

**Adaptation and Validation of Community
Integration Questionnaire –Revised (CIQ-R) to
Indian population**

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Register No: 16SLP028

A Dissertation Submitted in Part
Fulfillment of Degree of Master of Science
(Speech-Language Pathology) University of
Mysore
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April, 2018

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CERTIFICATE

This is to certify that this dissertation titled “**Adaptation and validation of Community Integration Questionnaire –Revised (CIQ-R) to Indian population**” is a bonafide work submitted in part fulfillment for degree of Master of Science (Speech-Language Pathology) of the student Registration Number: 16SLP028. This has been carried out under the guidance of a faculty of this institute and has not been submitted earlier to any other University for the award of any other Diploma or Degree.

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This is to certify that this dissertation entitled “Adaptation and Validation of Community Integration Questionnaire –Revised (CIQ-R) to Indian population” has been prepared under my supervision and guidance. It is also been certified that this dissertation has not been submitted earlier to any other University for the award of any other Diploma or Degree.

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Declaration

This dissertation entitled “Adaptation and validation of community integration questionnaire – Revised (CIQ-R) to Indian population” is the result of my own study under the guidance of Dr. S. P. Goswami, Professor of Speech Pathology & Head- Tele-Center for Persons with Communication Disorders, All India Institute of Speech and Hearing, Mysore, and has not been submitted earlier to any other University for the award of any other Diploma or Degree.

Mysore

April,2018

Registration No.16SLP028

ACKNOWLEDGEMENT

I would like to thank my beloved guide Dr. S.P. Goswami, for constantly guiding us and encouraging words throughout.

I would like to sincerely thank our Director, Dr S.R Savithri , for giving an opportunity to carry out this research in the institute.

Thanks to all my teachers and dear Professors who have moulded me in each step of the student life.

I would sincerely acknowledge research officers Ms. Sharon, Ms Adithi, Ms Vimala and Ms, Veena for being there with us throughout. It would be impossible to complete without you Bhavana. Thank you so much for being there with me and tolerating all my madness.

Six years of journey without you guys would be unimaginable, thank you Ammu, Ashu and Eshu for being there and giving meaning to “friendship”.

Last but not the least,our “Lunch box” team Aishu, Raksha, Rashmi, Sumanth and Ajay for making two years of AIISH life a memorable one. A big cheer to our class “Plosives” we are a wonderful batch.

Thank you so much “Sustainers “for making student life a memorable one.

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CHAPTER I

INTRODUCTION

“Community integration is much more than just being there”

(Jackson, 1997)

Language is directly associated with our ability to communicate and fulfill our accustomed roles in society such as roles as a friend, parent, sibling, employee, employer, and so forth. Aphasia directly affects individual's ability to use language resulting in a change to their life participation. Hence, it can alter the social participation of person with aphasia (PWA) and their role performance in their day to day life situations. Aphasia is considered to be a life-changing event because of its impact on communication abilities. People are confronted with a loss of language, isolating them from their social world, often without the ability to understand the environment and without the ability to express their own thoughts, feelings, and questions about what is happening to them.

The major emphasis in the literature is towards linguistic ability and associated aspects of persons with aphasia. However, in real life situation various other issues also play a vital role. For persons with aphasia and their family members participation across various situations is more important than knowing names of few lexical categories or repetition etc (Le Dorze & Brassard, 1995). Following are few aspects which are noteworthy and needs to be kept in mind while working with persons with aphasia.

Accomplishment of several activities of daily living for instance, bathing, eating, cleaning, shopping, travelling, watching TV, listening to music, reading newspaper, writing letters, using computers, calculation, managing finance are more imperative for persons with aphasia. Meanwhile, most of these activities also involve some or the other aspect of communication. Aphasia also affects domestic life of person with aphasia (Hilari & Byng, 2009).

Interpersonal interactions and social life include relationship with family members, relatives, friends, participating in various social events like festivals, religious activities, parties etc. Interpersonal interactions and relations are reported to be altered in persons with aphasia (Jackson, 1997)

Work integration or returning to work place is a very essential issue in the life of persons with aphasia. Stroke hampers ability of an individual to return back to work (Hirsh, Braden, Craggs, & Jensen, 2011; Le Dorze & Brassard, 1995). There are more chances of change of job or reduction in timing etc. This can severely affect life of person with aphasia. This reduces their confidence and can lead to depression (Hamilton, Chrysikoua, & Coslett, 2011; Piškur et al., 2014).

The concept community integration can be considered equivalent to, or even identical with, the concept 'participation' in the ICF (Hamilton et al., 2011; Piškur et al., 2014). The ICF defines 'participation' as the taking part in life situations (Chang, Coster, & Helfrich, 2013). Taking part can be described as involvement, engaging in, being part of or being included in life situations, as well as having access to necessary resources (Chang et al., 2013). "Community integration has consistently been considered by many researchers as the ultimate goal of rehabilitation after traumatic brain injury" (Lim et al., 2013).

Need For the Study:

Despite decreased QOL in PWA, the extent of impairment with respect to community integration is not much researched area in the field of speech language pathology. Community integration is one of the important emerging aspects in the field of rehabilitation services to accurately measure the outcome of therapeutic services. In Indian scenario most of our assessment protocol stop at the level of linguistic analysis .It is important for us to look into the effect of aphasia on the quality of life and community integration. However, studies on evaluation of community integration of PWA specifically to Indian languages are less. Hence, there is a need to develop a protocol to measure the extent of impairment in the community integration specifically in PWA.

Aim

- The aim of the present study is to adapt CIQ-R in Indian context
- To validate the CIQ-R to Indian population in Karnataka region.

CHAPTER II

REVIEW OF LITERATURE

2.1 Introduction

Development of social participation approaches to the field of aphasiology has given a new insight to the assessment and treatment methods for PWA. Initially the concept of handicap was included within the framework of International Classification of Impairment, Disabilities and Handicaps (ICIDH), given by World Health Organization (Piškur et al., 2014). Emergence of normalization movement paved way to replace Handicap with participation in 1960s. Re-integration of PWA to the community and social life is an important aspect in the rehabilitation. However, the instruments to measure the social participation in person with aphasia are less. This chapter gives insight on the concept of 'Disability and its effect on PWA', 'concept of community integration and its measures.

2.2 Disability

Disability is limitation in activity and functioning that are required for daily living. Reduction of this limitation is considered as the ultimate goal of rehabilitation. Rehabilitation professionals and researchers rely on conceptual frameworks of disability to provide a common language and help guide clinical care as well as disability research (Kratz, Chadd, Jensen, Kehn, & Kroll, 2015). Until the 1980s, individual approaches to disability predominantly guided management of persons with disabilities. In the past three decades the perspective of disability has shifted towards a more societal and human rights approach (Elman, Ph, Convention, & Washington, 2000)

2.3 Aphasia leading to Disability

Aphasia directly affects individuals' ability to use language. Language difficulties impact directly an individual's quality of life in the areas of independence, social interaction, vocational effectiveness, and leisure activities. People with aphasia in the age between 20 and 65 years face an enormous challenge to regain a meaningful level of participation in society, to fulfill their roles as parent, partner, colleague or club member (Nedeltchev et al., 2005). When referring to PWA, disability is often described in terms of barriers like physical, social and /or psychological. Hence, aphasia causes disability in a person with regard to the limitation it causes to the person's day to day activities. Removing these barriers is important in empowering individuals with Aphasia (Chapey et al., 2001). The challenge of living with aphasia is very different for a younger patient compared to elderly patient. Hence, the amount of disability due to aphasia is different in different age groups.

Aphasia assessment often stops at the level of linguistic assessment. Very little attention has been paid to the evaluation of long-term prognosis, functional outcome and aspects of participation that specifically concern young patients (Mouille-brachet, Couderq, & Gil, 1998). When WHO introduced concept of participation in the framework of ICF, it gained its importance in the field of rehabilitation.

Various theories and models are quoted in literature in the field of rehabilitation to explain the concept of disability and its effects on the individuals. Person-environment fit theories are in line with models of disability including the World Health Organization's International Classification of Functioning, Disability and Health which utilizes a bio- psychosocial model (WHO-ICF, 2007). This model takes into consideration the interaction

between the individual and the environment. The WHO-ICF model looks at the individual not only from a biological standpoint but also from a psychological and social viewpoint. The model considers the person as a whole including how their impairments may affect their lives in a variety of contexts. By utilizing the WHO-ICF model of disability, rehabilitation that focuses on aiding an individual to improve communication will likely also improve physical, social, and psychological well-being. This model allows for patients to have more involvement with decisions and direction of their course of rehabilitation treatment rather than relying on the rehabilitation specialist or caregivers alone.

2.4 Approaches to Disability:

Various individual approaches to disability are medical model, personal tragedy model and individual pathology model (Centeno & Kohnert, 2008; Hirsh et al., 2011). According to Jette (2006) individual approaches find and locate disability in the person and see it as it is. Characteristic of the person, is directly caused by disease, trauma or other health conditions and requires some type of intervention given by professionals to ‘correct’ or ‘compensate’ for the problem” It is characterized by the identification and measurement of bodily deficits to allow health care professionals to reach specific medical diagnoses (Welage & Liu, 2008).The physical, cognitive, psychological and/or emotional impairment is seen as the cause of the person’s functional limitations and limited participation (R. Dalemans, de Witte, Lemmens, van den Heuvel, & Wade, 2008)

Individual approaches may lead exclusion of person with disability from their community and social participation or society as a whole. This is because the persons with disability are viewed as being outside the normalcy (specific norms of the society), having a deficit leads to

disability in all their normal day to day living which in turn requires special care and attention from the family members. This makes them isolated from the community in which they live.

2.5 Societal or human rights approaches to disability.

In contradiction to individual approaches, societal approaches see person with disability as socially created phenomena. These approaches include models such as the social barriers model and the social oppression model. According to social approaches the deficit associated with disability is identified within societal attitudes and unaccommodating social, physical and political environments and not within the physical, psychological or cognitive impairments of the individual (Jackson, 1997). This approach gives an opportunity to reorganize and re-build society, to allow person with disability to participate and contribute to the society with equal rights.

As social approaches to disability call for the removal of social barriers, they facilitate inclusive practices within society to enable persons with disabilities to be fully integrated into community life (Jordan & Bryan 2001). Some of the examples are- employee return back to workplace, mainstreaming for children with disability etc. This helps them to become independent, visible and active members of their community.

Critics of the social approach point out that it does not incorporate the individual's physical body; the experiences and the history of the individual. This may lead to inattention to personal functional goals and medical and rehabilitation needs which may negatively affect the functional independence and community integration of persons with disabilities (Elman et al., 2000; Reistetter & Abreu, 2005).

2.6 Bio-psychosocial approaches to disability:

This approach combines both individual and social approaches considering the roles of biological, personal and social factors in the creation of disability (Sherratt & Hersh, 2010). It has been widely adopted by health care professionals in the field of disability. One best example, which is based on bio-psychological approach is International Classification of Functioning, Disability and Health (ICF) (WHO 2001). The interaction between individual, his/her health status and their roles and responsibility in the society, and various other contextual factors are the framework of the ICF. It distinguishes between three domains of human functioning: body structures and functions, activities and participation. Illness or limitations in these three domains can lead to impairments, activity limitations and participation restrictions. Utilizing the above mentioned factors ICF describes about, the limitation to carry out certain tasks involved in life situations that occur as a consequence of the disease/trauma. The gap or difference a person experiences between the level of performance of an activity and the level of participation in life situations is then mostly attributed to the influence and impact of contextual factors (Levasseur, Desrosiers, & St-Cyr Tribble, 2008)

Bio-psychosocial approach and the ICF is used as disability framework and has been extensively used in the field of aphasiology. Since, it recognizes both the individual and societal or contextual factors contributing to the disability experience, this approach should have the biggest positive impact on an individual's community integration.

2.7 Concept of community integration (CI)

Community integration is a broad, multidimensional concept. This multidimensional nature of CI poses a difficulty in defining it adequately. Many definitions of CI are available within the literature. Definitions are outlined below in Table 1.

Table 1: Definitions for community integration

Author	Definition of CI
(Jackson, 1997)	Community integration means having something to do; some-where to live; and someone to love'
(Willer et al 1993)	Community integration is divided into three related categories: (1) Integration into a homelike setting (2) Social integration (3) Integration into productive activities
(McCull et al 1998)	CI model consists of Four-dimensions: (1) General integration (2) Independent living (3) Occupation (4) Social support
(Dijkers, 1997)	Community integration is nothing but priorities and opportunities for people in the least restrictive environments.
(McCull et al 2001)	CI is the experience of being a part of the community, being accepted, and not being unduly disadvantaged because of the disability This definition is threefold: 1) Activities to fill one's time, 2) Independence in one's living situation 3) Relationships with other people
(Reistetter & Abreu, 2005)	CI is a broad, multi-dimensional concept but is not limited to; 1) Helping individuals with gaining independence in living 2) Obtaining a residence 3) Maintaining a social support network 4) Engaging in productive activity
(Lim et al., 2013)	CI is defined as 1) Settling clients into communities where they can be happy and productive 2) Providing opportunities for people in the least restricted environment.

Literature gives many dimensions and notions about the concept of community integration. It is often described in terms such as 'mainstreaming', 'inclusion in everyday life' 're-integration' etc. A definition given by Dijkers (1998) highlights the fact that community

integration is a multifaceted phenomenon, which is influenced by many factors such as age, gender, and their cultural background. Each individual is unique and will be contributing to their community by participating in various day to day activities: in turn, contributing to the goals of their community in their own way.

After acquiring a disability, the person should be re-integrated .This involves resumption of their roles and relationships that the individual played prior to being injured or impaired.

According to McColl (2003) there are three themes common to all of the above definitions.

CI involves;

- 1) Relationships with others
- 2) An independent living situation
- 3) The need to have activities to occupy one's time.

Thus community integration includes elements of being part of, participating in and sharing responsibilities of family and community life; building and growing relationships with family, friends and community members; and being involved in meaningful activities as a contributing member of society as considered normal for someone of a specific age, gender and culture (Dijkers, 1997; Eadie et al., 2006; Lim et al., 2013; McDermott & Turk, 2011; Salter, McClure, Foley, & Teasell, 2011)

Literature suggests that community integration is in line with the “Participation” in the ICF (Lim et al., 2013; McDermott & Turk, 2011), which is often considered in the treatment approaches to PWA. The ICF defines participation as the performance of people in actual activities in social life domains through interaction with others in the context in which they live. Mothabeng, Eksteen & Westaway (2012) opined that even though community reintegration is

the most meaningful outcome of rehabilitation services, it is one of the major challenges that persons with disability face.

2.7.1 Disability and Community integration

Many authors clearly define the importance of community integration as the ultimate goal of rehabilitation services. Community participation has been regarded as a key indicator of successful rehabilitation for people with disabilities” (Chang et al., 2013). The person’s focus and goal often shifts towards attaining the former roles and responsibilities in life once, the survival is certain (Salter et al., 2011). This is because acquiring a disability is a life changing event. This means that a disabled individual often strives for “what really counts and matters in life” (Dijkers, 1997). Disability limits the person in acquiring the former roles and responsibilities and also to be an active member in their community life. Yet, they have an inherent right to participate and should be given an opportunity to live, work, recreate with the same spirit as that of their cognitively healthy peers. Working towards this goal, helping them achieve is the same is the sole responsibility of people working in the rehabilitation field be it a speech language pathologist and/or occupation therapist etc.

Wood-Dauphinee, Côté, Durcan and Carlton (2002) showed that active participation in community activities and life roles leads to higher quality of life and life satisfaction amongst persons with disabilities. Community integration outcome measure helps us to measure the levels of integration of the person.

2.8 Outcome measures

A number of valid and reliable tools/instruments have been developed to determine and measure community integration of persons with disabilities (R. J. P. Dalemans, De Witte, Wade, & Van Den Heuvel, 2010; Lim et al., 2013; Yasui & Berven, 2009). These tools are referred to

as community integration outcome measures. Measurement can be of two types depending upon the objectives. They include subjective measures and objective measures. Outcome measures that assess from the perspective of the person who has difficulty in the tasks of integrating with his or her community are referred to as subjective in nature. They can be self report forms or tools. Measures that assess community integration from the perspective of a service provider are referred to as objective community integration outcome measures.

