

**TITLE: Developing a comprehensive framework of community integration for people with acquired brain injury: A conceptual analysis.**

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## ABSTRACT

### Purpose:

Despite increasing emphasis on the importance of community integration as an outcome for acquired brain injury, there is still no consensus on the definition of community integration. The aim of this study was to complete a concept analysis of community integration in people with acquired brain injury.

### Materials and Methods:

The method of concept clarification was used to guide concept analysis of community integration based on a literature review. Articles were included if they explored community integration in people with acquired brain injury. Data extraction was performed by the initial coding of (i) the definition of community integration used in the articles, (ii) attributes of community integration recognized in the articles' findings, and (iii) the process of community integration. This information was synthesised to develop a model of community integration.

### Results:

Thirty-three articles were identified that met the inclusion criteria. The construct of community integration was found to be a non-linear process reflecting recovery over time, sequential goals, and transitions. Community integration was found to encompass six components including: independence, sense of belonging, adjustment, having a place to live, involved in a meaningful occupational activity and being socially connected into the community. Antecedents to community integration included individual, injury-related, environmental and societal factors.

### Conclusion:

The findings of this concept analysis suggest that the concept of community integration is more diverse than previously recognised. New measures and

rehabilitation plans capturing all attributes of community integration are needed in clinical practice.

Keywords: Community integration, concept analysis, acquired brain injury, concept clarification, framework

## INTRODUCTION

Acquired brain injury (ABI) is an injury to the brain after birth that can occur as a consequence of trauma, stroke, hypoxia, tumour, infection, substance abuse or degenerative neurological disease [1]. People with ABI typically experience a wide range of deficits including physical, communicative, cognitive, behavioural, and psychological impairments. They also frequently face limitations in activities and restrictions on participation affecting functional independence, social integration and return to work that may persist for many years [2]. Due to the long-term nature of difficulties following an ABI, medical and rehabilitation services should extend beyond the acute care phases and have their optimal goal as longer-term community integration [3]. Community integration has been defined as "active participation in a broad range of community involvements" [4]. In colloquial terms, community integration can be explained as "having something to do, somewhere to live, and someone to love" [5]. Similarly, Dijkers [6] defined community integration as acquiring a social role, independent living, and engagement in a productive activity in the least restrictive environment which can be represented as institutionalization or community living with varying degree of available support. Therefore, understanding the concept of community integration is important to assess clinically significant change in rehabilitation [6,7].

The community integration construct was developed from the World Health Organization's (WHO) International Classification of Impairment, Disability and Handicap (ICIDH), based on the concept of 'handicap' [8] which was viewed as the opposite of integration. The term 'handicap' has now been replaced with the concept of 'participation' in the newer WHO International Classification of Functioning (ICF) in which the term participation has been introduced and defined under the domain 'Activity (capacity) and Participation (performance)' [9]. The ICF definition of participation as "involvement in a life situation" offers little knowledge regarding type and level of involvement and life situation concerned. Arguably, the ICF addresses 'participation' through objective indicators of observed performance with the exclusion of subjective experiences of participation in major life areas [10]. A study that investigated the appropriateness of the ICF as a standardised framework for operationalising the construct of community integration reported that the ICF focuses on only objective aspects of the construct [7]. Furthermore, community integration notably extends beyond physical performance and basic activities of daily living to include broader subjective aspects of life such as quality of performance, acceptance, satisfaction, decision making, and control of life [11,12] which are largely missing from the ICF Participation component [10, 13]. Therefore, despite conceptual similarities between participation and community integration, the latter should be explored and operationalised as a related yet distinct concept.

There has been a substantial increase in the past decade in research aiming to further define the construct of community integration and operationalise it in measurement terms. Publications on community integration propose several characterisations including three common components:

physical independence, interpersonal relations, and engagement in meaningful vocational activity [8,11,14,15,16]. Additionally, belonging to the community, coping with the situation, returning to previous roles and safeguarding against risk are also identified as elements of community integration [11,14]. This reflects the multidimensional and complex nature of the construct. However, a standardised operational model of the construct of community integration incorporating current findings has not yet been articulated [17,18].

Outcome measurement tools are crucial to establish the effectiveness of rehabilitation interventions and thus contribute to the process of clinical decision-making [19]. A number of measures have been developed and applied to the measurement of community integration, based on different conceptual frameworks and emphasizing different dimensions and components [18,20]. It is recommended to take an integrative approach to operationalize and measure the construct of community integration, incorporating both objective indicators and subjective experiences [7,10,21]. Existing instruments can broadly be divided into two distinct groups: objective/observational measures (what do people with disability do; e.g. frequency of the activity a person performs in a day) such as the Community Integration Questionnaire (CIQ) [8]; and subjective experience-based measures (how people *feel* about what they do or cannot do; e.g. the feeling of being accepted or connected in the community) such as the Community Integration Measure (CIM) [11]. Instruments with different titles or names add to the confusion of the concept of community integration (e.g. Sydney Psychosocial Reintegration Scale, Personal Integration Inventory) [6]. These results reflect considerable variation in the definition and measurement criteria of the multi-faceted and broad concept of community integration, making it difficult to generalise or compare community integration across different injury groups or research results. To resolve these problems, a more robust framework needs to be articulated to inform outcome measurement for community integration of people with ABI.

Concept analysis may be a useful strategy to clarify a concept, and to develop a stronger theoretical model of the construct for clinical as well as research purposes [22,23]. This article reports the findings of a concept analysis of community integration in adults with ABI. The key aims and objectives of the analysis were: 1) To clarify the concept of community integration in persons with ABI, 2) To identify attributes, antecedents, and processes of the concept community integration, and 3) To synthesize the findings of the analysis to inform the development of a robust conceptual framework of community integration.

## **METHODS**

Concept analysis refers to the process of exploring, unravelling, and delineating concepts. The current review utilized one of the concept analysis technique of concept clarification described by Morse and colleagues. It is the most appropriate method when a concept is partially mature [22,24]. Here community integration is considered as a partially matured concept as it does not have a clear universal definition, well-described attributes, boundaries, preconditions and outcomes according to the criteria outlined by Morse [24]. Whilst there has been extensive research around the concept of community integration after ABI there still are numerous definitions and multiple explanations that make the concept less clear. The technique of concept clarification facilitates development and refinement of the term under investigation by synthesizing the available literature to identify the concept's attributes, preconditions, and outcomes [24]. This process incorporates critical appraisal of

the existing research, coding of the data derived from the literature, and analytic questioning of the literature.

### ***Search Strategy***

The search strategy development and review were done in consultation with the health sciences librarian at the Auckland University of Technology. An extensive literature search using EBSCO (including CINAHL, MEDLINE, and PsycINFO), and SCOPUS was conducted. All relevant resources containing key terms such as acquired brain injury, brain injury, head injury, community integration, community reintegration, community re-entry, community participation, socialization, social integration, social participation, return to work, work participation, transition home, and in adult population were examined. Reference lists of all resources meeting study criteria were hand searched for any supplemental studies that may not have been revealed in the electronic database search. Studies included in the search were published between October 1989 and December 2016.

