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REVIEW ARTICLE (META-ANALYSIS)

Community Integration After Traumatic Brain Injury: A Systematic Review of the Clinical Implications of Measurement and Service Provision for Older Adults

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Abstract

Objective: To explore the scope, reliability, and validity of community integration measures for older adults after traumatic brain injury (TBI).

Data Sources: A search of peer-reviewed articles in English from 1990 to April 2011 was conducted using the EBSCO Health and Scopus databases. Search terms included were *community integration*, *traumatic brain injury* or *TBI*, *65 plus* or *older adults*, and *assessment*.

Study Selection: Forty-three eligible articles were identified, with 11 selected for full review using a standardized critical review method.

Data Extraction: Common community integration measures were identified and ranked for relevance and psychometric properties. Of the 43 eligible articles, studies reporting community integration outcomes post-TBI were identified and critically reviewed. Older adults' community integration needs post-TBI from high quality studies were summarized.

Data Synthesis: There is a relative lack of evidence pertaining to older adults post-TBI, but indicators are that older adults have poorer outcomes than their younger counterparts. The Community Integration Questionnaire (CIQ) is the most widely used community integration measurement tool used in research for people with TBI. Because of some limitations, many studies have used the CIQ in conjunction with other measures to better quantify and/or monitor changes in community integration.

Conclusions: Enhancing integration of older adults after TBI into their community of choice, with particular emphasis on social integration and quality of life, should be a primary rehabilitation goal. However, more research is needed to inform best practice guidelines to meet the needs of this growing TBI population. It is recommended that subjective tools, such as quality of life measures, are used in conjunction with well-established community integration measures, such as the CIQ, during the assessment process.

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Population proportions and the absolute number of people aged ≥65 years, referred to in this article as older adults, are continuing to increase in many countries worldwide.[1] Falls and consequent injuries are one of the most costly issues associated with the aging population with at least 30% of people aged ≥65 years falling each year, a third of which result in serious injury impacting on function.[2,3] Accidental falls are the primary cause of traumatic brain injury (TBI) for older adults.[4]

The age-adjusted rate of hospitalization for TBI in older adults is 155.9 per 100,000, over double that of the general population (60.6 per 100,000 population). Those ≥75 years have the highest rates of TBI-related hospitalization and death.[4] Given the aging demographic, the incidence of falls and fall-related TBI and demands on rehabilitation services are expected to rise. Evidence suggests that community integration (CI) should be the primary goal of rehabilitation for people after a TBI[5,6] because CI is an adaptive process of rehabilitation that is multidimensional,

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dynamic, personal, and culturally bound[5,6] and is linked to concepts of handicap and social participation.[5,6] Definitions of CI typically include social, community, and in-home participation and participation in meaningful, productive activities.[6,7]

Reistetter and Abreu[5] investigated methods of measuring CI and CI outcomes for post-TBI populations, though their inquiry pertained to adults ≥19 years. There is limited literature on identifying and meeting the CI needs of older people who have sustained a TBI. There is evidence to suggest, however, that advancing age is associated with poorer outcomes after TBI.[8] This association could be because of measurement issues, where existing measures fail to adequately assess the CI needs of older adults after TBI, or it could in fact be a true reflection of outcomes after TBI for older people. Therefore, a critical review of the literature was conducted to explore the measures used and older adults' CI needs after TBI.