2.9 Objective outcome measures

These measures quantify the participation in life role activities in terms of their total Frequency of participation, Time spent in engaging of certain activities, support needed in carrying out those activities and variety of activities carried out.(Chang et al., 2013; Yasui & Berven, 2009).Activities assessed using this objective measures will generally fall under physical and social components of CI. They mainly focus on the domestic activities, involvement in productive activities and social interactions with others (Centeno & Kohnert, 2008). Most widely used instruments /tools under this category ,as identified by Salter et al (2008) are as follows:

- Community integration Questionnaire (CIQ)
- Craig Handicap Assessment and Reporting Technique (CHART)
- Participation Index of the Mayo-Portland Adaptability Inventory-4

Objective measures describe community integration according to an individual's level of functional independence and participation (Mouille-brachet et al., 1998).Objective measures assume that higher frequency (more) and less support (high Independence) are better. Individual and cultural differences are not taken into consideration (Chang et al., 2013; Horn, Waade, & Kalisky, 2016), marking the limitation of objective measures.

2.9 Subjective outcome measures

Subjective measures mainly focus on self perception of the problem, their feelings and internal experiences. Chang et al. (2013); Salter et al. (2008), reports that subjective outcome measures typically access the following:

- Sense of belonging
- Satisfaction with involvement in community activities
- Attitudes, perceptions, experiences
- Beliefs

They access participation within the social relationships, independent living, occupation and general integration domains (McDermott & Turk, 2011). Widely and frequently used subjective outcome measures as identified by Sander et al. (2010) and Yasui & Berven (2009) include;

- The Reintegration to Normal Living Index (RNLI)
- The Community Integration Measure
- The Sydney Psychosocial Reintegration Scale

Among various objective and subjective measures, The Community Integration Questionnaire has driven lot of attention from many researchers across the world due to its high validity and reliability, irrespective of the population in which it is used.

2.9 Community Integration Questionnaire (CIQ)

Community Integration Questionnaire was given by Willer and Barrey (1994). They defined it to be as “effective role performance of an individual in community setting”. CIQ is an important instrument and it is one of the instruments used worldwide to measure the amount of

handicap. The amount of perceived disability, depends on the interaction between the disabled person and the surrounding environment (Salter et al., 2011).

CIQ is a brief and a reliable measure of community integration. It can be administered on a person with TBI directly, either face to face or can be done by a proxy. CIQ is reported to be measuring various behaviors as opposed to feelings, and it is found to be sensitive to various living situations. CIQ was originally designed for program evaluation to assess a person's control over their home environment, integration into their social support network and meaningful and productive use of their daytime activities, together with health, functional and financial circumstances. To achieve higher levels of reliability, the CIQ uses behavioral indicators of integration and does not include items focused on feelings or emotional status (Dijkers, 1997). The scale is comprised of 15 items in three corresponding subscales each of which has a different number of items and sub-scores (Reistetter & Abreu, 2005). The home integration subscale consists of six items each scored on a scale from 0-2, where 0 represents the lowest degree of integration. The social integration subscale includes five items which are rated in the same manner as of home integration. The productivity subscale consists of four questions with responses weighted to provide a total of seven points. Scores from each of the subscales are summed to provide an overall CIQ score. The maximum possible score is 29, which reflects complete community integration (Eadie et al., 2006). Highest score is believed to provide higher integration of the person

The CIQ has become one of the most frequently used instruments internationally to measure community integration in terms of home, social and productivity across various disordered population. It is tabulated in the table.

Table 2: List of studies done on various disorders using CIQ

Studies	Authors
Studied Community integration in brain injury individuals.	(Elman et al., 2000; Kaplan, 2001; Wade, Hewer, David, & Enderby, 1986)
For individuals with spinal cord injury Other physical disabilities.	(Hirsh et al., 2011; Kratz et al., 2015)
Individuals with Aphasia.	(R. J. P. Dalemans, De Witte, Wade, & Van den Heuvel, 2008)
Individuals with brain tumors.	(Kaplan, 2001)

In Australia, the CIQ is a approved measure of community integration used in allied health outcome measures reporting to government bodies (Winkler et al., 2012).The CIQ is now used by the Transport Accident Commission (TAC) in Victoria, Australia, as a key measure of outcome for neuro-trauma clients (TAC, 2014).

Studies using CIQ

Willer et al. (1994) reports about the psychometric properties of CIQ .The test – retest reliability coefficient for total CIQ scores over an average of 10-day interval was reported to be 0.91 for individuals themselves and 0.97 for family members’ assessment of individuals. Reliability coefficients for subscales were between 0.83 and 0.93 for individuals with disability and 0.90 and 0.97 for their families. In addition, positive relationship were found between individual and family member ratings, with correlations of 0.81 for home integration subscale, 0.74 for social integration and 0.96 for productive activity.

Hirsh et al (2011) studied psychometric properties of the CIQ in adults with physical disability. Study included adults with spinal cord injury (n=146), multiple sclerosis (n=174), limb loss (n=158), or muscular dystrophy (n=273).The results showed that CIQ is a valid and reliable tool to measure the participation in these population.

In Indian context Urvashi Singh and Vidushi Sharma (2011) studied the validity and reliability of community integration questionnaire in elderly. They administered it on to 30 subjects who were recruited from community as well as old-age homes to determine internal consistency and test-retest. The obtained scale was renamed as CIQ-GI for Indian population. The results showed that it is a valid and reliable tool to measure participation in elderly.

CIQ in Aphasic population

A systematic review by Dalemans (2009), conducted to identify and explain measures of community integration in persons with aphasia. There was much difference in the social participation of people with aphasia (range total CIQ score: 4-25). The mean score on the CIQ was 14.2 (SD =4.9), with the social integration subscale score contributing the most to the total CIQ score. Scores were lower in home integration and in productivity subscale. Age, gender, functional activities of daily living (ADL) performance and aphasia severity were related to social participation (adjusted $R^2=.37$). There were four variables that contributed significantly to the model: functional performance, age, gender and severity of aphasia. Those who were younger and those who were female were found to have a higher level of integration. The other main factors were functional performance (people with better functional ADL performance participated more and the severity of aphasia, which added a significant contribution

The review found that the Community Integration Questionnaire (CIQ) is possibly suitable for use in people with aphasia. It is particularly suitable because it uses a consistent response set throughout the administration and the instrument ensures a careful ordering of items. It uses short, comprehensible statements, active verbs in the items, and positive language.

Metaphors and abbreviations are avoided. All these aspects are important facilitators for use in people with aphasia; however, data regarding its performance in people with aphasia are absent.

Variables affecting Community integration

Anything that restricts the person to work independently, affects his overall interaction with the community. CIQ gives a set of questions with the preferred answer set and allows the person to choose from the set. That is, myself alone and /or myself alone with someone else. Hence, there are many perplexing variables that may affect the person's reactions and the way he or she reaches the environment. This variation is observed not only with neurological insults individual but even in neuro-typical individuals also.

It can be either personal factors (age, gender, education of the person) and/ or environmental factors (occupation, culture, community, belief of the community etc). All these factors affect the community integration of the person. Dijkers (1997) reports that age, gender and level of education all have a major effect on integration scores on CIQ. Dijkers (1997) reviewed four studies who reported the effects of age and, it appeared that, scores for females indicated higher integration into the home, while male scores suggested more integration in the productivity subscale. Kaplan (2001) established similar effects of gender in home integration in a sample of neuro-typical individuals and those with malignant brain tumors. It has been recommended that a lack of more traditional, male household tasks may have contributed for some of the difference in home integration scores (Dijkers 1997).

In the 1997 review, Dijkers report a inclination of younger age to be associated with higher integration on the CIQ. Kaplan (2001) reported that older age was significantly related to

lower community integration both for the total CIQ and for all the subscales. In addition to age and gender, amount of education appeared to have an effect on community integration as assessed by the CIQ. More education is associated with better integration in all three dimensions (Heinemann & Whiteneck 1995; Kaplan 2001). Gender roles, age and education differences all impact the CIQ in one or the other way in the individual. These differences need to be addressed in the scale by the developing age-appropriate norms stratified by education, gender and marital status (Dijkers 1997; Kaplan 2001; Sander et al. 1999).

A social role theory given by Margaret Mead and Talcott Parsons (1920) in sociology and social psychology field gives explanations about the variables that affects the overall integration of an individual in the community (Eagly & Wood, 2012).

Revision of CIQ to CIQ-R

Advancement in technology has been a boon to many of the individuals who are able to access to them. It has certainly impacted everyone in both positive and negative way. Winkler and Barry Willer (2014) updated CIQ with the addition of three questions related to use of technology called as Electronic social networking (ESN).

CIQ-R currently has 18 questions in total with four subsets. They are as follows:

- Home integration subscale
- Social integration subscale
- Productivity
- Electronic social networking

The scoring method for the CIQ-R was revised. Scores for item six are now included along with home integration subscale instead of the social integration. Three new items that reflect electronic social networking were added to the scale, forming the new ESN subscale. The total CIQ-R score now comprises the sum of all four subscales. Potential score can range from 0-35.

Australian normative data for CIQ-R

Australian normative data has been developed for CIQ-R by Winkler et al (2014). A sample of 2000 Australian adults of working age participated in the study. The variables considered were gender, age, metro/regional residence and state/territory those that reflect the demographics of the major Australian population. The CIQ-R was then validated on 20 people with TBI.

The CIQ-R normative data indicated that there were significant demographic predictors to various CIQ-R subscales and the total CIQ-R score. Gender, age, education, income, location of residence and living situation all made various contributions to the level of community integration in the neuro-typical individuals in Australian population. The results showed that, among neuro- typical, home integration is found to be 7.69 and for social integration 6.70. When productivity is considered, mean score was 4.73 irrespective of the age. For ESN subscale, mean score was 3.21. Over all integration is observed to be 22.33 out of 35 total score.

Although the life participation approach allows clinicians and researchers to focus on the real-life goals of people affected by aphasia, there is little evidence about the way in which people with aphasia participate in life. Perhaps even less is known about the younger age group, confronted with different problems from elder individuals with aphasia. Information about the participation of this younger age group is necessary in order to adjust care to their specific needs

and facilitate their chances for social and occupational reintegration. Hence, as a preliminary stage, the validation of CIQ-R to Indian population is done in this study.

CHAPTER III

METHOD

The aim of the present study was to adapt the Revised Community Integration Questionnaire (CIQ-R) and to validate it to Indian population in Karnataka region. Also, it is aimed to check the level of integration in neuro- typical individuals and in individuals with neurological insults.

3.1 Following are the operational definitions for the terms used in the present study:

Community: Group of people living in one area who have similar interests and attitude in common.

Integration: To join together as a group. In other, words to merge/ assimilate together in a group.

Questionnaire: A set of questions given with a set of choices or options. They are designed to test a particular area of interest of the researcher.

Neuro-typical group: This group refers to individuals who do not display any neurologically atypical patterns or damage to their brain, for example, Computed Tomography scan reveals normal structure, Magnetic Resonant Imaging reports normal brain imaging.

Lexical deficit: Difficulty in processing of words, in reading, writing i.e. in comprehension and expression as a whole.

Psychological issue: Behavioral problems that impact multiple domains of life.

Post stroke onset: This refers to the duration that has passed since the episode of stroke.

The study included six phases:

1. Consent from the authors
2. Adaptation of CIQ-R
3. Validation of the questionnaire
4. Administration of the questionnaire
5. Examining the test –retest reliability of the questionnaire
6. Statistical analysis of the data

Phase 1: Consent from the Authors

Before the adaptation of the questionnaire, the consent from the authors of the community integration questionnaire (CIQ-R) was taken.

Phase 2 : Adaptation of CIQ-R to Indian Population

Revised community integration questionnaire (CIQ-R) contains 18 questions broadly divided into four domains. They are:

- a) **Home integration:** Active participation in home or household activities. The questions focus on child care, meal preparation, shopping for groceries etc.
- b) **Social integration:** It is the ability to participate in activities outside the home environment. Questions encompass from paying bills to frequency of leisure activities and social relationships.
- c) **Productivity:** It is the ability to contribute positively to the community and society in large. This assesses person's volunteering activities, frequency of travel outside home, ongoing formal education and employment.
- d) **Electronic social networking:** It is the ability to use technology enabled interactions.

Adaptation comprises of reviewing, revising and appropriately adapting community integration Questionnaire- R (CIQ-R) to Indian context.

Step 1: Add or Remove the questions that are (is) not relevant to Indian context.

The questions that were not culturally and socially accepted was removed and substituted by more socially relevant questions by three experienced speech language pathologists with minimum of eight years of experience in the clinical research in the field of speech language pathology.

For the purpose of this study, the response choice for question number 10 of the original CIQ-R was modified to ensure that they were appropriate for the normative population. Question number 10 in the original CIQ was “*When you participate in leisure activities do you usually do this alone or with others?*” The original response choice of *Mostly with friends who have head injuries* was omitted and the option “*Mostly with friends who do not have head injuries*” was modified to “*Mostly with friends*”. All the other questions were retained in the questionnaire.

Phase 3: Validation of the Questionnaire

For the Validation of the tool, a feedback questionnaire (Goswami, Shanbal, Samasmitha and Navitha,2012) containing 20 parameters like simplicity, familiarity, relevance, and generalization etc is utilized. Ten SLPs were given with the CIQ-R for validation, to rate the questions using the feedback questionnaire. The items in the questionnaire were modified based on the suggestions provided by the SLPs.

Ratings of judges, using “Feedback questionnaire for aphasia management manual are tabulated in Table 3

Table 3: Results of validation of the questionnaire

Sl.No.	Parameters	Very poor	poor	Fair	Good	Excellent
1.	Simplicity				2	8
2.	Presentation				3	7
3.	Relevancy				1	9
4.	Complexity			3	7	
5.	Accessible				8	2
6.	Flexibility					10
7.	Trainability				3	7
8.	Stimulability				1	9
9.	Feasibility				4	6
10.	Generalization				2	8
11.	Scope of practice				2	8
12.	Scoring Pattern					10
13.	Coverage of parameters				3	7

Few parameters from the feedback questionnaire were removed as they were not relevant for the current study. Such as, size of the picture, color and appearance, arrangement and iconicity.

Phase 4: Administration of the Questionnaire

Data collection includes following steps:

Step 1: Recruitment of the individuals

A representative sample of one hundred individuals between the age ranges of 20 to 70 years, were collected individually. The criteria for participants in neuro-typical group are as shown in the table.

Table 4: Criteria for the participants in neuro-typical group

Subgroup	Age range	Total number of participants
Group I	>20 to ≤30	20
Group II	>30 to ≤40	20
Group III	>40 to ≤50	20
Group IV	>50 to ≤60	20
Group V	>60 to ≤70	20

One more group was made (Group VI) wherein ten individuals with aphasia were added to validate the tool. It was administered on 10 individuals diagnosed with Aphasia by using Western Aphasia battery-Kannada (WAB-K, Shyamala and Vijayashree, 2007) by a trained speech language pathologist. The age range of persons with aphasia was between 20-70 years.

Table 5: Criteria for PWA

Subgroup	Age range	Total number of participants
Group VI	>25 to ≤75	10

Various type of aphasia was represented (Three Broca's aphasia, two conduction aphasia, two anomic, one Wernicke's aphasia, and one global aphasia). Table-6 includes details of demographic data which include age, type of aphasia, education and languages known to persons with aphasia.

Table -6: Demographic details of aphasic participants

Sl.No	Type of Aphasia	Age/ Gender	Languages known	Cause of the problem	AQ score	Education
1.	Conduction aphasia	27y/F	Kannada, English	Stroke	39.4	Graduate
2.	Broca's aphasia	40y/F	Kannada	Stroke	55.4	Graduate
3.	Conduction aphasia	32y/F	Kannada, English	Stroke	40.2	Secondary education
4.	Anomic aphasia	45y/M	Kannada, English, Hindi	Stroke	73.4	Post graduate
5.	Broca's aphasia	20y/M	Kannada	Viral infection	55.6	Secondary education
6.	Global aphasia	55y/M	Kannada	Stroke	6.6	Uneducated
7.	Broca's aphasia	62y/M	Kannada, English, Hindi	Stroke	59.4	Postgraduate
8.	Wernicke's aphasia	56y/M	Kannada	Stroke	18.6	Graduate
9.	Anomic aphasia	34y/M	Kannada, English	Post fever	86.4	Secondary education
10.	Broca's aphasia	47y/M	Kannada	Stroke.	50.4	Graduate

Ethical standards used in the study for the selection of participants

Participants were selected by adhering to the appropriate ethical procedures. Participants and caregivers were explained the aim and procedures of the study, and an informal verbal and/

or written consent were obtained. Participants were randomly selected based on the inclusionary criteria.