### ***Inclusion/exclusion criteria***

Articles using both qualitative and quantitative methods were included if they reported a study that sought to explore community integration, identified community integration as a key finding and were published in English language journals. Articles were excluded if the content was not relevant to community integration. Studies involving populations other than adult ABI were not included as the mechanism, pathophysiology, rehabilitation goals, pattern of recovery, immediate and long-term outcomes are likely to differ. Only studies on adults (>16 years) were included due to different models of care between adult and paediatric services [25,26,27]. Additionally, rehabilitation guidelines for children and adolescents are provided under a separate ICF framework: ICF-CY. Hence, we believe community integration should be conceptualised differently for youth with ABI. Also, articles exploring perspectives of only healthcare professionals, family, and caregivers that did not involve persons with ABI were excluded as the perspective of adults with ABI were the primary focus of this study.

### ***Data selection***

All articles were screened for eligibility based on their titles and abstracts. A full-text copy was retrieved for each article that was considered possibly meeting the inclusion criteria or when relevance could not be confirmed by the title or abstract. These were then reviewed to determine their eligibility for inclusion by the first author (N.S.) who was primarily responsible for data collection. When there was uncertainty about the eligibility of an article, the decision was collaborated by the co-authors R.S. and P.K. The fourth author A.T. arbitrated in cases of disagreement and a consensus regarding eligibility was reached through discussion.

### ***Data analysis***

Each included article was read multiple times to develop a thorough understanding of the topic. Data extraction was performed by the initial coding of information which included: definitions of

community integration, attributes of community integration, conceptual or operationalised frameworks and the process of community integration. Such coding practice was instructed by Morse [24] in order to assess or achieve maturity of the concept concerned. These findings were arranged onto separate matrices to compare similarities and differences across studies, including identification of areas with limited knowledge on the topic. These matrices formed the basis for synthesis and identification of key attributes of community integration after ABI and ultimately the development of the conceptual model of community integration. The data analysis was primarily conducted by the first author (N.S.), and the emerging concept and attributes were frequently reviewed by the co-authors (R.S., P.K., and A.T.) for consistency. The proposed model was also presented at two different conferences to a group of approximately 30 health care and community support professionals, healthcare service providers, funders as well as people with personal experience of ABI with opportunities to verify the findings. Feedback from the peer-review was taken into consideration and components of the model were ameliorated.

## RESULTS

The systematic literature search process and outcome are outlined in **figure 1**. The search of electronic databases retrieved 2,337 articles in total. Following an initial title and abstract review, 48 articles were identified as possibly meeting the inclusion criteria of the study. Review of these 48 full-text articles identified 28 articles that were included in this concept analysis. Hand searching the reference lists of these articles yielded an additional five articles.

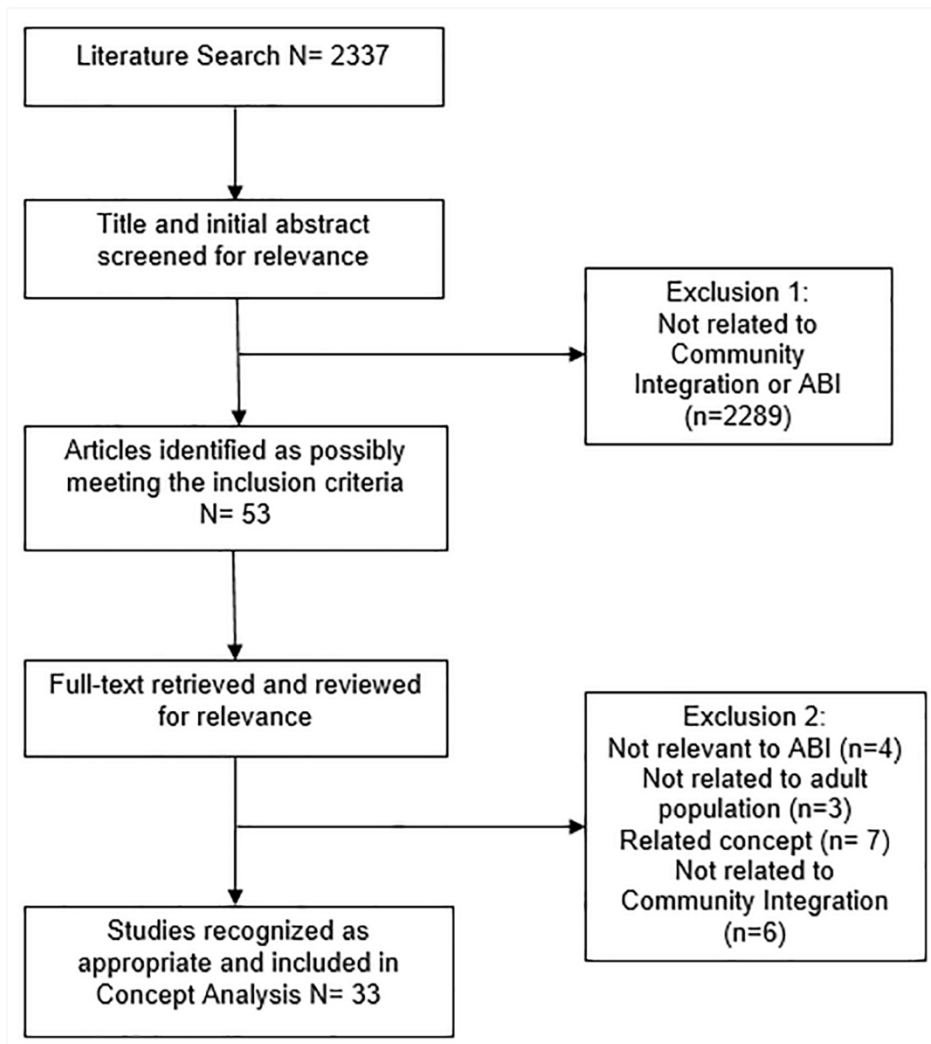


Figure 1: Systematic search strategy for concept analysis of community integration.

### ***Study designs***

The selected papers represent review studies (1), and studies based on experimental design (1), qualitative (19), quantitative (10) and mixed method (2) approaches. Of the qualitative studies, there were two grounded theory designs [28,29], three phenomenological approaches [11,30,31], one focus group [8], one Delphi method [14], five qualitative descriptive studies using semi-structured interviews [32,33,34,35,36], and one qualitative case study [37]. Two studies employed a mixed-methods approach [15,38]. Six of the studies provided qualitative descriptions of existing community integration literature [18,20,39,40,41,42], while only one study reported a systemic review [43]. There were 10 quantitative studies of cross-sectional, longitudinal design reporting community integration outcomes, predictors or correlations with other constructs [12,16,17,44,45,46,47,48,49,50]. Only one study presented an experimental design with pre and post-intervention outcomes [51]. A summary of the 33 included articles is presented in **table 1**.



