Upper Extremity Prosthetic Functioning: The Effects of Prosthesis Use and Prosthetic Training on Individuals’ Functional Abilities

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INTRODUCTION

Background
The extent of prosthetic training an individual receives in preparation for the functional use of their prosthesis may be an important determinant of long-term functional ability and satisfaction with upper extremity prosthetics.

- Several studies have supported the idea that prosthetic training leads to improvements in prosthetic functioning. (Boussena et al., 2008; Domholdt et al., 2005; Durance & O'Shea, 1988; Lake, 1997; Weeks et al., 2000)
- However, additional studies have found contradicting results where training did not influence prosthetic use. (Hacking et al., 1997; Roeschlein & Domholdt, 1989)

Purpose
To explore the effects of upper extremity prosthetic use and the provision of prosthetic training on the functional abilities of individuals with an upper extremity amputation.

METHODS

A 40-item questionnaire was developed focusing on a variety of factors regarding individuals' experiences with prostheses and prosthetic training, and included demographics, experiences with prosthetic training and functional abilities.

Questionnaires were mailed through AgrAbility of Wisconsin to 74 individuals with upper extremity amputations ranging from partial hand to forequarter.

Functional differences were compared using a Mann-Whitney U for:
1. Prosthetic users versus non-prosthetic users, and
2. Prosthetic users that received prosthetic training versus those that had not received prosthetic training.

Measures of functional ability:
1. Modified Disabilities of the Arm, Shoulder and Hand (DASH)
   - Individual items: 1 (No difficulty) to 5 (Unable)
   - Total score: 0 (No disability) to 100 (High disability)
2. Self-Efficacy of Functional Abilities with Prostheses
   - Individual items: 1 (Can do) to 4 (Can do but want to do)
   - Total Score: 0 (Highest functional ability) to 100 (Lowest functional ability)

RESULTS

Total sample used was 19 individuals out of 20 total responses (27% response rate). The first analysis broke down these individuals into 2 groups, one group if they indicated current or prior prosthetic use (12) and one group if they have never used a prosthesis (7). The second analysis broke down the prosthesis user group into one group for those that received prosthetic training (5) and another group for those that hadn't received prosthetic training (4). Three individuals were removed from the second analysis due to missing prosthetic training information.

Higher scores are indicative of lower functional abilities.

<table>
<thead>
<tr>
<th>Functional Ranks of Prosthesis vs. Non-Prosthetic User</th>
<th>Functional Ranks of Prosthesis Users with Training vs. No Training</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prosthesis User</td>
<td>Non-Prosthesis User</td>
</tr>
<tr>
<td>Mean Rank Value</td>
<td>Mean Rank Value</td>
</tr>
<tr>
<td>DASH Score</td>
<td>11.00</td>
</tr>
<tr>
<td>DASH Work</td>
<td>9.29</td>
</tr>
<tr>
<td>Module Score</td>
<td>9.14</td>
</tr>
<tr>
<td>DASH Sport/Music</td>
<td>5.17</td>
</tr>
<tr>
<td>Module Score</td>
<td>2.50</td>
</tr>
</tbody>
</table>

IMPLICATIONS FOR PRACTICE

Advancements in prosthetic training are needed to ensure future training meets the functional needs of clients. This can be achieved through:
- Improved focus of training on clients’ specific needs.
- Increased availability and accessibility of training throughout clients’ lives to decrease functional disabilities as they are encountered.
- Further research to improve effectiveness of training techniques.

REFERENCES


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- Robert Meyer, MS, and AgrAbility of Wisconsin for support and participant recruitment.
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