Inclusion criteria for Neuro- typical individuals:

Participants should not have any obvious linguistic deficit, psychological issues, cognitive deficit, physical or motor deficit, sensory deficit. Participants with the history of any of the above mentioned problems were removed from the study at this stage itself.

Inclusion criteria for individuals with aphasia:

- Aphasia following stroke or any other left hemisphere damage.
- No known history of pre-morbid neurological illness, psychiatric disorders and/or cognitive decline, and no other significant sensory and/or cognitive deficits that could interfere with the individual's performance in the investigation.

Step2: Procedure for Administering CIQ-R

Participants were randomly selected .They were explained the aim and procedures of the study, and an informal verbal and/ or written consent was obtained (Appendix I).They were made to sit comfortably on chair opposite to the investigator and were administered in a noise free environment.

All the participants were provided with the questionnaire and were asked to answer all the questions. Administration of the instrument was either self-rating or interview based. Responses were either verbal response or graphic response. Verbal response included participants responding verbally for questions asked by the investigator through interview method. Graphic response includes participants writing their response in the questionnaire. Total time was about ten to fifteen minutes.

Step3: Scoring the responses.

CIQ-R includes a total of 18 questions which are divided into four major domains in the 3 point rating scale higher score (score of 2) indicated that there is higher/ good integration (Appendix II). Lower score indicates minimum integration. The scores are divided further depending on the subscales. It corresponds to home integration (sum of scores from questions 1 to 6), social integration (sum of scores of questions 7 to 11), productivity (sum of scores from 12 to 15, including job scale variable i.e., questions related to current education and working conditions.), ESN (sum of scores from 16 to 18). Total CIQ-R Score = Sum of home integration, social integration, productivity, and ESN scores.

Table 7: Example of the scoring pattern:

Question: In your home who usually does the normal everyday housework?	
Answer	Score
Yourself alone	2
Yourself and someone else	1
Someone else	0

Phase 5 -Examining the Test –Retest Reliability of the Questionnaire

10% of the collected sample was re-tested by another SLP to establish reliability of response scoring.

Phase 6-Analysis of the data

The raw scores were tabulated for the statistical analysis. Using SPSS software, the tabulated raw scores were analyzed. Mean (X), median (M) and standard deviation (SD) were used as statistical measures to arrive at normative scores for each domain.

To see the difference between the groups, Kruskal Wallis test and Mann Whitney U test is carried out. Further, aphasia group was also compared with respect to the type of aphasia and other factors using Kruskal- Wallis group comparison and Mann Whitney test.

CHAPTER IV

RESULTS AND DISCUSSION

The CIQ was developed and designed to be administered on persons with TBI in a face to face interview or a telephonic interview. The main purpose was to assess the person's control over their home environment, integration into their social support network and meaningful and productive use of their daytime activities, together with health, functional and financial circumstances. The questionnaire is modified as CIQ-R by adding another dimension referred as electronic social networking.

Thus, the present study aimed at adapting and validating community integration questionnaire to Indian population in Karnataka region. Also, it was aimed to check the level of integration in neuro-typical individuals and in individuals with neurological insults. For the validation of the tool, a feedback questionnaire (Goswami, Shanbal, Samasmitha&Navitha,2012) containing 20 parameters like simplicity, familiarity, relevance, and generalization etc. was utilized. Ten speech language pathologists (SLPs) were given with the CIQ-R for validation, to rate the questions using the feedback questionnaire.

A detailed rating on the questionnaire given by ten SLPs is presented below:

Parameters concerned with the stimuli of the test (like Simplicity, Provability, and Relevancy).SLPs mostly rated these parameters in 'excellent' and 'good'. This indicated that the questionnaire has maintained commonality and has good relevance to the cultural dimensions of the population that it is intended to assess.

Parameters related to test make up (like complexity, flexibility, stimulability) on these parameters most of the SLPs rated 'Excellent' and 'Good', indicating that test is good enough to

sever its purpose in assessing the integration in the population and is still viable to be considered for rephrasing in terms of complexity.

Parameters concerned with output of the test (like scoring pattern, scope of practice etc.). Almost all the SLPs rated this parameter under 'Excellent 'category. This suggests that CIQ-R has good implications in its scope of practice. The generalization of the results helps in the interventions of persons with aphasia and other disorders also.

In the present study, CIQ-R has been administered on one hundred neuro-typical individuals (age range 20 years to 70 years) in a face to face interview. It has also been administered on ten aphasic individuals (age range 20 years to 70 years). Various types and severity of aphasia were represented in the aphasia group.

Using SPSS software (version 17.0) the results obtained from the data were analyzed on various aspects. To check normality of the data, Shapiro - Wilk test was administered. Normality test revealed that the data is not normally distributed i.e., $p < 0.05$. Hence non-parametric test was administered. Mean, median, standard deviation (SD) and 95% confidence interval for mean were obtained for each domain using descriptive statistics. Further, different age groups, gender groups and other factors were compared using Kruskal -Wallis group comparison and Mann Whitney test.

The findings of the present study are broadly presented under the following headings.

- I. Performance of different age groups across all the domains in neuro-typical individuals.
(age group wise comparison)
- II. Performance of males and females across different domains of CIQ-R among different age groups (gender wise comparison).

- III. Comparison of neuro-typical individuals with respect to education among all the domains of CIQ-R.
- IV. Comparison of neuro-typical individuals with respect to occupation in all the domains of CIQ-R.
- V. Comparison of neuro-typical individuals with respect to number of languages known with all the domains of CIQ-R.
- VI. Comparison of overall scores of neuro-typical individuals with brain damaged individuals (persons with aphasia).

I. Performance of different age groups across all the domains in neuro-typical individuals. (age group wise comparison)

Home integration subscale:

Table 8 shows that on home integration subscale, all the participants of age groups 20-30 scored mean of 4.1 and 30-40 scored mean of 7.16. On the other hand 40-50 years, 50-60 years, and 60-70 years had a mean value of 5.50. The total mean values in this subscale, irrespective of gender across all the age groups was 5.87 with SD (2.3). It is evident from the values that there was increase in the mean values from 20-30 years to 5.58 in 60-70 years. But there was a good home integration in 30-40 years individuals when compared to all other age groups. From 40 to 70 years similar scores were observed i.e. scores were neither decreasing nor increasing.

Table 8: Mean, SD, median for each domain across groups

Age group		HI	SI	Productivity	ESN	CIQTotal
20-30 years	N	20	20	20	20	20
	Mean	4.130	6.40	4.95	3.10	18.580
	Median	3.550	7.00	5.00	3.00	18.450
	Std. Deviation	2.0404	1.635	2.212	2.024	4.8030
30-40 years	N	20	20	20	20	20
	Mean	7.165	7.05	4.05	3.90	22.365
	Median	7.150	7.00	4.50	4.50	24.000
	Std. Deviation	1.6943	2.064	1.761	2.125	4.8603
40-50 years	N	20	20	20	20	20
	Mean	6.430	7.05	2.70	2.80	18.980
	Median	5.500	7.00	3.00	3.00	18.500
	Std. Deviation	2.7480	2.235	1.625	2.397	5.1859
50-60 years	N	20	20	20	20	20
	Mean	5.750	5.95	2.55	1.20	15.085
	Median	5.500	6.00	2.00	1.00	15.500
	Std. Deviation	2.2170	1.877	1.669	1.399	3.4121
60-70 years	N	20	20	20	20	20
	Mean	5.580	6.10	3.00	2.00	16.830
	Median	5.000	6.00	3.00	2.00	16.150
	Std. Deviation	1.7151	1.971	1.214	2.000	5.1270

Social integration subscale:

The mean scores increased from 20-30 years till 40-50 years ranging from 6.4 to 7.5. There was slight decrease in mean scores from 50 -60 years (Mean;5.95) and 60-70 years (Mean;6).Overall mean scores for social integration irrespective of gender was 6.51. It is clear

from the table that social integration mean scores increased as the age increased, however it was reduced in older adult population (60-70 years of age).

Productivity subscale

In productivity subscale, there was a steady decrease in mean scores from 20-30 years (Mean: 4.95), 30-40 years (4.05), 40-50 years (mean: 2.70), 50-60 years (Mean: 2.55). The mean scores showed a slight increment at the age range of 60-70 years (Mean=3.00). Nevertheless, the total mean scores observed were 3.45 in this subscale of CIQ-R.

ESN Subscale

In this subscale, highest mean scores were observed in 30-40 years of age group individuals. The mean score for this age group was 3.90 with SD of 2.00. Least mean scores was observed in 50-60 years of age who had a mean score of 1.20 and SD of 1.00. From the table it is clear that 20-30 years and 40-50 years aged individuals had similar score which is towards the higher mean scores in the subscale with smaller variations in 0.5 score. The total mean values for all the participants was 2.60 (SD=1.02).

CIQ-R total

Highest overall integration was observed for 30-40 years of age group. Lowest overall integration was obtained in 50-60 years of aged individuals. There was no pattern deduced from the overall integration. However, when different age groups were considered, 20-30 years, 40-50 years participants had similar overall mean scores (18.5) and between 60-70 years there was an increase in the mean scores from 15 (50-60 years) to 16.15.

Hence, it was clear that irrespective of the different subscales of CIQ-R, the overall integration decreased from younger adults to older adult population. However, the highest community integration was observed in the second group i.e., in 30-40years of age. This integration decreased in 40-50 years and continued till 50-60 years who tend to have had lower integration scores. Nonetheless, this decrement trend was not followed by 60-70 years aged individuals

Further, Kruskal Wallis test and Man Whitney U test was carried out, within each age group for all the subscales. Overall mean was to detect the differences if any between age groups. The results for the same are tabulated below.

Table 9: Kruskal Wallis test results with significance values across each subscales of CIQ-R.

	HI	SI	Productivity	ESN	CIQTotal
Chi-Square	19.930	7.926	19.480	17.270	23.129
Df	4	4	4	4	4
p- value	.001**	.094	.001**	.002**	.000

*P<0.05, **P<0.01

Kruskal Wallis test for age group revealed that there was a significant difference in home integration (p<0.01), productivity (p<0.01) ,ESN (p<0.01) and in CIQ-R total (p<0.01). No significant difference was observed for social integration (p>0.01)

Table 10: Mean rank scores for age groups

Age group	HI		SI		Productivity		ESN		CIQ-Total	
	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean
		Rank		Rank		Rank		rank		Rank
group 1	20	29.70	20	47.73	20	69.83	20	57.40	20	51.48
group 2	20	69.63	20	58.70	20	60.68	20	66.90	20	73.28
group 3	20	55.43	20	61.33	20	41.03	20	52.80	20	54.50
group 4	20	50.43	20	41.65	20	36.80	20	32.60	20	31.58
group 5	20	47.33	20	43.10	20	44.18	20	42.80	20	41.68

Table 10 shows the mean ranks for each group considered in the study. It shows that, group 2 had highest ranking in home integration and group 1 is the lowest. After group2, the mean ranks showed a descending trend which tends to decrease from 55.4 mean rank (Group 3), 50.43 (Group 4) to 47.33 (Group 5).In social integration subscale, it can be deduced that, group 2(Mean rank: 58.7) and group 3(Mean rank: 61.3) had higher rankings compared to other groups. Lowest rank was established by group4 with a mean rank of 41.6.

In productivity subscale lowest rank was scored by group 4 (Mean rank: 36.8) and highest was by group 1 (Mean rank: 69.8). Similarly, highest ranking was for group 2 (Mean rank: 66.9) and lowest was for group 4(Mean rank: 32.6) in ESN domain. When CIQ-R total was considered from the table it is clear that lowest rank was for group 4 (Mean rank:31.4) and highest for group 2(Mean rank :73.2)

Further Mann Whitney U test was done to compare between the groups.

Table 11: Mann Whitney U test results for group wise comparison

GROUPS	HI		P		ESN		CIQ-Total	
	z- value	p-value	z- value	p-value	z- value	p-value	z- value	p-value
1 v/s 2	4.003	0.002*	1.230	0.211	1.293	0.192	2.481	0.018*
1 Vs 3	2.601	0.001*	3.121	0.002**	0.391	0.691	0.333	0.731
1 Vs 4	2.297	0.028	3.372	0.001**	2.972	0.003**	2.234	0.025*
1 Vs 5	2.391	0.164	2.882	0.004**	1.731	0.089	1.111	0.267
2 Vs 3	1.366	0.172	2.318	0.020*	1.418	0.158	2.359	0.018*
2 Vs 4	2.165	0.030**	2.609	0.009**	3.679	0.000**	4.388	0.000**
2 Vs 5	2.880	0.004*	1.928	0.054*	2.639	0.008**	3.115	0.002**
3 Vs 4	0.559	0.576	0.482	0.630	2.079	0.038*	2.643	0.008**
3 Vs 5	0.870	0.398	0.813	0.820	0.299	0.314	0.123	0.127
4 Vs 5	0.380	0.704	1.090	0.276	1.195	0.232	0.989	0.327

Mann Whitney test revealed that, there was a significant difference between group1 (>20 to ≤30 years) and group 2 (>30 to ≤40 years) i.e. $p < 0.05$ in home integration and in CIQ-total. There was a statistically significant difference when group 1(>20 to ≤30 years) and group 3(>40 to ≤50 years), were compared. For ESN, productivity and CIQ-R total scores, there was a significant difference between group 1(>20 to ≤30 years) and group 4(>50 to ≤ 60). Between group 1(>20 to ≤30 years) and group 5(>60 to ≤ 70 years), there was a significant difference in productivity subscale.

When group 2(>30 to ≤40 years) was compared with group 3(>40 to ≤50 years), significant difference was found only in CIQ total scores. Between group 2(>30 to ≤40 years) and group 4(>50 to ≤ 60 years), also among group 2(>30 to ≤40 years) and group 5(>60 to ≤ 70 years), all the subscales had significant differences. Among group 3(>40 to ≤50 years) and group 4(>50 to ≤ 60), statistically significant difference was found only in ESN and CIQ-R total scores. In group 3 (>40 to ≤50 years and group 5(>60 to ≤ 70 years) and in group 4(>50 to ≤ 60) and group 5(>60 to ≤ 70 years), there was no statistically significant difference found among the subscales.

The effect of age on community integration is illustrated in the above results. In a nutshell, the present study aimed to check the level of community integration in different age groups. From these results following conclusions can be drawn-

- There was increase in home integration from younger age till adulthood.
- As age increased social integration also increased till 40-50 years, after which there was a decrease in social integration in older adult population.
- There was steady decline in the productivity subscale from 20 years till 60 years of age. Later, from 60-70 years, little increase in productivity was observed.
- ESN subscale followed similar results as that of productivity subscale wherein, younger individuals had higher ESN integration. It decreased till 60 years of age and slight increase in scores among older adults.
- Adults between 30-40 years had highest community integration compared to any age group. There was decrease in overall community integration in older adult population. However, integration of 60-70 years was better when compared to that of 50-60 years.
- 30-40 years age population had highest integration in all domains compared to other age groups.

Younger adults i.e., between 30-40 years tend to have achieved independent living due to transition from teenage to adulthood. The concept of self-efficacy can be recalled at this point. According to Bandura (1970) self-efficacy relates to the beliefs that each person has about their own capacity to function based on their perceived locus of control. Individual with strong self-efficacy feel empowered to shape their future. These individuals reported to have higher quality of life as well. Hence younger age individuals have higher self-efficacy which leads to better community integration compared to older adults(Henson, 2016). This self-efficacy in- turn increases one's independence. This independency leads to good integration in all the domains of life. In the scoring of CIQ-R, a point of 2 is given when a particular task/work is done alone and a point of 1 is given when it is done with the help .This poses that the increased independency among younger adults would lead to better integration scores in CIQ-R and thus the scores decline in the age range of 50-60 years who becomes little dependent on their day to day living.