### ***Participant characteristics***

Of the 33 included studies, 4 concerned people with stroke; 16 concerned people with TBI and the remainder were related to mixed ABI populations (**table 1**). The perspectives of adults who experienced an ABI, family caregivers and professionals and policymakers as well as healthy individuals as a normative sample group were represented. Sample sizes of included studies ranged from 1 [40] to 1973 [48]. The information regarding the severity of injury and symptoms is missing from some of the existing research [44,28,35,36,38], however, included ABI samples represented mild to severe injury levels living in a range of supported and non-supported community settings.

Table 1: Summary of included articles

Author	Purpose of study	Methodology/ methods	Participant information (N)	Core findings of conceptual review			
				Definition	Attributes or components	Process	Outcome
1989 Tate et al. [16]	Examined the extent of overall psychosocial disability, and measured and compared psychosocial outcome for the survivors of severe blunt head injury	Prospective longitudinal study	N=87 Blunt head injury	Not specified as study did not seek to explore community integration	Psychosocial disability was classified as: 1) Vocational and avocational pursuits; 2) The ability to form and maintain significant interpersonal relationships; and 3) Functional independence (that is, the ability to live independently).	Enhanced psychosocial reintegration can be achieved by opportunities for re-entry in the vocational/ avocational areas.	Remedial/support services are required post-discharge to help patients taking charge of their own life.
1993 Willer et al. [8]	Described consumer-based model of community integration and developmental framework & initial validation of the Community Integration Questionnaire (CIQ)	Focus group, cross-sectional study	1) N=14 Professionals 2) N=49 Moderate-severe brain injury patients; 3) N=16 Moderate-severe brain injury patients (4) N=94 Model system sample; N=352 Community samples with TBI; N=237 Nondisabled samples	Defined Community Integration based on Handicap Model of the ICF: "integration into a home-like setting, integration into a social network, and integration into productive activities such as employment, school or volunteer work."	1. Home Integration 2. Social Integration 3. Productive Activity	Not a focus of this study.	Community integration of an individual can be described as combination of all three areas (home, social, and productivity) at some level.

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1998 McColl et al. [11]	Defined community integration and developed a framework and operationalised model of community integration in TBI population. 18 adults from supported living programme were followed for 1 year and evaluated their level of community integration	Qualitative analysis informed by phenomenology, intensive semi-structured interviews	N= 116 Moderate to severe brain injury living in the community N= 18 TBI living in supported living followed for 1 year	Community integration includes independence in individual's living situation (independent living), relationships with others (social support), and activities to fill one's time (Occupation).	Community integration was a multi-faceted construct operationalised as: general integration, independent living, occupation and social support that include orientation, acceptance, conformity, close and diffuse relationships, living situation, independence, productivity and leisure.	Not a focus of this study	Positive outcomes achieved in individuals free from formal supervision.
1998 Burleigh et al. [44]	Examined relationship between community integration and Life satisfaction	Descriptive correlational cross-sectional design	N= 30 TBI with age range from 26 to 60 years	Social integration was referred to as a successful acquisition of a society role and adaptation of community living skills	Social integration is a vital subtype of community integration.	Not a focus of this study	Social integration, component of community integration, was positively correlated with life satisfaction.
2000 Trigg & Wood [15]	Developed a brief, self-report measure of social integration following stroke	Mixed methods	N= 264 Stroke, six months post-injury	Social integration was considered as perceived level of activity and integration.	(1) Activities (2) Interaction, and (3) Environment.	Not a focus of this study	Quality and quantity of the level of community integration reflect individual's ability to re-integrate into the society to his/her satisfaction.
2004 Sloan et al. [40]	Examined outcome literature and theoretical models of TBI and illustrated the Community Approach to Participation (CAP) in the detailed case study	Literature review, case study	N= 1 TBI case study of Sarah	The concept was considered as acceptance of people with disability in their local community.	Community integration was described in four dimensions: Independent living, return to employment or study, inclusion in society and participation in leisure activities.	Community approach to participation includes: 1. Maximise participation in valued life roles in home or community. 2. Social support; 3. Meaningful occupation; 4. Self-confidence and empowerment in everyday decisions and life choices; 5. Activity independence; 6. Satisfaction with changed life.	When a long term systematic Community Approach to Participation is applied with clinical expertise, significant increase in community integration and satisfaction with life can be achieved in people with TBI.

Author	Purpose of study	Methodology/ methods	Participant information (N)	Core findings of conceptual review			
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2005 Reistetter & Abreu [39]	Examined evidence to determine the best outcome measure and predictors of community integration and explored relationship between community integration and quality of life and life satisfaction	Systematic review of the literature	TBI	Community integration was an adaptation process that was multidimensional, dynamic, personal and culturally bound. It was referred as an opportunity to have a place to live, maintain relationships and social network and be involved in a productive activity.	Severity of injury, age and gender, education and employment level prior to the injury, living arrangement, cognitive and emotional status, functional performance, and disability have been considered as prominent predictors of community integration.	Not a focus of this study	Community integration has an effect on life satisfaction whereas strong connection between community integration and quality of life has not been established.
2006 Winkler et al. [34]	Assessed and identified predictive factors of community integration of people 3 to 15 years after severe TBI	Qualitative study, semi-structured interviews	N= 40 Severe TBI (average=8.8 years post-injury)	Referred to the definition given by McColl et al. (1998)	Not a focus of the study.	Not a focus of this study	Demographic factors, severity of injury, activity limitation at discharge, behavioural challenges, and social support are key predictors of community integration outcomes.
2007 McCabe et al. [43]	Examined the interventions and strategies utilised to facilitate transition from acute rehabilitation care to the community after brain injury	Systematic review	ABI	Community integration is a multidimensional concept which includes aspects of human functioning such as independence, social relationships, productivity, and leisure.	Better community outcomes depend on positive results in areas of social, emotional, occupational integration and functional independence.	The transition process from rehabilitation to community greatly involves independence and social integration, caregiver burden, satisfaction with quality of life, return to work and return to driving.	Community integration was associated with structured cognitive rehabilitation of patient as well as support person.
2007 Cott et al. [41]	Described the process of continuity, transition, and participation following stroke and issues that survivors face on their return to the community living	Descriptive qualitative analysis of the literature	Stroke	Referred to the definition given by McColl et al. (1998)	The concept of community integration constituted an understanding of nature of the community, the notion of interdependence and client-centeredness. Satisfaction and empowerment that allows one to make choices determine successful integration.	It was described as continuity in person's experience of one's life post-injury and transition from non-disabled to disabled self, include return to meaningful roles and activities.	Not a focus of this study