Methods

A systematic literature search was conducted using the EBSCO Health and Scopus databases. To further identify older people's needs after TBI, secondary searches for qualitative studies were conducted on ProQuest Social Science Journals, Sociology: A SAGE Full-Text Collection and Expanded Academic ASAP. However, no additional qualitative studies were found. The search terms used were as follows: *community integration*, *community reintegration*, *older adult*, *elderly*, *geriatric*, *traumatic brain injury*, *assessment*, *measure*, and *qualitative*. Common synonyms were used, as were common acronyms for measures, and truncation was used where appropriate. Boolean combinations and separate keywords were also used. For example, *community integration* AND *older adult*, or *older adult* OR *elderly*. Supplementary searches were conducted on SCOPUS for the following named measures: the Participant Objective, Participant Subjective (POPS), Satisfaction with Life Scale (SWLS), Dartmouth COOP Functional Health Assessment Charts/WONCA (COOP), RAND Medical Outcomes Study 36-Item Short-Form Health Survey (SF-36), and the Sickness Impact Profile-68. Searches were limited to full-text English language articles published in peer-reviewed journals from 1990 to April 2011. There was no attempt to retrieve information from unpublished articles to ensure that all studies we reviewed had gone through a rigorous peer-review process. A total of 152 articles was accessed by the first author (L.R.) and reviewed for appropriateness to the research topic. Forty-three published articles met the inclusion criteria.

Studies reporting older adults' needs post-TBI, with participants aged ≥65 and using CI outcome measures, or studies reporting or reviewing CI assessments, were included. Studies not reporting relevant age-specific findings were excluded. No criteria for methodologic design or TBI severity were specified. Because of the scarcity of studies investigating CI for older adults who had sustained a TBI, imposing further limits on injury severity was avoided. Ethical approval was not required for this literature review.

The first author (L.R.) critically appraised and scored the 43 selected research articles using either the Critical Review Form—Quantitative Studies or the Critical Review Form—Qualitative Studies designed by Law et al[9] (table 1). These tools have been used extensively in rehabilitation research reviews[10,11] to determine and compare methodologic quality. For every question indicative of good methodologic quality, a yes response was scored 1 and a no or not addressed response was scored a 0 (see table 1). A total score was generated for each of the 43 reviewed articles. One previously scored quantitative article was randomly selected and independently rated by the authors to determine scoring accuracy. This revealed a difference of 2 marks among all 4 reviewers. Differences were discussed and an agreement was reached that there should be a blanket penalty for unaddressed responses in studies, regardless of applicability. A second randomly selected quantitative article was then scored. There was a difference of 1 mark among all 4 reviewers for the second study cross-scored. Further discussion led to consensus about the application of the standardized appraisal system. All of the 11 studies were then scored by 1 author (J.K.), and there was total agreement between the first author (L.R.) and the scores of the second reviewer (J.K.) for all 11 studies. Based on a previous review that denoted quantitative studies that scored between 7 and 10 as moderate quality,[12] it was determined that ≥10 out of 15 (>66%) would be used to define good quality. Similarly, ≥16 out of 24 was used to define good quality qualitative studies. Eleven

List of abbreviations:

CHART	**Craig Handicap Assessment and Reporting Technique**
CI	**community integration**
CIM	**Community Integration Measure**
CIQ	**Community Integration Questionnaire**
COOP	**Dartmouth COOP Functional Health Assessment Charts/World Organization of National Colleges, Academies, and Academic Associations of General Practices/Family Physicians**
GCS	**Glasgow Coma Scale**
POPS	**Participant Objective, Participant Subjective**
SF-36	**Medical Outcomes Study 36-Item Short-Form Health Survey**
SWLS	**Satisfaction with Life Scale**
TBI	**traumatic brain injury**
WHOQOL-BREF	**World Health Organisation Quality of Life-Abbreviated 26 items**
WHOQOL-DIS	**World Health Organization Quality of Life-Disabilities module**
WHOQOL-OLD	**World Health Organization Quality of Life-Older Adult module**

Table 1 Critical appraisal scoring system

Quantitative Research	Maximum Score	Qualitative Research	Maximum Score
Study purpose	1	Study purpose	1
Literature	1	Literature	1
Design	1	Design	3
Sample	2	Sampling	3
Outcome	2	Descriptive clarity	4
Intervention	3	Procedural rigor	1
Results	4	Analytical rigor	2
Conclusions and implications	1	Auditability	2
		Theoretical connections	1
		Trustworthiness	4
		Conclusions and implications	2
Maximum score	15		24