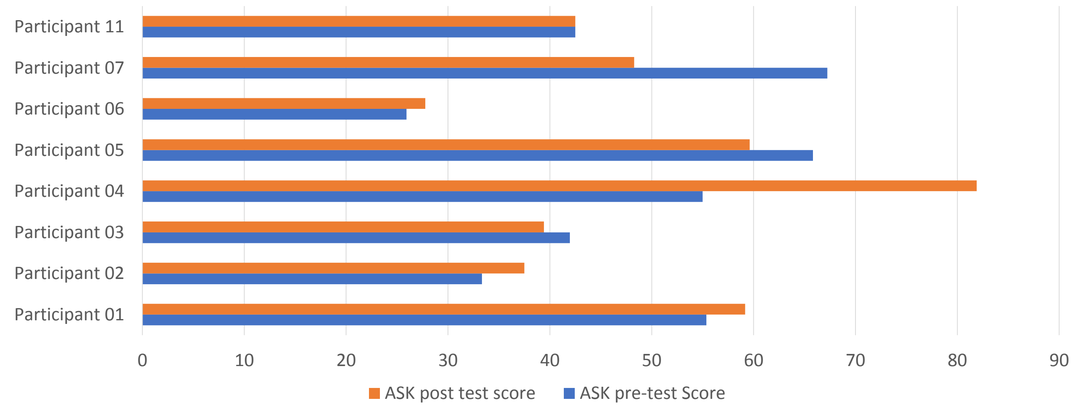
- The results of the manual wheelchair skills test are presented in Figure 1.
- The skills test were stratified into three levels – basic, intermediate and advanced.
- A higher score post-test indicates an increase in skill improvement.
- All participants showed a significant increase across all three levels; basic 6% (p=0.083); intermediate 29% (p=0.17); advanced 25% (p=0.042).
- The greatest increase was observed in the advanced skills level, consisting of locating the balance point, independent back wheel balance and self-protection.

Figure 1: NI Manual Wheelchair Skills Assessment Results



To measure performance in relation to activities of daily living, the Activity Scale for Kids (performance version) was used. Several participants scored lower at post-test than pre-test with an overall 1% increase observed (Figure 2), although not statistically significant. This indicated little to no increase in performance post skills training.

Figure 2: Activity Scale for Kids (ASK) Results



- The impact questionnaire was used to elicit personal perspectives of the skills training programme and a general evaluation of what elements participants benefited from most.
- Due to limitations on the day, only two impact questionnaires were returned to the researcher.
- Overall the research study was very well received by both parents and participants, as shown by some of the comments received.
- Opposite we present some quotes from the participants.

"Better at wheelies – helping to get up over kerbs, going down slopes"

"X practiced the techniques at home to develop her ability to use her chair more confidently"

"I don't mind the wheelchair being tilted back now".

Discussion & Conclusion

- The research study showed a significant improvement in skill level of children aged 5-15 years and the training was positively received by both participants and parents/carers.
- Monthly wheelchair skills training sessions can potentially improve skill acquisition in young manual wheelchair users; training should be ability matched and ongoing throughout the child's development years, particularly in the case of illness where skill regression was observed.
- The NI Manual Wheelchair Skills Assessment tool should be adapted for use with children.
- This research is limited by the small sample size. Future research would be required to include a greater sample size in order to make findings generalisable to the young manual wheelchair user population.

Acknowledgements

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References

[1] YOUNG, N., WILLIAMS, J., YOSHIDA, K. and WRIGHT, J., 2000. Measurement properties of the Activities Scale for Kids . *Journal of Clinical Epidemiology,* **53**(2), pp. 125-137.

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