Author	Purpose of study	Methodology/ methods	Participant information (N)	Core findings of conceptual review			
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2007 Turner et al. [31]	Explored the transition experiences from hospital to home of a purposive sample of individuals with ABI	Phenomenological, qualitative design	N= 13 ABI (TBI and other ABI e.g., stroke, hypoxic injury, etc.) N= 11 Family caregivers	Not specified as study did not seek to explore community integration	Not a focus of this study	Transition phase was characterized by the development of greater self-awareness of deficits. Participants experienced shock upon returning home due to discrepancy between their pre-discharge life-expectations to be 'normal' and real-life experiences.	Heightened self-awareness was reported to result in emotional distress and depression. Major source of successful transition was availability of adequate support from the family.
2008 Lefebvre et al. [36]	Explored perceptions of TBI survivors and their caregivers about long-term social integration	Qualitative study, semi-structured interviews	N= 22 TBI survivors (10 years post-trauma), N= 21 Family caregivers	Referred to the definition proposed by Reistetter and Abreu (2005)	Individuals perceived that their capacity to adjust to their physical and cognitive deficits and adapt to the living environment and available support from their loved ones were the most significant factors in achieving successful social integration.	From the perspectives of TBI survivors', social integration was an on-going process.	Not a focus of this study
2009 Yasui & Berven [20]	Provided an overview of various conceptualisations of community integration and reviewed most frequently used outcome measures of community integration	Review of the literature	NA	Reiterated the definitions formulated by McColl et al. (1998)	Divided outcome measures into four broad groups based on the community integration models: 1) Functional Independent Model; 2) Acculturation Model; 3) Normalisation Model; 4) Subjective Experience Model	Not a focus of this study	Not a focus of this study

Author	Purpose of study	Methodology/ methods	Participant information (N)	Core findings of conceptual review			
				Definition	Attributes or components	Process	Outcome
2009 Wehman et al. [42]	Examined the roles of cognitive and vocational rehabilitation and in individuals with acquired brain injury from minority backgrounds	Literature review	Studies from ABI Model Systems National Database	Not a focus of this study.	Return to productive activity is one of the most important objectives of community integration after ABI.	Not a focus of this study	Behavioural and mental health issues post ABI can impact employment and productivity outcomes.
2009 Fraas & Calvert [30]	Examined the factors leading to successful recovery and productive lifestyles after acquired brain injury (ABI)	Qualitative investigations; phenomenological approach	N= 31 ABI; average age: 43.52 (SD=13.53); 22-432 months post-injury	Not a focus of this study	Components of community integration include: 1) Social support networks 2) Grief and coping 3) Acceptance of injury and redefinition of self 4) Empowerment	Not a focus of this study	Sense of empowerment improves self-esteem and encourages individuals to contribute to the community by engaging in meaningful activities.
2010 Sander et al. [35]	Reviewed existing knowledge regarding the meaning of community integration and issues related to assessment of community integration after traumatic brain injury	Descriptive literature analysis, structured interviews	N= 167 TBI, 4-12years post injury	Community integration was referred as full participation in three major areas such as independent living, social activity, work, leisure or other productive activity.	The priority of each area of community integration may differ in individuals from different age and cultural groups.	Not a focus of this study	Not a focus of this study
2010 Wood et al. [28]	Examined patient's perspective of the process of community integration over the first year following stroke	Qualitative and longitudinal grounded theory method. N= 46 Stroke, At before discharge, and then 2,3,6 months and 1-year post discharge	N=10 Stroke (first Left hemiparetic stroke)	Community integration refers to the engagement in meaningful role, in community living. This can be attained by maintaining balance between their expectations of themselves and their physical capacity.	Patients' expectations of their integration were influenced by care and support they received from the community support networks and their interactions with peer, informal and formal caregivers.	Process of community integration includes gaining physical function, establishing independence, and getting back to real living by adjusting one's expectations.	Successful reintegration was achieved in patients who could create balance between their expectations of themselves and their capacity.

Author	Purpose of study	Methodology/ methods	Participant information (N)	Core findings of conceptual review			
				Definition	Attributes or components	Process	Outcome
2010 Dijkers [18]	Explored issues in conceptualisation and measurement of participation.	Special communication	NA	Community participation is a domain of functioning which is not just limited to disability and physical performance.	ADLs, community re-entry, societal integration, social role acquisition, community or independent living, return to normalization without restriction, psychosocial functioning & equal opportunities in various life areas such as living situation, occupation and leisure	Not a focus of this study	Participation or community integration should be measured as quantifying performance as well as subjective lived experience of an individual.
2011 Sander et al. [38]	Explored perception of community integration in ethnically diverse population	Prospective study design, mixed methods	N= 58 Blacks; N= 57 Hispanic; N= 52 whites TBI, 6 months post-injury	This study did not seek to define community integration.	Variables such as nature of surrounding environment and community, presence of family and friends, feeling respected, active involvement, being helpful to others and make positive contribution to the community was identified as facilitators to Community Integration.	Not a focus of this study	Community integration can be perceived differently if an individual belongs to the ethnic minority group, low education and low socio-economic group.
2012 Parvaneh & Cocks [14]	Developed a descriptive model of community integration framework and compared it with four existing frameworks	Delphi method	N= 37, Drawn from five stake-holder groups (practitioners, researchers, policy-makers, people with ABI and family members of people with ABI)	Integration or re-integration into the community was a vital social objective for people with ABI.	Seven themes describe construct of community integration: 1. Relationships; 2. Community Access; 3. Acceptance; 4. Occupation; 5. Being at home; 6. Picking up life again; 7. Heightened risks and vulnerability	Not a focus of this study	Not a focus of this study
2013 Obembe et al. [45]	Determined the association of community reintegration with motor function and post-stroke depression	Cross-sectional study	N= 90 Stroke survivors	Self-perceived integration is representative of individual's perception and satisfaction with involvement and in various life situations.	Not a focus of this study	Not a focus of this study	Community integration has positive association with motor function and negatively correlated with post-stroke depression.

Author	Purpose of study	Methodology/ methods	Participant information (N)	Core findings of conceptual review			
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2013 Douglas [29]	Explored an understanding of different ways adults, living with the adverse outcomes of severe TBI, conceptualise themselves	Constructivist grounded theory	N=20 Severe TBI (16 male, 4 female)	This study did not seek to define community integration.	1) Knowledge components: personal attributes (not related to injury), personal goals (domains-physical, material, social-relational, and activity); 2) Evaluative components: self-attitude and sense of achievement in above mentioned four domains; 3) Staying connected: sense of connection between self and society	Attaining self-concept post-injury is a dynamic and cyclic process in which involves transformation of personal pursuits to personal achievements that eventually influence one's sense of self.	A sense of social connection and social support are considered to be important measures of psychological recovery, community integration, family living, life satisfaction, and quality of life post severe TBI.
2013 Nalder et al. [33]	Examined the lived experiences of individuals with TBI during the first 6 months following discharge from hospital	Qualitative investigation (semi structured interviews)	N=16 TBI, 9 months post-discharge	This study did not seek to define community integration.	Not a focus of this study	The process of transition from hospital to community initiated by desire to overcome injury related life changes and regaining normal function followed by changed perspective on life. Dynamic interaction between the two was seen as individual life views.	Presence of social support network reported to be essential for successful transition.
2014 Williams et al. [12]	Examined relationship between life satisfaction, community integration, and emotional distress in individuals with TBI	Longitudinal correlational study, confirmatory factor analysis	N= 253 Adults with mild to moderate TBI	Not a focus of this study	Community integration can be categorised into two domains: 1) Objective (social participation, mobility, occupational outcomes); 2) Subjective (connectedness, social role, feeling accepted, familiar).	Not a focus of this study	Community integration is positively associated with life satisfaction but inversely related with emotional distress.