The result of the present study gets support from existing research where many authors have reported that younger adult individuals have higher integration scores compared to older adults (Dijkers, 1997; Kaplan, 2001; Papathanasiou, Coppens, & Potagas, 2013). Dijkers(1997) reported a tendency for younger age to be associated with greater integration on the CIQ. Kaplan (2001) reported that older age was significantly related to poorer community integration both for the total CIQ and for each subscale.

Schmidt et al. (1995) investigated the relationship of age and gender with community integration. The results of their study showed that, individuals in the groups ranging from 30-59 years of age had the highest scores on the home integration scales. Similarly, in addition to this, in this study also, younger participants had good home integration compared to other age groups. One reason could be that, younger adults tend to have more responsibilities in order to maintain a

good home environment i.e. to look after children, and buying grocery etc. These types of questions are related to home integration in CIQ-R subscale. Often parents in this age group tend to have more responsibilities than others.

When it comes to older adults, change in social role could have resulted in slight increase in their community integration scores, specifically with respect to home integration. This could be because, social roles and responsibilities of an older adult within household varies with social expectations.

In addition to that, the result of social integration and productivity reveals that, there is steady decline in the productivity subscale from 20 years till 60 years of age. This is because, younger age individuals tend to have higher inquisitiveness, curiosity etc. to explore the environment around them. This helps them in maintaining a good relationship in the community in which they are living. During this age, individuals try to build relationships which in turn will improve their integration in the society. Also, at this age they become economically self-sufficient. It benefits them to explore, travel around etc. Since questions in social integration subscale are related to their relations with peer group, frequency of visits to relatives house etc., younger adults would have received higher scores compared to older adults.

The main reason for older adults to be less integrated in the society could be economic dependency. Elderly people may feel a lack of control over finances because most of them will be on fixed incomes. They become cognitively also dependent on others, which limits their role in the society. To add on, research on personal relationships has shown that older adults intentionally maintain distance from some of their relationships, retaining only the ones who they know they can maintain.

Productivity subscale is related to their work. By the age of 60-70 often they get retirement from their job. Prior to retirement, many adults begin to develop hobbies or spare time occupation to engage in during retirement. This would include engaging in volunteering activities. This fact would have contributed more for the increase in the scores of productivity among 60-70 years of age. Also, CIQ-R has questions related to frequency of volunteering activities, total duration of work in the past month etc .All these would have definitely increased the scores in productivity among older adults.

This is in line with other research findings where similar results are shown. Schmidt et al (1995) in their group comparison analyses showed individuals from the youngest age group (16-19) had the highest scores for social and productivity subscales and individuals from the oldest age group (>60) had the lowest scores for the social integration subscale.

Use of technology is a recent advancement in this era. However, in this study, the integration related to ESN subscale is higher for younger age group (between 20-30 years). There is a continues decline in use of technology after 30 years of age up to 60 years, later slight increase in its use is observed. Owing to the fact that, younger population is technologically driven compared to older adults. Also, questions were based on use of social media like Facebook, Twitter, and WhatsApp. This aspect of technology is used less in Indian context specifically by elder population, who likes more of face to face communication. Hence, cultural background comes into picture. Computers play a large role in keeping older adults connected to family and friends and developing new relations. Nowadays most of the older adults live alone whose children live in other countries. This could be one of the possible reasons for the population between 60-70 years to gain higher integration in ESN subscale than 50-60 years Results indicate that computers have enabled older adults to remain in touch and stay current with activities in the

lives of their children grand-children and friends who have moved away. Similar to this study, Australian normative data of CIQ-R by Winkler et al (2003) showed that, younger age group (20-39 years) had highest overall integration. There was decrease in the integration from 30 years to 65 years of age. Thus, the present study does provide a supportive evidence for the fact that younger age population tends to have higher community integration compared to any age groups. This is now evident that it is similar even in Indian context.

II. Performance of males and females across different domains of CIQ-R among different age groups (gender wise comparison)

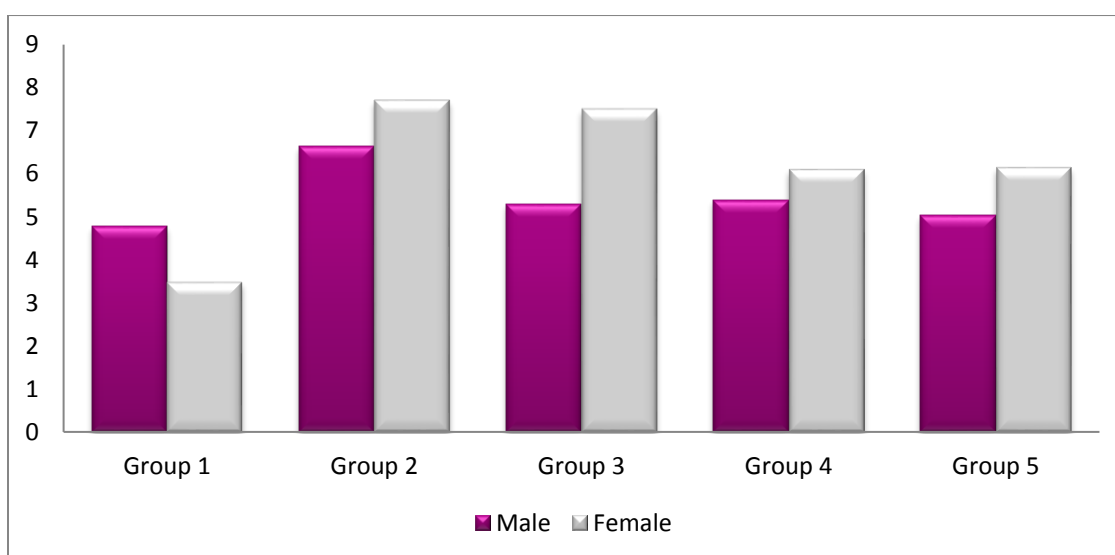
The explanations below are based on different subscales of CIQ-R .Based on mean, median, standard deviation, 95% confidence interval for mean is depicted in each of the tables with respect to gender and group wise.

Home Integration subscale

From Table 12, one can deduce that in group 1 (20-30 years) males had higher home integration scores (Mean: 4.78) compared to that of females (Mean-3.48). In the age range of 30-40 years and 40-50 years, females had higher integration scores (Mean scores ranging from 7.7 to 7.5) Males had mean score of 6.63 in 30-40 years of age and sudden decrease in scores between 40-50 years of age(Mean:5.5).However, after steady increase in home integration from 20-30 years of age, the mean scores remained same in both males and females between 50-60 years(Males:5.39, Females:6.10) and 60-70 years of age(Males;5.02, Females:6.14)

Table 12: Mean, median, standard deviation (SD) and 95% Confidence interval for mean across different age groups with respect to gender for Home Integration subscale

Age groups	Gender	N	Mean	Standard deviation (SD)	Median	95% Confidence Interval for mean	
						Minimum	Maximum
Group 1	Male	10	4.78	1.80	3.80	3.49	6.06
	Female	10	3.48	2.14	3.80	1.94	5.01
Group 2	Male	10	6.63	1.58	6.50	5.4	7.7
	Female	10	7.70	1.70	2.22	6.4	8.9
Group 3	Male	10	5.30	2.45	4.65	3.6	7.1
	Female	10	7.50	2.71	6.50	5.5	9.4
Group 4	Male	10	5.39	2.18	5.00	3.8	6.9
	Female	10	6.10	2.30	6.00	4.4	7.7
Group 5	Male	10	5.02	0.91	4.60	4.3	5.6
	Female	10	6.14	2.16	5.15	4.5	7.6



Graph 1: Mean scores of males and females across group for home integration

All together when Table 12 was analyzed, it was clear that females maintain higher home integration scores when compared to that of males across all age groups. However, highest mean scores were observed in the group 2(30- 40 years) for both males and females.

Social integration subscale:

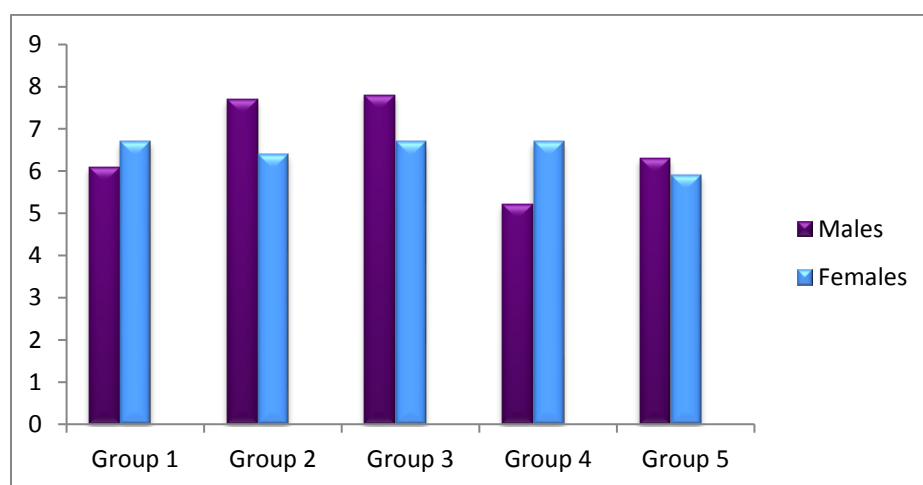
Mean scores of males (6.10) were almost similar to that of female scores (6.70) in the age range of 20-30 years. But between 30-40 years of age, males had better social integration (Mean=7.70) corresponding to females (Mean: 6.40), who had slightly lesser scores. Similar course was maintained by males even in 40-50 years of age. That is, males had higher mean scores(7.80) than females (6.70). In 50-60 years there was a decrease in the means scores of men (5.20), women had mean score of 6.70. Again in the group 5 i.e., between 60-70 years of age, mean score of males was 6.30 with slight increased score than group 4. Females in the age of 60-70 years have mean score of 5.90. Overall the scores of males and females across different age groups, 30-40 years individuals had better social integration than any other groups.

Productivity subscale:

In the productivity subscale, males in the age range of 20-30 years had highest mean scores(5.30) and lowest mean scores between the age range of 50-60 (3.40), males continued to have same score even between 60-70 years of age. Highest scores for females were in group 1 i.e., 20-30 years of age and there was gradual decrease in the mean score from 30 -40 years (3.30) to 2.80 in 40-50 years of age. The mean scores of females were lowest in 50-60 years of age (Mean: 1.70). The scores tend to have increased slightly in group 6 i.e., 2.60 in 60-70 years of age.

Table 13: Mean median, standard deviation (SD) and 95% Confidence interval for mean across different age groups with respect to gender for Social Integration subscale.

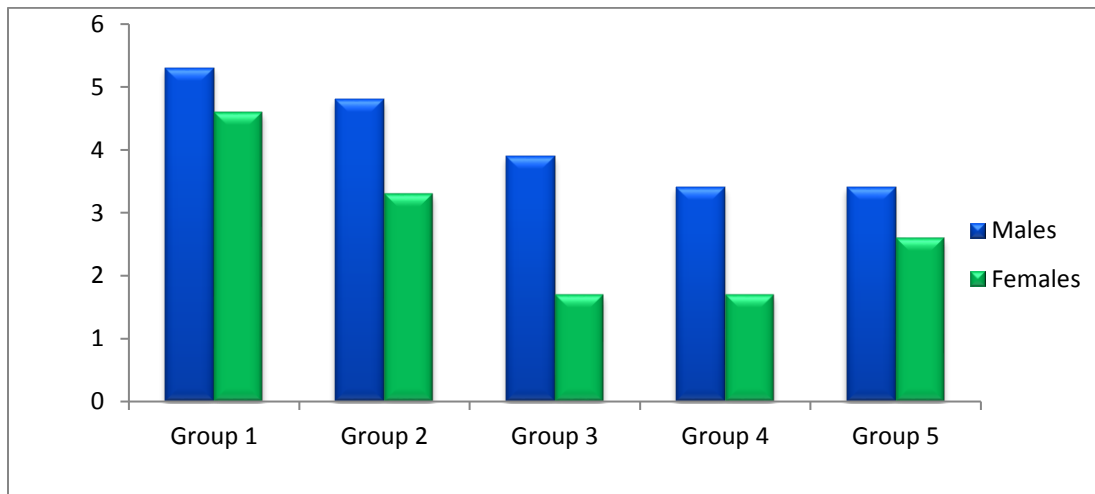
Age groups	Gender	N	Mean	Standard deviation (SD)	Median	95% Confidence Interval for mean	
Group 1	Male	10	6.10	1.79	6.50	4.82	7.38
	Female	10	6.70	1.49	7.0	5.63	7.77
Group 2	Male	10	7.70	1.76	8.00	6.4	8.9
	Female	10	6.40	2.22	7.00	4.8	7.9
Group 3	Male	10	7.80	1.75	7.50	6.5	9.0
	Female	10	6.70	2.00	7.00	5.2	8.1
Group 4	Male	10	5.20	1.98	5.00	3.7	6.6
	Female	10	6.70	1.49	7.00	5.6	7.7
Group 5	Male	10	6.30	2.11	6.50	4.7	7.8
	Female	10	5.90	1.91	5.50	4.5	7.2



Graph 2: mean scores of males and females for social integration subscale

Table 14: Mean Median, Standard deviation (SD) and 95% Confidence interval for mean across different age groups with respect to gender for Productivity subscale.

Age groups	Gender	N	Mean	Standard deviation (SD)	Median	95% Confidence Interval for mean	
Group 1	Male	10	5.30	1.76	5.00	4.82	7.38
	Female	10	4.60	2.63	4.50	2.42	6.48
Group 2	Male	10	4.80	1.31	5.00	3.8	5.7
	Female	10	3.30	1.88	3.00	1.9	4.6
Group 3	Male	10	3.90	0.99	4.00	3.1	4.6
	Female	10	1.70	1.05	1.50	0.9	2.4
Group 4	Male	10	3.40	1.71	4.00	2.1	4.6
	Female	10	1.70	1.16	2.00	0.8	2.5
Group 5	Male	10	3.40	1.50	3.00	2.3	4.4
	Female	10	2.60	0.66	2.50	2.1	3.1



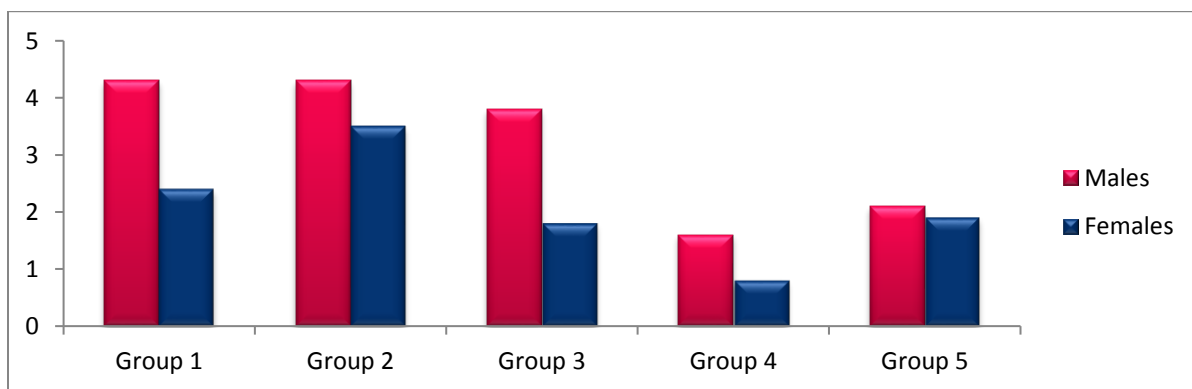
Graph 3: Mean scores of males and females in productivity subscale.

Electronic social networking subscale:

Unlike in other subscales where females tend to comparatively have had higher scores, in this subscale they had lesser score from group 1 itself. Between 20-30 years, mean scores for female was 1.90, for males it is 4.30. No other subscales had this big difference in the mean scores.

Table 15: Mean, median, standard deviation (SD) and 95% Confidence interval for mean across different age groups with respect to gender for ESN subscale.

