Participation and Physical Function following Traumatic Brain Injury

Alison M. McLean, BSc (OT), MSc (Candidate), OT(C)
Dana Anaby, BOT, PhD
Tal Jarus, BOT, MA (OT), PhD, OT(C)

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Purpose

To examine:

1. participation patterns of community-dwelling adults with traumatic brain injury (TBI)

2. the association between physical function and participation
Primary goals of TBI rehabilitation:

- Return to active and purposeful roles and activities at home and in the community\textsuperscript{1,2}
- Restoration of quality of life\textsuperscript{3}

\textbf{**Limited focus to date on the community phase**}
What is community integration or “participation”?

- Early concept:
  level of functional independence in home, social and productive activities

- International Classification of Function (ICF):
  involvement in a life situation
What is community integration or “participation”? 

- Participation includes\textsuperscript{6-11} (beyond functional independence):
  - preferences and interests
  - satisfaction, enjoyment
  - consideration of where participation occurs
  - frequency and intensity
  - motivation to change
  - availability of support and opportunities
Participation and individuals with TBI

- low rate of return to work\textsuperscript{12-14}

- reduced involvement in leisure activities; fewer social encounters, friends, social outings\textsuperscript{15-19}
Work/home/social balance

Doig (2001)  
- High work, but low social & home (38%)
- Balanced (22%)
- Poor integration (work, social, home) (40%)

Winkler (2006)  
- High integration (balanced) (55%)
- Low integration (45%)
International Classification of Function, Disability and Health (ICF)

Health condition
(disorder or disease)
- more severe TBI

Body Functions and Structures
- depression
- behaviour
- cognitive impairment

Activities
- level of functional independence

Environmental Factors

Participation
- education/employment status
- income
- age
- psychiatric history or substance abuse

Personal Factors

Level of functional independence

- depression
- behaviour
- cognitive impairment

Participation
- education/employment status
- income
- age
- psychiatric history or substance abuse
International Classification of Function, Disability and Health (ICF)

Health condition (disorder or disease)
- more severe TBI

Body Functions and Structures
- depression
- behaviour
- cognitive impairment
- physical impairment?

Activities
- level of functional independence
- physical activity performance?

Environmental Factors

Personal Factors
- education/employment status
- income
- age
- psychiatric history or substance abuse

Participation
Aims of the study:

1. To describe participation patterns of individuals with TBI living in the community

2. To investigate the relationship between physical function (in terms of body function and activity performance) and participation
Methods

- Cross sectional design

- Community-dwelling adults with TBI, n=32
  - at least 6 months post injury
  - no evidence of receptive aphasia

- UBC ethics approval
<table>
<thead>
<tr>
<th>Subject characteristics</th>
<th>Questionnaire</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>- Neurobehavioural Status Examination (Cognistat)</td>
</tr>
<tr>
<td>Physical function: body structure &amp; function</td>
<td>Fugl-Meyer Assessment of Motor Recovery (FM)</td>
</tr>
<tr>
<td>Physical function: activity</td>
<td>Chedoke Arm and Hand Activity Inventory (CAHAI-9)</td>
</tr>
<tr>
<td>Participation</td>
<td>Adult Subjective Assessment of Participation (ASAP)</td>
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</tbody>
</table>
Adult Subjective Assessment of Participation (ASAP)

43 activities in 7 categories:
- Physical activities and sports
- Activities with children
- Learning and applying knowledge
- Quiet activities
- Entertainment and recreation
- Self care and care of others
- Activities with children

Scales:
- Diversity
- Frequency/intensity
- Enjoyment
- Satisfaction w/ performance
- With whom
- Where
- Assistance required
# Results: subject characteristics (N=32)

<table>
<thead>
<tr>
<th>Category</th>
<th>Details</th>
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<tbody>
<tr>
<td>Gender</td>
<td>Male: n=25    female: n=7</td>
</tr>
<tr>
<td>Cause of TBI</td>
<td>Motor vehicle accident =25 (78.2%)</td>
</tr>
<tr>
<td>Employment</td>
<td>23 (71.9%) not employed</td>
</tr>
<tr>
<td>Cognition</td>
<td>Impaired memory: n = 19 (59%)</td>
</tr>
<tr>
<td>Mobility</td>
<td>Use of mobility aids: n=7 (22%)</td>
</tr>
<tr>
<td>Length of hospital stay</td>
<td>35-730 days (M=196.4, SD=172.5)</td>
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<tr>
<td>Time since injury</td>
<td>1-30 years (M=8.43, SD=8.75)</td>
</tr>
<tr>
<td>Current age</td>
<td>22-57 years (M=29.3, SD=9.5)</td>
</tr>
</tbody>
</table>
Results: participation patterns

Diversity (%)

- Physical activity & sport
- Activities with children
- Learn/apply knowledge
- Quiet activities
- Entertain/recreation
- Self-care
- Domestic life

Frequency/Intensity

- Physical activity & sport
- Activities with children
- Learn/apply knowledge
- Quiet activities
- Entertain/recreation
- Self-care
- Domestic life
Results: participation patterns

Enjoyment

Satisfaction w/ performance

Activities: Phys activ & sport, Activ with children, Learn/apply knowledge, Quiet activities, Entertain/recreation, Self care, Domestic life
## Results: participation patterns

<table>
<thead>
<tr>
<th>With Whom</th>
<th>Majority of activities performed alone (58%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Where</td>
<td>Largest proportion performed at home (43%)</td>
</tr>
<tr>
<td>Assistance Required</td>
<td>Mean scores range between ‘partial assistance’ and ‘no assistance’</td>
</tr>
</tbody>
</table>
Results: physical function and participation

- Impairment:
  - FM scores: 16 to 66 (out of 66) (M=59.87, SD 10.31)
  - Correlation with participation (ASAP) = negligible

- Activity:
  - CAHAI scores: 36 to 63 (out of 63) (M=58.77, SD=6.15)
  - Correlation with participation (ASAP) = negligible
Discussion and Conclusion

1. To describe participation patterns of individuals with TBI living in the community

- Similarities with other studies:
  - Lower participation in social leisure activities outside of home

- Additional information about participation patterns:
  - Diversity: domestic activities the highest (but lowest enjoyment and satisfaction with performance)
  - Frequency: quiet activities the highest
  - Proportionally more time at home, and alone

- Differing (?) results from other studies:
  - Measurement of satisfaction\(^{32}\)
2. To investigate the relationship between physical function and participation

   ◦ Overall, no association found
     (only some isolated and low correlations)
Clinical implications

Pay attention to patterns of participation, beyond level of functional independence:

- diversity
- frequency & intensity
- enjoyment
- satisfaction with performance
- where participation occurs
- with whom
Consider factors other than physical function:

- Psychosocial status
- Management of behaviour
- Cognitive rehabilitation
- Social, physical environment
Limitations

- Relatively small sample size; but similar characteristics to subjects of much larger studies (although may be higher unemployment)

- Limitations for generalization

- Physical function and participation:
  - Not all aspects of physical function were measured
  - Only physical function was considered
Thank you!

- BC Medical Services Foundation
- Canadian Institutes of Health Research
- Canadian Occupational Therapy Foundation
Questions?
References

References


References