Author	Purpose of study	Methodology/ methods	Participant information (N)	Core findings of conceptual review			
				Definition	Attributes or components	Process	Outcome
2014 Fleming et al. [46]	Described environmental barriers endorsed by individuals with traumatic brain injury during the first 6 months after discharge and determine their effect on community integration.	Prospective longitudinal study with data collected at pre-discharge and at 1, 3, and 6 months post-discharge	N=135 TBI	This study did not seek to define community integration.	Not a focus of this study	Not a focus of this study	Environmental factors such as physical barriers, attitude and availability of support affect long-term physical functioning and interpersonal relationships with greater effect than policies and services.
2014 Fleming et al. [47]	Determined the rates, timing, correlates, and predictors of return to driving in the first 6 months after discharge from hospital following ABI	Prospective longitudinal cohort design	N= 212 ABI, N= 121 family members	This study did not seek to define community integration.	Return to driving is considered as a rehabilitation goal for community reintegration which represents participation in valued activities and roles as well as independent access to community locations.	Not a focus of this study	Injury severity, levels of community integration and quality of life reported to impact driving outcomes in the first 6 months post ABI. Individuals with ABI who were unable to return to driving in the first 6 months represented poor psychosocial outcomes.
2015 Gerber & Gargaro [51]	Described and evaluate a new day programme developed to provide social, recreational and skill training activities for persons living with an acquired brain injury (ABI), including persons exhibiting challenging behaviours	Interventional study, longitudinal pre-post design	N= 61 Adults with moderate-to-severe ABI; N=75 Family caregivers	This study did not seek to define community integration.	Community integration involves social interactions and participation in recreational activities.	Not a focus of this study	Limited social contact and social isolation negatively affect community integration. Training for social and leisure skills increase level of community integration and decrease caregiver burden.

Author	Purpose of study	Methodology/ methods	Participant information (N)	Core findings of conceptual review			
				Definition	Attributes or components	Process	Outcome
2015 O'Neil-Pirozzi et al. [32]	Explored the understanding of views and processes of the residential transition experience from the perspective of adults with chronic acquired brain injury and identify translatable, practical ways to support the success of such transitions	Qualitative design	N= 21 Adults with chronic TBI	This study referred to the community integration definitions proposed by Turner B. et al. (2008), and McCabe et al. (2007). Transition was associated with isolation and integration.	Not a focus of this study	The process of transition into the community includes: finding a balance between support and independence, defining a new purpose in life, transition to structure, feeling invested in the transition process, engaging in hobbies and interests and experiencing faith, fulfilment and acceptance.	Transition success is influenced by survivor factors (self-awareness, motivation), environmental factors (degree of family involvement, professional caregiver training, local resident attitudes towards individuals with disabilities), access to social (fitness) and recreational activities.
2016 Andelic et al. [17]	Assessed the trajectories of community integration in individuals with traumatic brain injury (TBI) through 1,2 and 5 years post-injury	Longitudinal cohort study at the 1,2 and 5-year follow-ups	N= 105 Individuals with moderate-to severe TBI	This study did not seek to define community integration.	Employment, leisure activities, ability to live independently and ability to drive were identified as important domains of community integration.	Not a focus of this study	Being single, employed, having higher education prior to injury, and shorter length of PTA at hospital admission were significant predictors of higher community integration at one, two, and five years post-injury.
2016 Callaway et al. [49]	Revised and updated Community Integration Questionnaire (CIQ) to include Electronic Social Networking (ESN) Domain. Examine the factor structure of the CIQ-R. Collect normative data for the CIQ-R, examining contribution of a range of independent demographic variables to community integration; and examine the test-retest reliability of the measure	A cross-sectional survey design, Community Integration Questionnaire-Revised (CIQ-R) administration	N= 1973 Australian adults; N=78 Subset analysis 3 months after original administration	This study did not seek to define community integration. It referred to the definitions given by McColl et al. (1998); Parvaneh & Cocks (2012); Willer et al. (1993).	Independence in one's own living situation, participate in meaningful activities to fill one's time, relationships with others, participate in electronic social networking activities	Not a focus of this study	Integration is associated with life stages and resources. Various demographic factors such as Gender, age, education, income, location of residence and living situation contribute to the level of community integration.

Author	Purpose of study	Methodology/ methods	Participant information (N)	Core findings of conceptual review			
				Definition	Attributes or components	Process	Outcome
2016 Soeker [37]	Explored and described the experiences of individuals with TBI regarding returning to work through the use of the model of occupational self-efficacy	Qualitative paradigm; case study	N=10 mild to moderate traumatic brain injury	This study did not seek to define community integration.	Resuming work role is essential for successful re-integration into the society. Return to work provides an individual opportunity to improve functional skills and sense of contribution.	Not a focus of this study	Not a focus of this study
2016 Ditchman et al. [49]	Investigated factors impacting social integration for adults with brain injury using the International Classification and Functioning, Disability and Health (ICF) as a conceptual model	Cross-sectional survey	N=103 Adults ABI	Social integration was described as component of participation and community integration as 'participation in social activities'.	Integration in social role, availability of social support	Not a focus of this study	Socioeconomic Status, severity of functional limitations and social support strongly impact social integration in people with brain injury.
2016 Gerber et al. [50]	Studied predictors of community integration and health-related quality of- life (HRQOL) in a sample of Canadian adult, urban, multi-ethnic persons with acquired brain injury (ABI) receiving publicly-funded community services	Cohort study	N=63 Adults who sustained ABI in last 4 years	This study did not seek to define Community integration.	Independent living, participation in social and leisure activity and involvement in work and/or other productive activity	Not a focus of this study	Level of disability was reported to impact overall community integration. Aspects of social integration were associated with quality of life post-injury.

ABI- Acquired Brain Injury, ADLs- Activities of Daily Living, TBI- Traumatic Brain Injury, CIQ- Community Integration Questionnaire, PTA- Post Traumatic Amnesia

### ***Conceptual components of community integration***

From this analysis, the conceptual components of community integration, that is, definitions, antecedents, attributes, and processes, can be identified.