Age groups	Gender	N	Mean	Standard deviation (SD)	Median	95% Confidence Interval for mean	
Group 1	Male	10	4.30	1.73	4.00	3.08	5.52
	Female	10	1.90	1.59	2.00	0.76	3.74
Group 2	Male	10	4.30	1.41	4.50	3.2	5.3
	Female	10	3.50	2.67	4.00	1.5	5.4
Group 3	Male	10	3.80	1.98	4.00	2.3	5.2
	Female	10	1.80	2.44	0.50	0.05	3.5
Group 4	Male	10	1.60	1.35	1.00	0.6	2.5
	Female	10	0.80	1.39	0.10	0.20	1.8
Group 5	Male	10	2.10	2.07	1.50	0.6	3.5
	Female	10	1.90	2.02	2.00	0.45	3.3

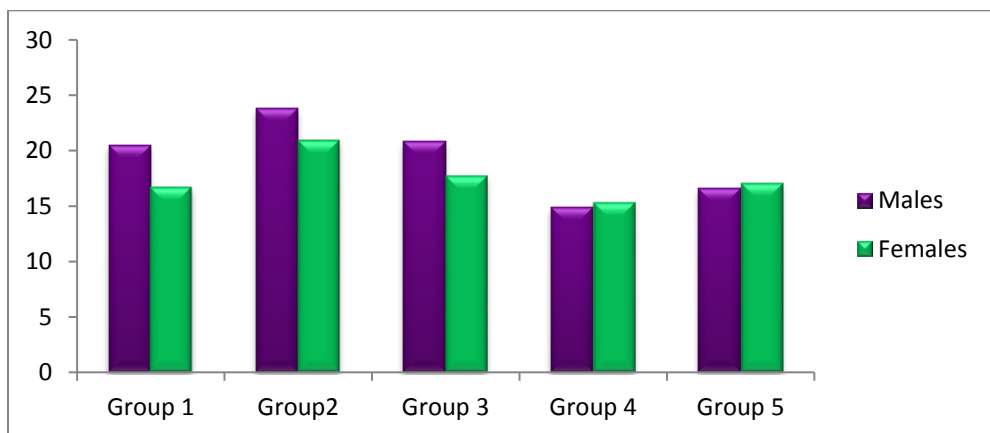


Graph 4: mean scores for both males and females with respect to ESN subscale.

Highest mean scores for both males (Mean: 4.30) and females (Mean: 3.50) was in 30-40 years of age. From group 3(40-50 years) to group 5(60-70 years) females had lower scores compared to males. Lowest scores for females was in group 4 (Mean: 0.80).Males showed a gradual decrease in using electronic social networking from 20 years through 70 years of age. Overall, males had higher mean scores in this subscale, which showed a reduction trend from younger age to older age groups. However, females showed lower scores from younger age itself, it continued till 70 years of age with the lowest score in 50-60 years of age.

CIQ-R total scores

A minimum of 14.86 (SD: 3.16) and maximum of 23.83 (SD: 2.76) in the age range of 50-60 years and 30-40 years of age was scored by males and mean of 15.31 (SD: 3.79) and 20.90 (SD: 6.1) was obtained by female participants in the overall community integration .All the means of other groups fell within this boundary of maximum and minimum scores. From the table, it is clear that group 2 (30-40 years) outperformed all the other groups in the study in overall integration subscale.



Graph 5: Mean scores of males and females for overall community integration

Table 16: Mean Median, Standard deviation (SD) and 95% Confidence interval for mean across different age groups with respect to gender for CIQ-R total.

Age groups	Gender	N	Mean	Standard deviation (SD)	Median	95% Confidence Interval for mean	
Group 1	Male	10	20.48	4.39	20.45	17.33	23.60
	Female	10	16.68	4.62	16.15	13.37	19.38
Group 2	Male	10	23.83	2.76	25.00	21.8	25.8
	Female	10	20.90	6.11	23.00	16.5	25.2
Group 3	Male	10	20.86	4.20	21.00	17.8	23.8
	Female	10	17.70	4.62	16.50	14.3	21.0
Group 4	Male	10	14.86	3.16	15.50	12.5	17.1
	Female	10	15.31	3.79	15.80	12.5	18.0
Group 5	Male	10	16.62	4.99	15.80	13.0	20.1
	Female	10	17.04	5.51	16.65	13.0	20.9

Additionally Mann Whitney U test is done to see the gender wise differences within each subscale. The results of this test are tabulated below in Table 17.

Table 17: Mann Whitney U test results for gender difference

	HI	SI	Productivity	ESN	CIQTotal
Z	1.847	.227	3.985	3.038	1.697
p -value	.065**	.820	.000**	.002**	.090*

(*p<0.05,**p<0.01)

From the table it is clear that there is significant difference in all (HI,P,ESN and total scores)the domains of CIQ-R with respect to gender except for Social integration which has $p>0.01$.

To summarize,

- Females had higher home integration compared to males in all the groups.
- As age increased, social integration in males also increased. Whereas females maintained a constant level in social integration.
- Productivity decreased in females as age increased. Males tend to have had highest productivity when age increases.
- Females had less integration in ESN throughout the age groups. But males had good ESN integration in younger age which decreased as age increased.
- In overall community integration scores, males had higher community integration compared to females irrespective of their age.

The above results can be attributed to many reasons. First of all, the questions in home integration subscale are typically related to maintain and monitoring the household activities. Like for example” Who prepares food at your home?”,” Who takes care of the children at home?” etc. Hence, when females across all the age groups are considered, they tend to have maintained higher home integration scores compared to males. Another important factor that needs to be considered here is that females tend to have higher home integration due to their social expectations. From the past in the society it has been developed that household activities or work needs to be taken care of by females, and those that are related to outside home environment such as going for work which financially boosts the family is for males. This is

often the Indian mentality which has been strictly followed in our society. Our society expects female to be working at home, taking care of children. It can be concluded that the results are consistent with social expectations of females with respect to Indian culture and society. Hence, this can be one of the reasons for the females having higher home integration scores.

When we consider social integration, results shows that males have higher scores compared to females. The same fact that social roles followed by our society can be recalled at this point as well .Males have a “duty” in the society to go out for work. This sole fact can be reasoned out for the higher scores in males. When we go out for work, we automatically communicate with the people around.

Moreover some of the questions in the social integration subscale are as follows:” How often in a month do you visit relatives?”, “How many times in a month do you participate in leisure activities?”etc. Male’s responsibilities increase as per the expectations of the society. The change in social roles from being a Son, Brother, Husband to a Father, later to uncle and/or grandfather makes them responsible in their own way .Each and every social role demands very different capabilities from a person. Males will have to be more outgoing in the society compared to females. This change would have resulted in a positive way i.e., increase in the social integration among males.

Females are often dependent on males especially in the Indian society. Moreover not everyone is independent. This dependency might have reduced the scores Also, the scoring in the CIQ-R is based on the dependency of the person for a particular activity. Going to a movie alone, shopping alone etc. is not practiced by Indian population (specifically by females). Thus, this might have resulted in the lower scores compared to males.

Both males and females have followed a similar pattern in productivity subscale i.e., it is highest in younger age and decreases up to 50-60 years, later slight increase is observed. Productivity is nothing but, utilizing the time in order to empower oneself. It is observed to be highest in youngsters below 30 years. This is because, most of them will be working towards one goal that is nothing but to build their family and shape their future. This could be one reason for both males and females having highest productivity. It can be observed that there is a social influence also. After reaching 60 years, most of them would search for work that satisfies their interests in life. Hence, their willingness to work would have attributed towards increase in scores.

India did not emerge in technological field until recently. When there was a boom in technology, younger generation flew towards technology exploring and experiencing new things. At younger age, even though males had higher integration in ESN, females had less integration across age groups. Again effect of social and roles and responsibilities can be remembered. Improvement in technology has affected males much, and not females. However, the use of technology is reported in the study, but it is relatively poor when compared to males.

In a nutshell, change in social roles brings more changes in males compared to females. This can be attributed to increase in the overall integration scores in males. Along with this, the scoring of CIQ-R depends on the level of dependency of the person i.e. a score of 2 is given if the particular activity is done by himself or herself. A score of one is given, if it is done by taking help from other and a score of 0 if it is completely done by someone else. This could have also resulted in lower scores of females because due to ethno-cultural variations, females in India (Karnataka region) are more dependent on the male counterpart in their family. Even after lot of women empowerment education, results shows that males are more integrated in the society than females.

The result of the present study does get support from few authors. Dijkers (1997) reviewed four studies that reported the effects of age and, the results of the findings suggest that, females indicated greater integration into the home, while male scores typically suggested more integration into the productivity domain. Kaplan (2001) demonstrated similar effects of gender around home integration and productivity. It has been suggested that a lack of more traditional, male household tasks may account for some of the reported differences in home integration (Dijkers 1997). Kaplan (2001) reasons out that, CIQ separates household activities from productive activities. This may be penalizing for the homemakers who continue to work at home, because home making activities are always shred by other family members(Sanders, 1999).

Similarly, a normative data developed by Willer et al (2013) for CIQ-R shows that, Females have higher home integration, social integration and integration in ESN, and less integration in productivity. Similarly, males have higher overall community integration when compared to females.

III. Comparison of neuro-typical individuals with respect to Education among all the domains of CIQ-R.

Table 18: Mean, SD and Median values with respect to education for all the subscales of CIQ-R

Education		HI	SI	Productivity	ESN	CIQTotal
Primary	N	21	21	21	21	21
	Mean	6.810	5.43	2.00	.62	15.095
	Std. Deviation	2.3586	1.748	1.449	1.071	4.4835
	Median	7.000	5.00	2.00	.00	15.000
secondary	N	10	10	10	10	10
	Mean	5.760	6.60	3.20	1.90	17.460
	Std. Deviation	1.6801	1.647	1.874	2.079	5.4698
	Median	6.000	7.00	2.50	1.50	17.150
UG	N	41	41	41	41	41
	Mean	5.351	6.76	3.63	2.80	18.344
	Std. Deviation	2.2285	1.959	1.639	2.239	4.8357
	Median	5.000	7.00	4.00	3.00	18.000
PG	N	28	28	28	28	28
	Mean	5.754	7.07	4.43	4.04	21.396
	Std. Deviation	2.4598	1.864	1.952	1.527	4.3566
	Median	5.800	7.50	5.00	4.00	20.250
Total	N	100	100	100	100	100
	Mean	5.811	6.55	3.47	2.60	18.428
	Std. Deviation	2.3103	1.930	1.899	2.184	5.1333
	Median	5.600	7.00	3.00	2.50	18.000

The education variable was subcategorized into four levels. They were primary education, secondary education, undergraduate (UG), post graduate (PG). The total participants with primary education were 21 in number and 10 in secondary education. Participants who had completed their graduation were 41 in total and those with a post-graduation degree were 28 in number.

Home integration subscale:

Participants who received primary education, had highest mean score in home integration compared to all other categories. Meanwhile a mean score ranging from 5.35 to 5.75 were scored by the participants who had completed their secondary education to post graduation respectively. However, mean scores were similar in participants who had completed their secondary education and those with post-graduation.

Social integration subscale:

Participants in primary education category had overall mean score of 5.43 in social integration. It is obvious from Table 18 that the mean scores in this subscale followed a trend, by the gradual increase of scores from 5.43 (primary education) to 7.07 (post-graduation). This shows that as the qualification of an individual increases, his social interactions are more in the community.

Productivity subscale:

The mean scores for productivity subscale followed a trend where increased scores from 2.00 to 7.07 were observed. Participants with primary education had lowest mean scores in this subscale. A slight increase in score from 2 to 3.20 was noticed in those who had secondary education. Those who had completed graduation obtained mean score of 3.63 and 4.43 for those who had completed their post-graduation. This clearly shows that, higher education leads to higher productivity in the community.

ESN subscale:

Unlike other subscales, minimum score was obtained for individuals with primary education with a mean score of 0.62 from primary to PG level, there was a gradual increase in the mean

scores. Participants with secondary education had acquired mean score of 1.90. For those with graduation had a mean score of 3.63 (increased mean). Mean scores became better in those who had post-graduation degree. This result clearly shows that, as qualification of the person improves, use of technology is more.

CIQ-R total scores:

Overall integration scores with respect to different education levels, those with highest qualification i.e., post graduate had highest community integration (Mean: 21.3). Meanwhile, those with least education i.e., primary education had least community integration (Mean: 15.09). There was a clear increase in the integration scores as the qualification of the person increases.

Further, a Kruskal Wallis test was carried out to know the significant difference between education levels among all the subscales of CIQ-R. The results for the same are tabulated in table 19 below.

Table 19: Kruskal willies test results education wise.

	HI	SI	Productivity	ESN	CIQTotal
Chi-Square	5.674	9.221	20.709	32.645	17.887
P-values	.129	.026*	.000**	.000**	.000**

(** p<0.01,p<0.05*)

There is a significant difference in social integration, productivity, ESN and also in total integration scores.(p<0.01). However no statistically significant values were observed for home integration subscale (p>0.01)

Table 20 shows the mean ranks of different levels of education with respect to integration domain

Table 20: Mean ranks for education across various domains of CIQ-R

HI			SI		Productivity		ESN		CIQ-Total	
Education	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean
		Rank		Rank		Rank		rank		Rank
Primary	21	61.90	21	34.48	21	27.98	21	23.69	21	32.40
Secondary	10	53.70	10	50.95	10	46.05	10	41.40	10	44.80
UG	41	43.68	41	52.93	41	53.38	41	53.38	41	49.76
PG	28	50.79	28	58.80	28	64.77	28	69.64	28	67.20

From this, it can be inferred that, undergraduates have lower Home integration (mean rank: 43.6) and those with primary education have highest home integration (mean rank: 61). Other levels of education rank between these two points. In social integration domain, those with primary education are least integrated (mean rank: 34.4) when compared to post graduates who have good integration (mean rank: 58.8). Similarly in productivity subscale, those individuals with primary education are lowest compared to post graduates who have good integration in this domain also. Among levels of education, primary education level, have lowest rank (mean rank: 23.9) in ESN subscale again post graduated having highest or good scores (mean rank: 69.6). When we look into overall integration, primary have secured lowest rank (mean rank: 32.4) and post graduates have highest mean rankings (Mean rank: 67.2).

Further, Mann Whitney U test was carried out within each levels of education among all the subscales and overall mean to detect the differences if any. The results are tabulated below in Table 21.

Table 21: Results of Mann Whitney U test for education levels across all the subscales.

Education	SI		P		ESN		CIQ-Total	
	Z- Value	p-Value	Z- Value	p-Value	Z- Value	p-Value	Z- Value	p-Value
Primary v/s Secondary	1.651	0.099*	1.807	0.071	1.859	0.063	1.122	0.262
Primary v/s UG	2.385	0.017*	3.511	0.000**	3.923	0.000**	2.308	0.021*
Primary v/s PG	2.866	0.004**	4.137	0.000**	5.571	0.000**	4.014	0.000**
Secondary v/s UG	0.206	0.837	0.779	0.436	1.192	0.233	0.487	0.626
Secondary v/s PG	0.858	0.391	1.813	0.070	2.700	0.007	2.091	0.036*
UG v/s PG	0.830	0.406	1.790	0.073	2.315	0.021*	2.520	0.012*

($p < 0.05^*$, $p < 0.01^{**}$)

Primary level of education has been compared with secondary level, along with UG and PG for all the subscales of CIQ-R. In social integration subscale, all the three levels of education was had statistically significant values i.e., $p < 0.01$. When secondary level of education is compared with UG and PG, the results show that they are not statistically significant. Again, between UG and PG there is no statistically significant value established for this subscale.

In productivity subscale, between primary and secondary education levels, $p > 0.01$. Hence, they are not statistically significant. When primary education is compared with higher levels such as UG and PG; statistically significant values are obtained between them. None of the other levels of education showed statistically significant values in this subscales i.e., $p > 0.01$.

Similar to productivity subscale, in ESN also, primary and UG and primary and PG level of education had a good significant results i.e., $p < 0.01$, but primary and secondary and secondary and UG education did not show the significance.

Additionally, from the Table-21 it is observed that, within CIQ-R total Primary and secondary education did not show statistically significant values. Yet, like other subscales there was statistically significant values established for primary and UG and primary and PG. Meanwhile, secondary and UG did not indicate statistically significant value. However, this trend was not observed when comparisons were made between secondary and PG and PG as both the groups established statistically significant values i.e., $p < 0.01$.

It can be concluded that, between primary and higher education levels (Primary and UG and primary and PG) statistically significant values were achieved in all the subscales when compared to other levels of education.

