GRASP: A Program for Improving Upper Extremity Function

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GRASP: A Program for Improving Upper Extremity Function

Rachel Marquardt & Sarah Eckert | Western Michigan University

1 Ask: Research Question

What is the effectiveness of the GRASP (Graded Repetitive Arm Supplementary Program) for improving ADL function for individuals within one month post-stroke?

What is GRASP?

GRASP is an exercise program for upper extremity rehab following neurological injury. The program is taught by the therapist and then completed as a “homework-based program.” Manuals exist for the Hospital and Home setting and include instructions for the exercises. Most of the activities use objects commonly found around the house.

2a Acquire: Search Terms

**Databases:** SCOPUS, ClinicalKey, PubMed  
**Search Terms:** “graded repetitive arm supplementary program”

P: Individuals within one month post-stroke  
I: Receiving the GRASP as intervention  
C: Receiving typical therapy  
O: ADL function

2b Acquire: Selected Articles

**Study 1:** Harris, J., Eng, J., Miller, W., & Dawson, A. (2009) A multi-site randomized control trial (RCT) of the GRASP for individuals in inpatient rehabilitation facilities.

**Study 2:** Murdolo, Y., Brown, T., Fielding, L., Elliott, S., & Castles, E. (2017) A mixed-methods study evaluating outcomes for stroke survivors in the acute care setting and their experience using the GRASP.

**Study 3:** Pang, M., Harris, J., & Eng, J. (2006) An RCT of the early GRASP approach in a community-based group setting.

3a Appraise: Study Quality

<table>
<thead>
<tr>
<th>Study 1 – Level II (N = 103)</th>
<th>Study 2 – Level III (N = 8)</th>
<th>Study 3 – Level II (N = 63)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strengths: RCT, reliable/valid assessment tools, single-blind design, large sample size, standardized protocols developed, high participant satisfaction.</td>
<td>Strengths: mixed-methods design, reliable/valid assessment tools, diverse sample, data saturation achieved.</td>
<td>Strengths: RCT, single-blind design, reliable/valid assessment tools, structured protocol, severity assessed, high participant satisfaction, long term follow up.</td>
</tr>
<tr>
<td>Limitations: short intervention duration (4 weeks), severity not considered, possible Hawthorne effect, longitudinal effects not examined.</td>
<td>Limitations: convenience sample, no randomization or control group, small sample size, highly structured interviews, longitudinal effects not examined, environmental factors not controlled.</td>
<td>Limitations: different baselines between groups, poor training protocol, homogeneous sample, small sample size, upper extremity exercises utilized instead of GRASP.</td>
</tr>
</tbody>
</table>

3b Appraise: Study Results

**Study 1:** Within acute rehab settings, the GRASP group scored significantly higher than the control group on the Chedoke Arm and Hand Activity Inventory (CAHAI-9) (p<.001), the Action Reach Arm Test (p=.025), grip strength (p=.027), the Motor Activity Log (MAL) amount of use scale (p=.023), and the MAL quality of movement scale (p=.007).

**Study 2:** Within the hospital, clinically significant change scores on the CAHAI-9 (Z=2.380, p=.017), Upper Limb subscales of the MIS Assessment Scale (Z=2.176, p=.030), Stroke Impact Scale (SIS) 3.0 physical dimension (Z=2.521, p=.012), SIS 3.0 subscales for strength (Z=1.829, p=.067), ADLs/ADLs (Z=2.325, p=.012), and hand function (Z=1.265, p=.206). Qualitative data also supported the GRASP for ease of use and perceived benefit.

**Study 3:** Following the RCT in a community based setting, participants within the upper extremity exercise group demonstrated significant improvement in ADL function on the Wolf Motor Function Test (p=.003) and the Fugl-Meyer Assessment (p=.001) when compared to the control group.

4 Apply: Implications for Practice

Use of the GRASP improved ADL function for individuals experiencing hemiplegia post-stroke. Study participants demonstrated clinically significant improvements in ADL function as evidenced by post-assessment scores following the program. These improvements may be a result of increased time spent rehabilitating their affected upper extremity or the structured approach of GRASP. Severity and time since onset may also be factors. The program is inexpensive and easy to follow, which may be appealing to therapists in multiple settings.

Future studies should evaluate precise time needed to show results. More rigorous designs to assess longitudinal impact and compliance rates are needed. Improvements to the GRASP could include an additional instructional medium, such as videos. Additionally, studies directly comparing GRASP to other commonly used neurological approaches, like Constraint Induced Movement Therapy or mirror therapy, or neurological impairments, like TBI, would be beneficial to represent effectiveness and/or generalizability.

GRASP may improve ADL function in those experiencing recent hemiplegia post-stroke in acute care, inpatient rehab, and community-based settings.

**References**