#### *Defining community integration*

The analysis identified multiple definitions of community integration derived from 13 out of the 33 studies. Several studies demonstrated specific commonalities in the definition of community integration such as independent living, acquisition of social role, and vocation/avocational pursuit [8,11,15,35,43,49,52]. In contrast, other studies considered it as an adaptation process, domain of functioning which is beyond physical capacity [6,28,39,44]. It was also defined as psychological wellbeing [29], equal opportunities and acceptance in the community [40,14], and perceived satisfaction with engagement in society [45]. The range of definitions demonstrated the multidimensional nature and diversity of the conceptualisation of community integration. These findings and absence of a universally accepted definition supported the rationale for the current concept analysis. The definitions are specified in table 1.

#### *Antecedents of community integration*

Antecedents are phenomena that help clarify the key attributes of the concept and enhance understanding of the social and environmental context in which the concept takes place. There were a number of individual, injury-related, societal and environmental factors identified in the literature that are believed to influence the development of community integration. Individual demographic factors such as age, ethnicity, cultural groups, the location of residence, income, and level of education may affect the priority, perception, and outcome of each area of community integration [17,35,38,42,48,49]. Similarly, personal attributes such as self-awareness, attitude towards recovery, life roles, coping, motivation and empowerment are likely to influence integration [29,30,32,41]. Injury-related influences such as severity of the injury and the person's capacity to adjust to their physical and cognitive deficits were found to be preconditions to the level of community reintegration [36]. One study indicated the possibility of behavioural and mental health issues as a secondary consequence of ABI [34].

Societal factors included interactions with peers and family, informal and formal caregivers [28,49]. Other social indicators of being respected and being helpful to others by making a positive contribution to the community have been identified as the most significant factors in achieving successful social integration [32,36,38]. Environmental predictors of community integration were considered as the nature and structure of the surrounding environment and community. Physical barriers or facilitators such as the physical arrangement of home, work, or community, availability of transport, financial status, access to services and information, were identified to be influential on community integration [39,16,32,36,46].

## Attributes of Community Integration

According to Walker and Avant's [53] method of concept analysis, the characteristics of the concept that emerged repeatedly during the literature review were considered as attributes. Through this analysis, community integration was conceptualized as having six overarching attributes: (1) independence; (2) place to live; (3) social connection; (4) occupational performance; (5) adjustment; (6) sense of belonging. These primary areas were identified by 20 of the studies including five prominent frameworks of community integration (see figure 2) that reported conceptualisation or measurement of community integration on quantified performances or subjective lived experiences of the persons with ABI as well as healthcare professionals and family members or caregivers [18,12]. Each of these attributes is described in more detail below:

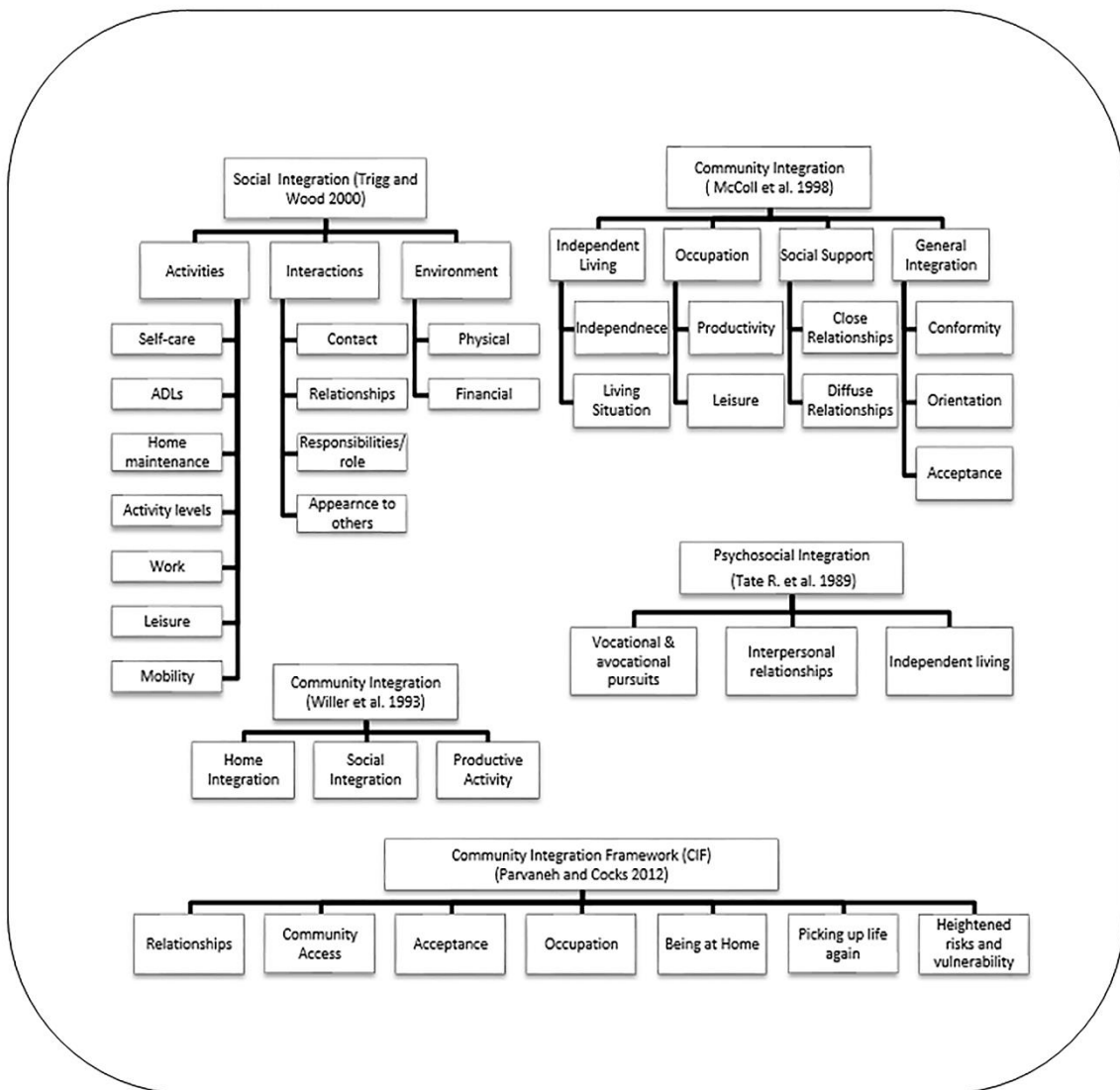


Figure 2: Five prominent frameworks of community integration.

*Independence:* Independence is the most widely explored and outcome-oriented component of community integration in the ABI population. The process of establishing independence after injury is based on improved physical function in activities of daily living [16,28]. Independence in household activities, successful access to community services and venues, mobility inside or outside the home, knowing one's way around in the community, and being able to drive, have been categorized as important aspects of community integration from the perspectives of individuals after brain injury [8,14,30,47]. Independence was also explained as being empowered in making life choices and everyday decisions, and the practice of self-determination within one's capacity [11,14].