Effect of education on community integration is summarized below;

- As education level increases, social integration, ESN, productivity and overall community integration increases.
- As there is increase in education level, the home integration reduces.

The above results of education and its effect on subscales of community integration can be ascribed to many reasons such as; education helps us to gain more knowledge about the environment around us .By giving illustrations and examples, education helps to discover one's self. By gaining knowledge about the world/ environment around, a person becomes more independent to explore surrounding in his own way.

From the results it is clear that, education improves a person's social integration, productivity, ESN and overall community integration.

Education gives an opportunity for the individuals to interact with more people. It in turn helps for building more relationships. Also, education alleviates a skill in an individual. Developing a skill in turn helps a person to gain identity in the society. This creates better productivity in the society. Hence, education helps to shape overall personality of the person.

It is clear that, community integration subscales are inter-related to each other. Thus higher the education, higher is the integration in the community.

Due to advent in the technology, everyone depends on it in their professional life as well as personal life. Everybody wants to get in touch with each other by using social networking sites like face book, snap chat etc. This has improved the scores in those who are educated when compared to those with lower education. Thus, education improves the use of technology in turn contributing to the overall community integration in a person.

Another important result to be discussed in this section is that, education decreases the home integration. As a person gets more education, the quality time spent at home and also with family members decreases. This would have definitely affected the overall scores in the home integration subscale. This is also because of the fact that, the demands that education puts on a person, and also the expectation of the society when a person is more educated. Total expenditure by a person for getting educated also makes him/her to be more productive in the society. Every individual wants to earn. Earning is based on the skill that he or she has acquired in education. Hence, this automatically reduces the overall time spent with the family, affecting the integration at home.

Dejikers (1997) reports that as education level of the individual increases, his home integration decreases and social integration improves irrespective of gender. More education is

associated with better integration in all three dimensions (Heinemann & Whiteneck 1995) Similarly, study by Kaplan(2001) considered both neuro-typical individuals and TBI individuals report that, higher CIQ total scores were strongly related to the level of education of the individuals. Australian normative data gives a similar notion about the education level and overall integration in the community. The mean scores were higher for social integration, productivity and overall social integration for the participants who live in urban areas. Thus this study, adds on information to the existing reports in literature that, higher education status is related to higher integration in the community

IV. Comparison of neuro-typical individuals with respect to occupation in all the domains

Table 22: Mean, standard deviation, median for occupation across different subscale.

Occupation		HI	SI	Productivity	ESN	CIQTotal
Student	N	6	6	6	6	6
	Mean	3.0	6.0	5.33	3.17	18.167
	Std. Deviation	1.89	2.098	1.84	1.16	4.30
	Median	3.0	5.50	5.50	3.50	18.0
Working	N	49	49	49	49	49
	Mean	5.808	6.82	4.27	3.35	20.088
	Std. Deviation	2.1491	1.922	1.741	1.985	4.8443
	Median	5.000	7.00	4.00	4.00	20.000
not working	N	35	35	35	35	35
	Mean	6.503	6.34	2.11	1.60	16.703
	Std. Deviation	2.4968	1.830	1.278	2.131	4.9251
	Median	6.000	7.00	2.00	.00	16.300
Retired	N	10	10	10	10	10
	Mean	5.090	6.30	3.20	2.10	16.490
	Std. Deviation	.9061	2.312	1.549	2.470	5.6536
	Median	4.950	6.50	2.50	1.00	15.800

For easy understanding of the data, the occupation has been sub categorized into student, working, not working and retired. Among students the total number of participants was six. In working group N: 49, among not working there were 35 participants and in retired category, total participants were 10. Accordingly the results are presented with respect to various subscales of CIQ-R.

Home integration:

It can be speculated from the Table 22 that, maximum home integration (6.5) was achieved by participants who were not working. Minimum home integration (3.00) was obtained by students. Within working and retired category the mean scores for this subscale (Mean:5.8) were same. On the whole it was the not working participants who were integrated more at home compared to any other participants irrespective of their age.

Social integration:

In social integration subscale, students are reported to have total mean of 6.00 with SD2.0. Later there was a steady increase in the mean scores in this subscale from 6.00 to 6.30. Working participants had obtained a mean score of 6.82 and not-working 6.34 and for those who were retired gained a mean score of 6.50. This clearly indicates that, working participants had higher social integration in the community when compared to other population.

Productivity:

Maximum productivity mean scores were obtained by students (Mean=5.33). Unlike other subscales, here there was a gradual decrease in the mean scores from 5.3 to 2.1 in not working participants. However, there was increase in the total mean scores in retired participants. This

indicates that there was increase in the productivity, in turn actively participating in the society as one gets retired. Minimum mean scores were obtained by not working participants with a mean score of 2.1.

ESN:

It is obvious from Table -22 that students (mean: 3.1) and working (mean: 3.3) individuals had almost similar total mean scores. But the mean scores was lesser in not working participants (mean: 1.60) for this subscale. However, there was a slight increase in the mean scores of retired individuals (mean: 2.10). This shows that use of technology is more in students, working age population and also in retired individuals when compared to not working participants.

CIQ-R total

Maximum mean scores were observed for working participants with a mean of 20.08 and minimum mean scores are seen in not working (mean=16.7).However there is slight difference in scores between retired population (mean=16.49) and not working participants. Students have scored a mean score of 18.1 which is nearing to the maximum scores of the subscale. This shows that over all community integration is by the population who are working and least by the retired and not- working individuals.

Table-23 shows, level of significance for various domains of CIQ-R which are examined using Kruskal Wallis test.

Table 23: Kruskal Wallis test result across group for occupation

	HI	SI	Productivity	ESN	CIQTotal
Chi-Square	12.467	1.803	33.195	15.751	11.110
p-value	.006*	.614	.000**	.001**	.011*

(P<0.05*, p<0.01**)

From the above table it is clear that, there is a statistically significant difference for home integration, productivity, ESN and overall CIQ-R total scores. However, there were no statistically significant differences for social integration domain in occupation.

Following is the mean ranks for different categories among occupation for different subscales of CIQ-R. The details are shown in Table 24, which shows the Mean ranks for occupation with respect to domains of CIQ-R.

Table 24: Mean ranks for occupation across different domains of CIQ-R

Occupation	HI		SI		Productivity		ESN		CIQ-Total	
	N	Mean Rank	N	Mean Rank	N	Mean Rank	N	Mean rank	N	Mean Rank
Student	6	16.75	6	42.00	6	77.92	6	59.67	6	49.33
Working	49	50.04	49	54.17	49	62.67	49	60.68	49	60.10
Not working	35	59.44	35	47.94	35	29.66	35	36.61	35	40.67
Retired	10	41.70	10	46.55	10	47.35	10	43.70	10	38.55

Within home integration subscale, students had lower ranks (16.75)when compared to not working individuals who scored mean rank of 59.44.Similarly students had lower integration

(mean rank: 42) in social integration and working population had higher social integration scores (mean rank: 54.17). Higher productivity with high mean rank was observed among students, lower is with respect to individual who are not working, they had lower mean ranking of 29.1 in productivity subscale. In ESN subscale, working age population had higher mean rank (mean rank: 49) compared to not working individuals who had lower mean rank of 36.6. On the whole, individuals who are working had higher /good mean ranks (60.1) compared to retired individuals (Mean rank=38.5) in overall scores of CIQ-R .

Additionally, Mann Whitney U test was carried out to see the within group differences, in turn to see if there was any significant differences observed within occupation.

Table 25 shows that, on student and working, in home integration, there was a statistically significant difference. However same was not found in other domains of CIQ-R. When student and not working individuals were compared, except in CIQ-R total there was a statistically significant value observed among all other domains like HI, Productivity and ESN i.e., $p < 0.01$. When retired individuals and students were compared, home integration and productivity subscales showed significant difference but ESN and CIQ-R total did not show significant difference.

Among working and not working individuals, except for home integration all other domains have shown a significant differences ($p < 0.01$). When working population was compared with retired individuals, statistically significant values are noted only in overall integration and other domains did not show any significant results. Nevertheless, between not working individuals and retired, there were statistically significant results observed in HI, productivity and ESN subscales and not in overall community integration

Table 25: Mann Whitney U test results across various domains of CIQ-R for occupation

Occupation	HI		P		ESN		CIQ-Total	
	Z- Value	p-Value	Z- Value	p-Value	Z- Value	p-Value	Z- Value	p-Value
Student v/s working	2.781	0.05*	1.682	0.93	0.301	0.763	0.974	0.330
Student v/s not working	2.946	0.003**	3.238	0.001**	2.165	0.030*	0.757	0.449
Student v/s retired	2.238	0.025*	2.025	0.043*	1.164	0.263	0.923	0.356
Working v/s not working	1.445	0.148	5.592	0.000**	3.756	0.000**	3.033	0.002**
Working v/s retired	0.679	0.497	1.710	0.087	1.667	0.095	2.033	0.042*
Not working v/s retired	-2.054	0.040*	-1.974	0.048*	-0.706	0.480.*	-0.287	0.774

(p<0.01**,p<0.05*)

The main points to be observed when occupation is taken into consideration is that,

- As one becomes economically self-sufficient by working, their overall integration in home decreased.
- Social integration is more among working population. Retired individuals and those individuals who were not working had similar social integration scores.
- Working population and students performed similar when productivity was concerned. However least productivity was observed to be among those who were not working.
- ESN was often used more by working age population not unlike not- working individuals who does not depend on the technology.
- Overall community integration was good in working population. Retired individual had less community integration.

From the outcomes of the current study it is evident that, occupation plays a major role in integrating a person in their community. Work makes a person less associated to home environment. This might have reduced the overall scores in home integration, because the questions in this subscale are related to amount of time spent in doing work related to household activities, taking care of children, cooking etc.

Further, social integration and productivity is observed to be better among individuals who work (working for salary). This can be attributed to the same fact that, work situation exposes a person to different set of people in their environment. This in turn helps them to maintain good relationship with co-workers and others. Also, working individual would have acquired a skill. This skill makes them more productive in their own way in the society. It is less among those individuals who are retired because, as a person ages, other factors such as mobility problems, physiological problems (Blood pressure, Diabetes, hearing problems etc.) affects how a he/she lives in the community .These health related factors are observed in this study also, among the participants of age 60-70 years.

To use technology even in small gadgets like mobile phones it requires cognitive flexibility to learn a new strategy. This is often observed to be reducing after 50 years of age due to cognitive rigidity or less flexibility. This might limit an older adult in using ESN, hence giving poor scores in ESN subscale. In addition to this, individuals who are not exposed to technology have difficulty to learn from their children, if his son or daughter has learnt using technology from the beginning for their life. Apart from this, older adult needs, expectations and demands are less. All these would have resulted in the decreased ESN integration among not-working and retired

individuals. When overall integration between working age and not working individuals are observed, those who are working have good community integration .This shows that all the aspects of community integration are inter related.

The results of the present study gets support from few of the earlier studies reported in literature. Employment showed a strong and consistent relationship with perceived QOL, social integration within the community, and home and leisure activities (Hibbard M.R et al 1999). Being employed contributes to one's sense of well-being, social integration, and pursuit of leisure and home activities (O'brien 2000).Australian normative on CIQ-R showed that working individuals had higher mean scores in social integration, productivity and overall community integration.

V. Comparison of neuro-typical individuals with respect to number of languages known with all the domains of CIQ-R

Below is the table depicting mean scores of the individuals knowing one or more languages. These mean scores are given with respect to various domains in community integration. In the table, 1-one language known (often Kannada), 2- two languages known (Kannada, English) and 3= three languages known (Kannada, English,Hindi or Telugu)

Home integration

Table 26 reveal that, those who knew one language i.e., Kannada, had higher home integration scores (mean: 6.02) .The performance of those individual who knew two and/or three languages are similar in home integration (mean: 5.8 and 5.3 respectively)

Table 26: Mean, standard deviation and median for language wise with respect various domains of CIQ-R

No of Languages known		HI	SI	Productivity	ESN	CIQTotal
1	N	31	31	31	31	31
	Mean	6.026	5.97	2.23	.87	14.758
	Std. Deviation	2.6630	1.906	1.309	1.544	4.3430
	Median	6.000	6.00	2.00	.00	14.300
2	N	46	46	46	46	46
	Mean	5.885	6.37	3.98	3.09	19.450
	Std. Deviation	2.3025	1.890	1.926	1.998	4.5803
	Median	5.300	7.00	4.00	3.00	19.300
3	N	23	23	23	23	23
	Mean	5.374	7.70	4.13	3.96	21.330
	Std. Deviation	1.7968	1.608	1.766	1.846	4.4697
	Median	5.600	8.00	5.00	4.00	20.600
Total	N	100	100	100	100	100
	Mean	5.811	6.55	3.47	2.60	18.428
	Std. Deviation	2.3103	1.930	1.899	2.184	5.1333
	Median	5.600	7.00	3.00	2.50	18.000

Social integration

In social integration subscale, it can be speculated that, those with three languages had highest mean scores (mean: 7.70) and those with one language had lower scores (mean: 5.97).

Productivity

Individuals with two languages are placed between highest and lowest mean scores i.e., they had a mean score of 6.37 in productivity subscale followed an ascending trend where in higher the number of languages known, higher was the productivity and vice versa. Hence, it is clear from

the graph that, one language known individuals had mean of 2.2, two languages with mean of 3.98 and three with a mean score of 4.13.

ESN

Use of technology and their integration, results were similar to productive subscale. Those who knew three languages had mean score of 3.96. Two languages with mean of 3.07 and one language with least mean score of 0.87.

CIQ-R total

From the table, it was observed that, individuals with three languages known had highest (Mean=21.3) integration in the community. Those with two languages had scored overall mean of 19.4. Individuals who had learnt one language had a least integration in the overall community integration (Mean=14.7). Hence it was clear that, as a person’s language efficiency increases in more than one language his/her overall community integration increases.

In order to see that significance value, non-parametric test i.e., Kruskal willies and Mann Whitney U test was administered. The results of the same are tabulated below along with mean ranks of each of the languages with respect to various parameters of CIQ-R.

Table 27: Kruskal Wallis test results for number languages known across various domains of CIQ-R

	HI	SI	Productivity	ESN	CIQTotal
Chi-Square	.412	11.717	20.039	32.436	26.801
p-value	.814	.003*	.000**	.000**	.000**

P<0.05* and p<0.01**

Results of the significance test indicate that, there is a significance difference in social integration, productivity, ESN and total integration scores. However, statistically significant values were not observed in home integration domain.

Table 28: Mean ranks for number of languages across different domains.

HI			SI		Productivity		ESN		CIQ-Total	
Language	N	Mean Rank	N	Mean Rank	N	Mean Rank	N	Mean rank	N	Mean Rank
One language	31	51.82	31	41.79	31	31.58	31	27.08	31	29.24
Two languages	46	51.29	46	47.71	46	57.62	46	57.50	46	56.04
Three languages	23	47.13	23	67.83	23	61.76	23	68.07	23	68.07

From the above table, it can be speculated that, those who learnt one language and two languages had similar higher mean ranks (mean rank: 51.2) compared to those with more than two languages who had lower ranking in home integration (mean rank; 47.1). In social integration, individuals with three languages had higher mean ranks (mean rank: 67.8) compared to the group who had learnt only one language (mean rank; 41.7). Those with three languages had higher mean ranking in both productivity subscale (mean rank: 61) and in ESN (mean rank: 68.0). This increases in trend continued even for overall community integration scores (mean rank: 68.0)

Mann Whitney U test revealed that, between one and two languages when compared, the significant difference is noted with respect to productivity, ESN and total scores.

Table 29: Comparison of languages with respect to different domains of CIQ-R

Language	SI		P		ESN		CIQ-Total	
	Z- Value	P-Value	Z- Value	P-Value	Z- Value	P-Value	Z- Value	P-Value
1v/s 2	0.857	0.391	4.004	0.000**	4.856	0.000**	4.158	0.000**
1 v/s 3	3.203	0.001**	3.689	0.000**	4.821	0.000**	4.437	0.000**
2 v/s 3	2.543	0.11	0.774	0.439	1.535	0.125	1.733	0.083*

P<0.05*, p<0.01**

Between one and three, there was a statistically significant values in social integration, ESN, productivity and also in total CIQ-R scores. When two and three languages were compared, significant values was observed only with respect to total scores and not in social integration, productivity, and in ESN.