*Place to live:* Community integration has been categorised based on having access to an appropriate, safe and normalised living environment [43,11]. This aspect of a person's living situation has been explained as 'home integration' and includes active involvement of an individual in activities in the home [8]. Similarly, the feeling of 'being at home' has been detailed as a component of the Community Integration construct, which refers to the notion of having one's own home; being able to make decisions about arrangements in the house; performing regular activities such as cooking, eating, reading, watching TV; and utilising one's own home as a base to explore and participate in community activities [14]. One study summarized that people with disabilities perceive home ownership, accessibility to community activities and services, and a feeling of being at ease at home, improved their sense of belonging in the community [38].

*Social Connection:* Social connection has been widely emphasised in conceptualizations of community integration. It has been defined as the successful acquisition of a social role [49] and adaptation of community living skills seem to have a strong correlation with life satisfaction and improved quality of life [44,50]. Social integration has been referred to as participation in a range of activities outside the home, including going out for shopping, movies, and visiting friends [8]. It has been further explained as forming and maintaining various interpersonal relationships which are significant and satisfying and that extend beyond the family, such as having a best friend or taking part in activities with members of society who do not have a disability [8,16,51]. Furthermore, social interactions with family members, friends, pets and the availability of family caregivers including the use of electronic social network have been acknowledged as facilitators of higher levels of community integration [29,30,36,48]. Another study used the term 'Social Support' as being part of the network of family, friends and other related members of the society. It was further divided into two parts: Close relationship - having a spouse or a parent in the community, and diffuse relationship - having relationships that are not characterised by closeness or intimacy [11].

*Occupational Performance:* Various broad aspects of occupational performance such as vocational or avocational activities have been recognized as indicators of successful community rehabilitation during this analysis. Being involved in some form of occupation allows ABI survivors to contribute to society through their activities such as paid or unpaid work or other productive actions [30,37,42]. Having an opportunity to participate in recreational activities helps them to express their identity and builds confidence in self, according to the perspectives of survivors of brain injury [43]. Productivity has been explained as one of the three aspects of community integration in a framework developed by Willer et al. [8] that includes employment, education and volunteer activities. McColl et al. [11] considered productive and leisure activities as sub-items of the

occupation domain of the client-centred framework of community integration. Individuals with moderate to severe TBI conceptualised financial stability and self-sufficiency as a personal achievement [29]. The underlying concept of the vocational domain was “having things to do for fun and being able to do productive activities during the main part of the day” [16]. Meaningful engagement in activities such as job, social, leisure and recreational performances at home and community settings have also been described under the Occupation theme of the Community Integration Framework (CIF) [14]. The author of the CIF added an element of choice to occupational performance that indicates the ability of the individuals to choose how to spend their time.

*Adjustment:* Adjustment can be explained as an improved cognitive and behavioural function that affects individuals’ ability to perform in the areas of vocation, emotional bonding with the other members of the family and community and contribution to the community [16]. It also involves acceptance of the injury and effectively redefining the self, allowing individuals to discover new life goals [11,30]. A sense of satisfaction experienced by the individuals in their new adjusted life situation improves their perception of community involvement and boosts their self-image [16,29,36].

*Sense of belonging:* Being actively involved in community areas improves a sense of being an important part of the community. According to the perspective of the TBI survivor, a feeling of being loved, acknowledged and supported improves their sense of stability as an inclusive but unique member of the community [29,38]. It involves the notion of being able to fit in and be accepted in the community [11]. Successful integration was also described as being satisfied, feeling empowered to make one’s own choices and having equal opportunities in various life areas [18,41].

#### *Process of Community Integration:*

Community integration is described as an ongoing process of adaptation throughout life [39]. This process often involves a transition from rehabilitation to the community as well as changes in functional recovery and adaptation to new limitations and changing life circumstances [43,28,32]. Successful transition in the community involves improved functional abilities during inpatient rehabilitation and acceptance of their changes in functional abilities and new adjusted priorities with their altered body and self-image to achieve a meaningful role in society [33,41]. Community integration was referred to as a continuous process towards regaining normality and control with a search for fulfilment and acceptance. [31,32].

The findings of this concept analysis enabled the development of a robust conceptual model of community integration. **Figure 3** is a schematic presentation of the proposed model.

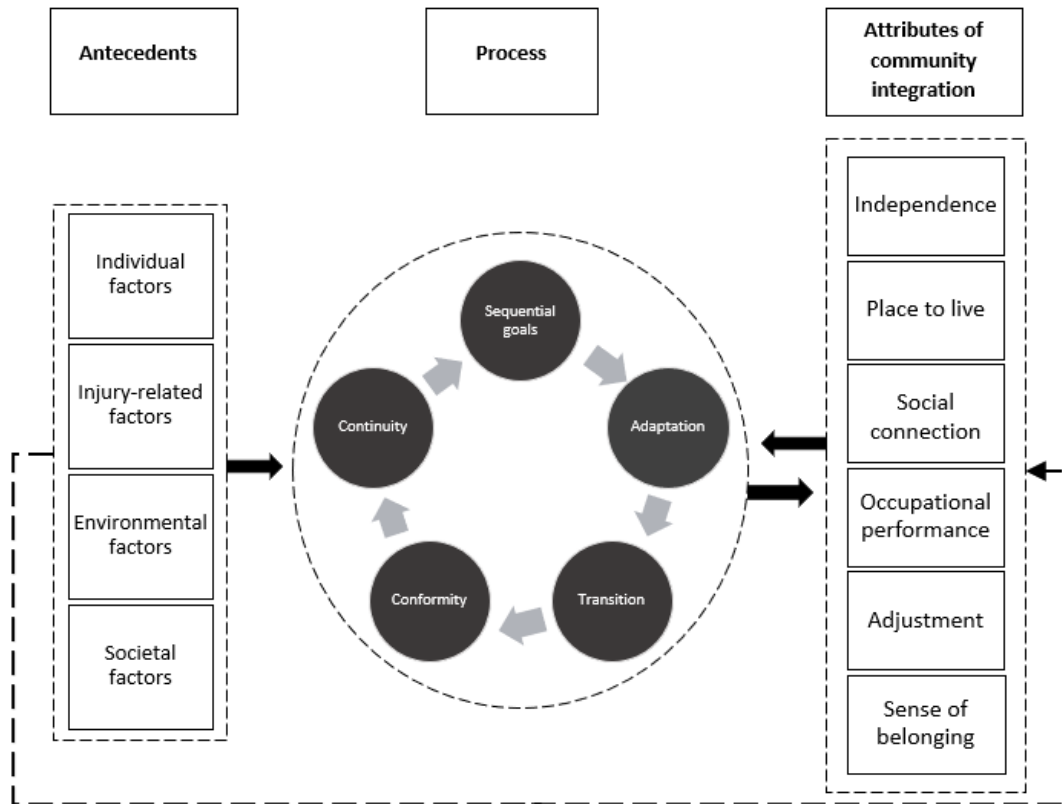


Figure 3: Conceptual model of community integration.