In short, the effect of number of languages known to a person and its effect on community integration is as follows:

- Home integration decreased as number of languages known increased.
- Social integration, productivity, ESN all increased as one learns more languages.
- Overall community integration is higher for person when he or she knew more than one language.

As person acquires more languages, his cognitive capabilities and cognitive flexibility improves. This improvement with respect to cognition helps the individuals to socially interact with more people, and be an active member in the community. Individuals who participated in the present study were either monolingual (Kannada), bilingual (Kannada, English)and, those who knew three languages (Kannada, English combined with either Telugu and/or Tamil). Most of the participants had learnt these languages in the early age itself or had learnt to speak due to their

job requirements. However, the proficiency in the known languages to the individuals has not been considered in the study. Learning new languages removes language barriers. This might have impacted on the scores in social integration subscale. To add on, India is a multicultural and multilingual country. A person who knows more than one language is always on advantage when compared to the ones who know only their regional languages. Hence, knowing more number of languages helps an individual to connect to more people socially. This adds on to the increase in scores of social integration subscale.

Improvement in cognitive processes also helps a person to be more empowered to use technology irrespective of younger or older age. Cognitive flexibility impacts on the overall personality of the individual. It also enhances the overall productivity in their job environment. This is because of the fact that, multilingual individual can connect to more people. This increases his status in the work environment due to more exposure. This in turn improves the overall community integration. Thus based on these results, if a person knows more than one language being proficient in that language to speak with others, it improves their overall community integration.

A study done on bilingualism by Mohanty (2014) in Oriya speaking children shows that, the bilinguals significantly outperformed the monolinguals in intelligence and cognitive information processing types of task, including simultaneous and successive coding processes. The study showed in which ways bilingualism can lead to an enriched, more differentiated, and creative world view (which has a positive impact on cognitive development) in a society where social norms, including choice and use of languages

Mohanty (1987) in a study on advantages of learning languages showed that, 'the ability to think about and reflect upon the nature and functions of language' is an important variable mediating the positive effects of bilingualism on cognitive and linguistic growth". Several of the later studies included educational and sociological variables which enabled Mohanty(1987) to draw important conclusions in relation to how minority education should be organized to achieve positive cognitive, linguistic, and academic goals and to lead to better social integration of minorities.

The results obtained add on to the existing literature that, bilingualism or multilingualism has more advantages over monolinguals. However, the results of this subsection needs to be cautiously generalized because of other confounding variables.

VI. Comparison of overall scores of neuro-typical individuals with brain damaged individuals(persons with aphasia)

The table below has two groups. One is of neuro- typical with N: 100.Second is of aphasics with N=10. The total mean, standard deviation and median scores are compared across all the domains of CIQ-R

In all the domains it was clear that, neuro -typical had upper hand compared to aphasics.

In each domain group1 had a mean score of5.81 in home integration and aphasics had a score of 2.63.

Within social integration aphasics had mean score of 3.66 and neuro- typical have 3.60 mean. Similarly in productivity, neuro-typical individuals productivity is 3.47 mean and that for aphasics is 1.30.

Table 30: Mean standard deviation, Median of neuro-typical individuals and aphasic group.

Group		HI	SI	Productivity	ESN	CIQTotal
1	N	100	100	100	100	100
	Mean	5.811	6.55	3.47	2.60	18.428
	Std. Deviation	2.3103	1.930	1.899	2.184	5.1333
	Median	5.600	7.00	3.00	2.50	18.000
2	N	10	10	10	10	10
	Mean	2.630	3.60	1.30	.70	8.130
	Std. Deviation	2.4386	3.438	1.059	1.337	6.8404
	Median	1.650	2.50	1.50	.00	6.150
	Median	5.000	7.00	3.00	2.00	17.800

PWA had mean score of 1.30 in ESN when compared to neuro-typical individuals who have score of 2.60 in ESN subscale.

On the whole, neuro-typical individuals had mean score of 18.42 out of 35 and aphasics have mean score of 8.13 out of 35 for total community integration. It is clear that, in almost all domains aphasics have scored half of the scores of neuro-typical individuals.

Table 31 below represents the mean, standard deviation and median for different types of aphasia considered in the study with respect to different domains of CIQ-R.

A total of ten persons with aphasia participated in the study. Among which, four were individual with Broca's aphasia. Two with conduction and anomic aphasia were included along with one Wernicke's aphasia and one global aphasia

Home integration

From the table it is clear that, individuals with conduction aphasia have highest mean (Mean: 3.65) and Wernicke's aphasics and global aphasics have lowest mean scores (Mean=1.0). Conduction aphasics are followed by Broca's and anomic aphasia with a mean of 3.0 and 2.5 respectively.

Social integration

In social integration domain, individuals with Broca's aphasia had higher mean scores (mean: 4.50) compared to all other types. Broca's aphasics were followed by anomic (mean: 3.50) and conduction aphasics (mean: 2.50) Wernicke's aphasics and global aphasics have least mean score (mean: 0).

Productivity

Both Broca's aphasia and anomic aphasics have similar mean score i.e mean=1.50. Highest productivity is observed in conduction aphasics with a mean score of 2.00. Also global and Wernicke's aphasics have similar lowest scores (Mean=1.00)

ESN

Similarly, Broca's aphasics have highest integration in using technology (mean: 1.25). This is followed by anomic aphasia who have scored a mean of 1.00. All other types have aphasics have similar mean scores of 0.00.

Table 31: Represents the mean, SD and median for each domain across various types of aphasia.

Type		HI	SI	Productivity	ESN	CIQTotal
Conduction	N	2	2	2	2	2
	Mean	3.650	2.50	2.00	.00	8.150
	Std. Deviation	3.3234	.707	.000	.000	4.0305
	Median	3.650	2.50	2.00	.00	8.150
Broca's	N	4	4	4	4	4
	Mean	3.000	4.50	1.50	1.25	10.000
	Std. Deviation	2.7080	4.796	1.291	1.893	9.2014
	Median	2.000	4.00	1.50	.50	9.000
Anomic	N	2	2	2	2	2
	Mean	2.500	3.50	1.50	1.00	8.500
	Std. Deviation	3.5355	3.536	.707	1.414	9.1924
	Median	2.500	3.50	1.50	1.00	8.500
Global	N	1	1	1	1	1
	Mean	1.000	1.30	.00	.00	1.000
	Std. Deviation	.	.	.	.	.
	Median	1.000	1.30	.00	.00	1.000
Wernicke	N	1	1	1	1	1
	Mean	1.000	.00	.00	.00	1.000
	Std. Deviation	.	.	.	.	.
	Median	1.000	.00	.00	.00	1.000

Total CIQ-R

From the table it is clear that the overall integration is higher in Broca's aphasics (mean: 10.0), and followed by anomic (mean: 8.5) and conduction (mean: 8.15). Both Wernicke's and global aphasics have lowest community integration (mean: 1.00).

Further, Kruskal Wallis test was carried out in order to check the mean ranks within the types of aphasia with respect to each of the domains in CIQ-R. The results of the same are tabulated as below.

The table below represents mean ranks for all the types of aphasics considered in the study with respect to their home integration, productivity, social integration, ESN and total community integration scores. Among them, conduction have higher rank (mean rank: 7.0) and Wernicke's aphasics (mean rank: 3.00) have lower ranking in home integration.

When social integration was considered, Broca's aphasics had higher mean ranking (mean rank: 6.0) compared to others. In this also, Wernicke's (mean rank: 1.50) and Global aphasics (mean rank: 1.50) had lower mean ranks.

Conduction aphasics outperformed with respect to productivity. They had highest mean rank of 7.50. Even in this subscale, person with Wernicke's aphasia and Global aphasia had lower mean ranks (mean rank: 3.00)

Higher integration with respect to ESN was observed in both Broca's aphasia individuals and Anomic aphasia individual. Both had a mean rank of 6.50. They were followed by Conduction aphasics with lower mean rank of 4.00

In CIQ-R total, person with Wernicke's aphasia had least ranking and person with Anomic aphasia and those with Conduction aphasia had higher mean ranks (mean rank: 6.00).

Table 32: Mean ranks for different types of aphasics for each domain of CIQ-R

	Type	N	Mean Rank
HI	Conduction	2	7.00
	Broca's	4	6.50
	Anomic	2	4.50
	Global	1	3.00
	wernike	1	3.00
	Total	10	
SI	Conduction	2	5.50
	Broca's	4	6.00
	Anomic	2	5.50
	Global	1	1.50
	Wernike	1	1.50
	Total	10	
Productivity	Conduction	2	7.50
	Broca's	4	6.00
	Anomic	2	6.00
	Global	1	2.00
	Wernicke	1	2.00
	Total	10	
ESN	Conduction	2	4.00
	Broca's	4	6.50
	Anomic	2	6.50
	Global	1	3.00
	Wernicke	1	4.00
	Total	10	
CIQTotal	Conduction	2	6.00
	Broca's	4	5.88
	Anomic	2	6.00
	Global	1	3.00
	Wernicke	1	1.50

Table 33:Kruskal Wallis test results for significance between groups

	HI	SI	Productivity	ESN	CIQTotal
Mann-Whitney U	181.000	233.000	172.500	245.000	126.500
Wilcoxon W	236.000	288.000	227.500	300.000	181.500
Z	3.328	2.806	3.459	2.710	3.886
p-value	.001**	.005**	.001**	.007**	.000**

(*p<0.05,**p<0.01)

From the table above it is evident that, there was a significant difference between two groups' i.e., group1 neuro-typical individuals and group 2 PWA. There was a significant difference between them in all subgroups of CIQ-R.(p<0.01)

To summarize,

- PWA had significantly lower community integration when compared to neuro-typical individuals with respect to all the domains of CIQ-R.

PWA considered in the study, included both fluent and non-fluent persons with aphasia. The above attributions can be intended mainly to the brain damage in PWA .Irrespective to the severity, aphasia affects the person's comprehension and expression of language. CIQ-R examines the person's overall integration with respect to home environment, social setting, productivity and ESN. The decrease in language ability itself poses a barrier in the individual to communicate with their partners during communication. Thus, the involvement of the PWA with the family members, friends, and relatives and in work setting diminishes. This might have affected the overall reduction in the community integration for PWA. In CIQ-R, home integration per se includes questions related to decision making tasks, helping family members in

shopping etc. When a person cannot understand what is happening in the environment, he or she may not be a good communicator in that situation.

Often there is change in the role of the person after stroke. The person's ability to interact and integrate with the family members decreases drastically due to the very same reason.

In 1920s, a concept of social role was developed by Margaret Mead, Talcott Parsons and others. They spot each individual in the perspective of sociology and social psychology. Most of the activities of daily living and other everyday activities are considered to be the acting out of socially defined categories. According to this theory, each role has a set of rules and roles to be followed when one is living in the community. Hence, each role has its own duties, a set of expectations, norms and behavior to be fulfilled by the individual.

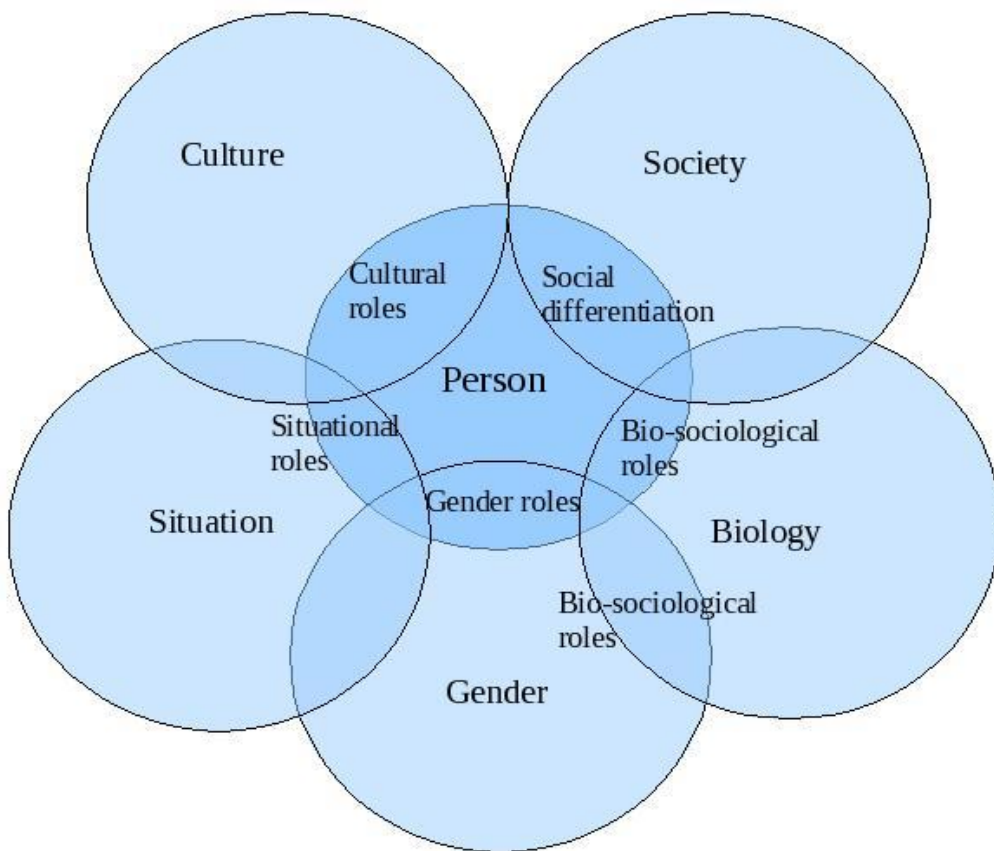


Fig: 1 Social role and their types. [Source: www.psychology.net]

From the above figure, it is clear that, when a person is living in a community he/she is bound to be given with one or the other roles .According to the role theory, a person has a cultural role (roles given by culture), asocial differentiation role (role based on the profession of the person), situation specific role, bio sociological role and gender role (based on gender).Also it is clearly depicted that, all the roles overlap on each other. This play an important role in how a person behaves and integrates in the community and in the society at large.

Even though CIQ-R is not designed based on the role theory, it helps in deducing some of the conclusions that this study gives.

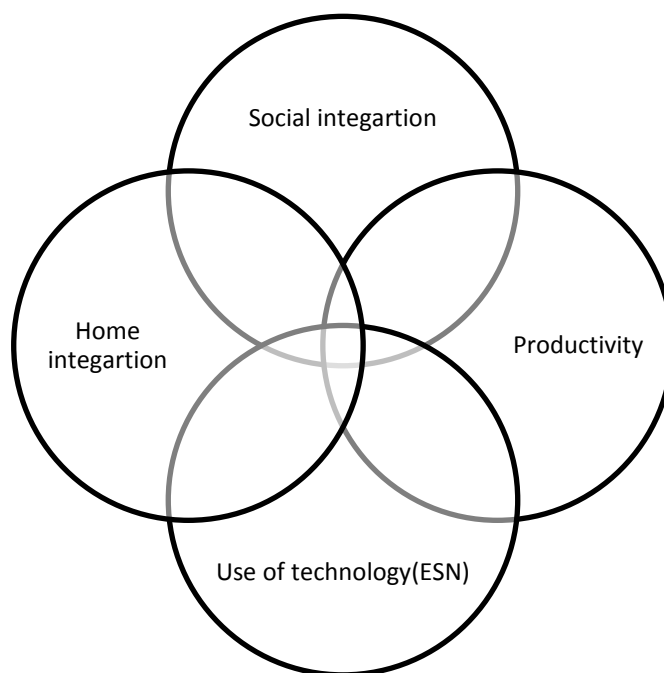


Fig 2: Interaction of components of community integration.

From the definition of community integration it is clear that, it is the experience of being part of the community. Based on role theory, community gives each individual a role to play. If a person has to play a role he /she should be able to participate in it. To participate, their skills become important (cognitive skills, language skills etc.). From this study it is clear that, as age increases a person's ability increases. Ability with respect to improved cognition, improved motor abilities etc. This change in ability gives different set of responsibilities in the person. Roles and responsibility change accordingly in the community. From the result it is understood that at different age, stage of life brings a change of role in the person. This change demands difference in the performance of the individual. Hence, at younger age a person's role might be being a student (20-30years). So he/she can integrate in home environment more because he/she is not economically self-sufficient. In later stage of life his/her role changes from being a student to working men/women. This increases their social integration and productivity. So it is clear from the results that, community integration varies throughout the life span. At one point of time, person may be integrated more at home when compared to any other domain and it changes as one's priority changes in life. Once, the person may expand from one area of integration into another; for example, they may return to work, which will increase the productivity subscale, but then participate less in home activities, thus decreasing the home subscale. Change in 'roles' bring change in the community integration. Similarly, when PWA is considered, their change in 'roles', has affected more in the overall community integration results.