## DISCUSSION

This concept analysis is a unique attempt to provide a comprehensive overview of the existing knowledge about community integration through a robust synthesis of the literature. Community integration was found to be a multidimensional and non-linear process influenced by several individual, injury-related, social and environmental factors. Community integration was found to encompass six distinct but interrelated attributes including; Independence, place to live, social connection, occupational performance, adjustment, and sense of belonging.

The new conceptual model (figure 3) reflects the components of the five existing frameworks of community integration (figure 2) [8,11,14,15,16]. Five of the six components of the new conceptual model (physical integration, place to live, social integration, occupational performance, and being involved in the community) are consistent with domains of the consumer model of community integration proposed by McColl et al. [11]. According to the framework proposed by Willer et al. [8], all three domains, home integration, social integration, and productive activity, incorporated into the conceptual model of community integration are congruent with the components of our model place to live, social integration, and occupational performance respectively. A study by Obembe et al. [45] has suggested that independent living situation and functional ability could be the successful indicators of community integration, whereas others have



emphasised the importance of social support received from the community in achieving community integration goals [29,36,38,44]. Social support is considered as equally important as physical independence in our conceptual framework. Moreover, our conceptual model encompasses the attribute of 'adjustment' which was not part of any other brain injury integration framework. Additionally, previous studies have focused on the physical aspects of independence, adding to that knowledge our analysis has highlighted the importance of cognitive and psychological aspects of independence such as self-awareness, adaptation, empowerment, and decision making.

The findings of this analysis confirm the distinction made earlier between the concept of community integration and participation. This study clarifies the concept of community integration as having attributes such as sense of belonging, cognitive independence, acceptance and adjustment which are different from the participation component of the ICF [10, 11,13,14]. To explain this further, one can argue that a person with greater physical limitations could have higher integration and satisfaction if they are supported well and accepted into their new roles. This provides directions for clinicians to focus on the role of social network and empowering patients in setting their goals and availing opportunities for engaging in meaningful activities [30]. Incorporating psycho-social and vocational aspects into the interventions could help patients redefine themselves and establish independence to be able to contribute to the community.

Also, the new model presented in our findings emphasises the personal, injury related, environmental and social factors as contextual conditions that continuously influence integration which can lead to positive or negative outcomes. Environmental factors are classified under the ICF model as critical contributors for functioning and participation [54]. Apart from products and technology, natural and human-made environment, policies and attitudes as described in the ICF, personal factors discovered in our analysis such as self-awareness, coping, life roles prior to the injury, motivation and empowerment play an important part in recovery [29,32,41,46]. Understanding of such influences, not only aid in identifying potential barriers to successful community integration but also support selection of the rehabilitation setting, effective intervention design, and discharge planning.

Existing measures of community integration focus on our ability to perform activities inside and outside home, involvement in education or employment and to form or maintain relationships from individual or service evaluation perspectives [8,6,11,15,16,55]. However, none of the measures capture all the attributes highlighted in the new model, including sense of control over life situations, acceptance or sense of belonging, having accessibility and equal opportunity within the community. The conceptual model provides a basis to inform the design of community integration rehabilitation programs for people with ABI and offers a comprehensive framework for the development of measures that evaluate level of community integration as a clinical or rehabilitation outcome.

Moreover, it is evident that no universally-accepted or single definition of community integration exists, suggesting a scarcity of clear conceptual meanings of the construct. Our analysis of multiple conceptualizations of community integration indicates that the construct has not achieved maturity and fails to meet prerequisite requirements of 'being mature': "to be well-defined, have distinct attributes, well-delineated boundaries, and well-described preconditions and outcomes, as well as to be easily and readily identifiable in the clinical setting" [24,56]. This analysis contributes to advancing the understanding and maturity of the concept by providing a new and

comprehensive definition, underpinning attributes and all contextual factors in which the concept takes place.

### ***Limitations***

It is possible that not all relevant articles were included in the analysis. Whilst a number of descriptors of community integration including community re-integration, community engagement, community participation, social engagement; were used in our systematic literature search it may be the case that including other descriptors would have identified further articles. Moreover, this review was confined to the peer-reviewed articles published in English, hence more dimensions of the concept could have been explored from the potential studies in other languages. However, synthesis of the current literature and refinement of the concept in this article clarifies the concept for brain injury population. Additionally, data related to injury-severity was limited, and any differences between severities remain unclear.

### ***Recommendations for research***

The community integration concept presented here needs to be verified through further studies reporting perspectives of people with ABI, family caregivers, healthcare providers, clinicians and wider stakeholders. As children were excluded from this review, it remains unclear if the presented concept of community integration is relevant to this population. Provided the rehabilitation goals in younger population may differ from majority of adults, further explanation of interactions between functional, psychological and social limitations is required [27]. The process of transition was widely explored but there were limited data about the process of achieving community integration. It would be advantageous to conduct longitudinal studies to explore the ongoing experience of community integration in a brain injury population capturing diversity in terms of severity of injury consequences.

In this review, perspectives of adults encompassed those experiencing mild, moderate and severe injuries across studies, few studies explored the severity spectrum within the same population sample. Considering the diversity of integration process and outcomes experienced by people with varying level of severity, further research to verify the appropriateness of this model across all groups is required. This review briefly reported on components that are different across the two related concepts 'community integration' and 'participation'. It is also recommended to explore the fine distinction between these concepts. This review included studies that explored perspectives of people with ABI including TBI, stroke and other hypoxic brain injuries. It is recommended to verify this model with various injury population groups such as spinal cord injury, cancer, myocardial infarction, ABI in children, and people with psychiatric illness.

### ***Implications for rehabilitation***

Community integration is a key goal of rehabilitation [10]. Consequently, it is important to have a clear definition and understanding of this concept to ensure rehabilitation meets patients' needs. This model highlights the need for clinicians to be aware and assess of the role of antecedents as

well as the attributes of community integration itself to ensure all aspects are addressed in a manner that enhances recovery and improves the level of integration into the community. The finding that community integration is a non-linear process also highlights the need for rehabilitation professionals to review and revise plans over time in response to a person's changing circumstances and recovery journey.

Furthermore, the findings highlight the need to develop a measure of community integration that assesses all six attributes revealed in this review not recognised in previous frameworks. This analysis provides the groundwork for an operational model of community integration for the development of such an outcome measure.

## **CONCLUSION**

This study presents a concept analysis of community integration in people with ABI. It was revealed that community integration is a multifaceted non-linear process. This analysis provides a new, refined and multifaceted definition that describes community integration as 'being independent and having a sense of belonging within the community; having a place to live; being socially connected and psychologically adjusted into the community, and involved in meaningful occupational activity'. Attributes identified in previous research were supported and emphasized the role of psychological adjustment as well as independence including not only physical but also cognitive factors. The proposed conceptual model of community integration highlights the need to develop an outcome measure to assess all six components of community integration in people with ABI.

## **CONFLICT OF INTEREST**

The authors declare no conflicts of interest in regard to this paper.

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