To conclude, CIQ-R has proven to be a reliable tool to measure community integration. Domains of this questionnaire are more relevant for persons with aphasia. It is shown its usefulness in PWA in this study. The areas of participation where participation is restricted can

be taken as intervention goals. This can also help in planning the intervention goals which are more relevant for persons with aphasia. This improves the overall quality of life of the individual.

CHAPTER V

Summary and conclusion

The present study was intended to adapt Community Integration Questionnaire –Revised (CIQ-R) given by Winkler et al (1997) to Indian population in Karnataka region. It was done with an aim of investigating the baseline of integration in neuro-typical individuals and also to validate it on neurologically damaged individuals i.e. person with aphasia (PWA).The review of literature revealed that, CIQ has been extensively utilized for many disorders such as spinal cord injury patients, TBI patients etc.CIQ has been revised by adding a new domain into the questionnaire called ESN (Electronic social networking).

The concept community integration can be considered equivalent to, or even interchangeable, with the concept ‘participation’ in the ICF (WHO 2001; Kim, Colantonio, Dawson & Bayley 2013).It has been considered as one of the important aspect of Rehabilitation in the recent times.

The basis to adapt CIQ-R to Indian context and making it language free tool was that, the extent of impairment in community integration is not well researched area in the field of speech language pathology. Most of the assessment stops at the level of linguistic competence itself. However, a person will have difficulty in the area of participation also. Hence, it is important to look and analyze an individual beyond their linguistic ability and measure their quality of life. Thus, this study was taken up to study and delineate the differences in community integration between neuro-typical individuals and PWA.

Revised Community integration questionnaire (CIQ-R) contains 18 questions broadly divided into four domains. They are as follows-

- a. **Home Integration:** Active participation in home or household activities. The questions focus on child care, meal preparation, shopping for groceries etc.
- b. **Social Integration:** It is the ability to participate in activities outside the home environment. Questions encompass from paying bills to frequency of leisure activities and social relationships.
- c. **Productivity:** It is the ability to contribute positively to the community and society in large. This assesses person's volunteering activities, frequency of travel outside home, ongoing formal education and employment.
- d. **Electronic social networking:** It is the ability to use technology enabled interactions

A total of 100 neuro-typical individuals (10 males and 10 females in each of the age groups) of age range 20-30 years, 30-40 years, 40-50 years, 50-60 years, and 60-70 years were considered as participants for the study. Ten individuals with aphasia were also included in the study. The study aimed at investigating the performance of neuro-typical individuals both males and females in various domains of CIQ-R and also, on comparing the performance of PWA in various domains.

The data obtained were tabulated and subjected to statistical analysis using SPSS software (version 17.0). Mean, standard deviation, median and confidence interval were calculated separately for both neuro-typical individuals and for individuals with aphasia. Further to explore the significance of the difference in performance, Kruskal -Wallis and Mann Whitney U test was carried out for both groups.

The findings of the study can be summarized as:

(i) Age and its effects on community integration

- There was, increase in home integration from younger age till adulthood.
- As age increased social integration also increased till 40-50 years, after which there was decrease in social integration in older adult population.
- There was a steady decline in the productivity subscale from 20 years till 60 years of age. Later, from 60-70 years, increase in productivity is noted.
- ESN subscale followed similar results as that of productivity subscale wherein, younger individuals have higher ESN integration. It decreases till 60 years of age and slight increase in scores among older adults.
- Adults between 30-40 years had highest community integration compared to any age group. There was decrease in overall community integration in older adult population. However, integration of 60-70 years was better when compared to that of 50-60 years.
- 30-40 years age population had highest integration in all domains compared to other age groups.

(ii) Effects of gender on community integration

- Females had higher home integration compared to males in all the groups.
- Males had higher social integration as age increased, whereas females maintained a constant level in social integration.
- Productivity decreased in females as age increased. Males had highest productivity when age increased.

- Females had less integration in ESN throughout the age groups. But males had good ESN integration in younger age which decreased as age increased.
- In over all community integration scores, males had higher community integration compared to females irrespective of their age.

(iii) Effect of education on community integration

- As education level increased, social integration, ESN, productivity and overall community integration increased.
- As there was increase in education level, the home integration reduced

(iv) Effects of occupation on community integration

- As one becomes economically self-sufficient by working, their overall integration in home decreased.
- Social integration is more among working population. Retired individuals and those individuals who were not working had similar social integration scores.
- Working population and students performed similar when productivity was concerned. However least productivity was observed to be among those who were not working.
- ESN was often used more by working age population not unlike not- working individuals who does not depend on the technology.
- Overall community integration was good in working population. Retired individual had less community integration.

(v) Effects of number languages known on community integration

- Home integration decreased as number of languages known increased.
- Social integration, productivity, ESN all increased as one learned more languages.
- Overall community integration was higher for person when he or she knew more than one language.
- PWA have significantly lower community integration when compared to neuro-typical individuals with respect to all the domains of CIQ-R

Implications of the study

- The normative data provides information about home, social, productivity, ESN and overall community integration of a neuro-typical population in India, in Karnataka region.
- Normative data represents the performance in different areas of community integration varies throughout the life span. At one point in time the person may expand from one area of integration into another; for example, they may return to work, which will increase the productivity subscale, but then participate less in home activities, thus decreasing the home subscale.
- The results provide insights to the aspects of community integration that are relevant to and valued by people of different gender, age, socio-economic and educational backgrounds.
- In the study, comparison between PWA and neuro-typical individuals has shown that, there was a significant reduction in their integration after neurological insult. This calls for the need for assessing the level of community integration during intervention.

- By comparing the scores, clinicians should take up goals in such a way that it improves the person's integration with respect to home and social environments, their productivity and communication using technology. This in turn improves the overall community integration

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APPENDIX I

ALL INDIA INSTITUTE OF SPEECH AND HEARING, MYSORE

Consent letter for Research paper

Title: Adaptation and Validation of Community Integration Questionnaire –Revised (CIQ-R) to Indian Population

Participant Information

Participant's Name:

Age/ Gender:

Native Language:

Informed consent

I have been informed about the aims, objectives and the procedures of the study. I understand that I have a right to refuse to participate. I have had the opportunity to ask questions about it and any questions that I have asked have been answered to my satisfaction. I consent voluntarily to participate/for my ward to participate in this study.

I, _____ the undersigned, give my consent /on behalf of my ward to be a participant of this investigation.

Signature of the Caregiver/Spouse

(Name and Address)

Signature of the Investigator:

Name and Designation:

Date:

Description of the study: The study aims to develop a normative for detecting the level of integration of the person at home environment, social situations, productivity etc. It can be further incorporated for persons with aphasia by comparing the normative data obtained. Also it helps in choosing appropriate therapy goals for individuals with aphasia.

APPENDIX- II

The Community Integration Questionnaire-Revised (CIQ-R)

Name:

Date:

1. **Who usually does the shopping for groceries or other necessities in your household?**

- Yourself alone Yourself and someone else Someone else.

2. **Who usually prepares meals in your household?**

- Yourself alone Yourself and someone else Someone else.

3. **In your home who usually does normal everyday housework?**

- Yourself alone Yourself and someone else Someone else.

4. **Who usually cares for the children in your home?**

- Yourself alone Yourself and someone else Someone else.

Not applicable (no children under 17 yrs at home)

5. **Who usually plans social arrangements such as get-togethers with family and friends?**

- Yourself alone Yourself and someone else Someone else.

6. **Who usually looks after your personal finances, such as banking or paying bills?**

- Yourself alone Yourself and someone else Someone else.

7. **Approximately how many times a month do you usually participate in shopping outside?**

- 5 or more 1-4 times Never

8. **Approximately how many times a month do you usually participate in leisure activities such as movies, sports, restaurants, etc?**

- 5 or more 1-4 times Never

9. **Approximately how many times a month do you usually visit friends or relatives?**

- 5 or more 1-4 times Never.

10. When you participate in leisure activities do you usually do this alone or with others?

- Mostly alone Mostly with family members Mostly with friends.
 With a combination of family and friends.

11. Do you have a best friend in whom you trust?

- Yes No

12. How often do you go outside the home?

- Almost every day Almost every week never (less than once per week)

13. Please check the answer that best corresponds to your current (during the past month)work situation:

- Full-time (more than 20 hours per week)
 Part-time (less than or equal to 20 hours per week)
 Not working, but actively looking for work
 Not working, not looking for work
 Not applicable, retired due to age.

14. Please check the answer that best corresponds to your current (during the past month) school or training program situation:

- Full-time
 Part-time
 Not attending school or training program
 Not applicable, retired due to age

15. In the past month, how often did you engage in volunteer activities?(Ex-Activity support: art/craft, being a Committee member etc)

- 5 or more 1-4 times Never

16. How often do you write to people for social contact using the Internet (e.g., email, social networking sites such as Facebook)?

- Every day / most days Almost every week Never

17. How often do you talk to people for social contact using an online video link (e.g. Skype, FaceTime, Video call)?

- Every day / most days Almost every week Never

18. How often do you make social contact with people by talking or text messaging using phone?(Ex-WhatsApp, Hike, etc)

- Every day / most days Almost every week Never

APPENDIX-III
(Scoring for each domain)

Home Integration Subscale

- | | | |
|-----------|---|---|
| 1. | Who usually does the shopping for groceries or other necessities in your household? | |
| | Yourself alone | 2 |
| | Yourself and someone else | 1 |
| | Someone else | 0 |
| 2. | Who usually prepares meals in your household? | |
| | Yourself alone | 2 |
| | Yourself and someone else | 1 |
| | Someone else | 0 |
| 3. | In your home who usually does the normal everyday housework? | |
| | Yourself alone | 2 |
| | Yourself and someone else | 1 |
| | Someone else | 0 |
| 4. | Who usually cares for the children in your home? | |
| | Yourself alone | 2 |
| | Yourself and someone else | 1 |
| | Someone else | 0 |

*Not applicable / no children under 17 yrs in home Score as average of Items 1, 2, 3 & 5

- | | | |
|-----------|--|---|
| 5. | Who usually plans social arrangements such as get-togethers with family and friends? | |
| | Yourself alone | 2 |
| | Yourself and someone else | 1 |
| | Someone else | 0 |
| 6. | Who usually looks after your personal finances, such as banking and paying bills? | |
| | Yourself alone | 2 |
| | Yourself and someone else | 1 |
| | Someone else | 0 |

Home Integration Score = Sum of Items 1, 2, 3, 4, 5, 6

Potential score range = 0-12

Social Integration Subscale

1. Approximately how many times a month do you usually participate in shopping outside yourhome?

5 or more	2
1-4 times	1
Seldom / never	0

2. Approximately how many times a month do you usually participate in leisure activities such as movies, sports, restaurants, etc?

5 or more	2
1-4 times	1
Seldom / never	0

3. Approximately how many times a month do you usually visit your friends and relatives?

5 or more	2
1-4 times	1
Seldom / never	0

4. When you participate in leisure activities do you usually do this alone or with others?

Mostly alone	0
Mostly with family members	1
Mostly with friends who have a disability	1
Mostly with friends who do not have a disability	2
With a combination of family and friends	2

5. Do you have a best friend in whom you confide?

Yes	2
No	0

Social Integration Score = Sum of Items 7, 8, 9, 10, And 11

Potential score range = 0-10

Productivity Subscale

6. How often do you travel outside the home?
- | | |
|--|---|
| Almost every day | 2 |
| Almost every week | 1 |
| Seldom / never (less than once per week) | 0 |
7. Please check the answer below that best corresponds to your current (during the past month)work situation:
- Full-time (more than 20 hours per week)
 - Part-time (less than or equal to 20 hours per week)
 - Not working, but actively looking for work
 - Not working, not looking for work
 - Not applicable, retired due to age
8. Please check the answer below that best corresponds to your current (during the past month)school or training program situation:
- Full-time
 - Part-time
 - Not attending school or training program
 - Not applicable, retired due to age
9. In the past month, how often did you engage in volunteer activities?
- 5 or more
 - 1-4 times
 - Never

JOBSCHOOL Variable Scoring = (Items 13 to 15)

These items, although collected individually, will be combined to form one variable;

Jobschool.	Jobschool Score
Works full-time AND attends school part-time OR attends school full-time AND works part-time (less than 20 hours per week)	5
Attends school full-time OR works full-time	4
Attends school part-time OR working part-time (less than 20 hours per week)	3
Actively looking for work AND / OR volunteers 5 or more times per month	2
Volunteers 1 to 4 times per month AND not working, not looking for work, not in school	1
Not working, not looking for work, not going to school, no volunteer activities	0

*If retired due to age, the Jobschool variable is based on Item 15 (Volunteer activities) only.

In the past month, how often did you engage in volunteer activities?

5 or more	4
1-4 times	2
Never	0

Productivity Score = Sum of Item 12 and Jobschool variable score

Potential score range = 0-7

Electronic Social Networking Subscale

10. How often do you write to people for social contact using the Internet (e.g. email, social networking sites)?

Every day or most days	2
Almost every week	1
Seldom / never	0

11. How often do you talk to people for social contact using an online video link (e.g. Skype, Face-time)?

Every day or most days	2
Almost every week	1
Seldom / never	0

12. How often do you make social contact with people by talking or text messaging using your phone?

Every day or most days	2
Almost every week	1
Seldom / never	0

Electronic Social Networking Score = Sum of Items 16, 17, and 18

Potential score range = 0-6

APPENDIX IV

Normative data from the present study

Home integration

Mean, median, standard deviation (SD) and 95% Confidence interval for mean across different age groups with respect to gender for Home Integration subscale

Age groups	Gender	N	Mean	Standard deviation (SD)	Median	95% Confidence Interval for mean	
						Minimum	Maximum
Group 1	Male	10	4.78	1.80	3.80	3.49	6.06
	Female	10	3.48	2.14	3.80	1.94	5.01
Group 2	Male	10	6.63	1.58	6.50	5.4	7.7
	Female	10	7.70	1.70	2.22	6.4	8.9
Group 3	Male	10	5.30	2.45	4.65	3.6	7.1
	Female	10	7.50	2.71	6.50	5.5	9.4
Group 4	Male	10	5.39	2.18	5.00	3.8	6.9
	Female	10	6.10	2.30	6.00	4.4	7.7
Group 5	Male	10	5.02	0.91	4.60	4.3	5.6
	Female	10	6.14	2.16	5.15	4.5	7.6

Social integration

Mean, median, standard deviation (SD) and 95% confidence interval for mean across different age groups with respect to gender for Social Integration subscale.

Age groups	Gender	N	Mean	Standard deviation (SD)	Median	95% Confidence Interval for mean	
Group 1	Male	10	6.10	1.79	6.50	4.82	7.38
	Female	10	6.70	1.49	7.0	5.63	7.77
Group 2	Male	10	7.70	1.76	8.00	6.4	8.9
	Female	10	6.40	2.22	7.00	4.8	7.9
Group 3	Male	10	7.80	1.75	7.50	6.5	9.0
	Female	10	6.70	2.00	7.00	5.2	8.1
Group 4	Male	10	5.20	1.98	5.00	3.7	6.6
	Female	10	6.70	1.49	7.00	5.6	7.7
Group 5	Male	10	6.30	2.11	6.50	4.7	7.8
	Female	10	5.90	1.91	5.50	4.5	7.2

Productivity:

Mean, median, standard deviation (SD) and 95% Confidence interval for mean across different age groups with respect to gender for productivity subscale.

Age groups	Gender	N	Mean	Standard deviation (SD)	Median	95% Confidence Interval for mean	
Group 1	Male	10	5.30	1.76	5.00	4.82	7.38
	Female	10	4.60	2.63	4.50	2.42	6.48
Group 2	Male	10	4.80	1.31	5.00	3.8	5.7
	Female	10	3.30	1.88	3.00	1.9	4.6
Group 3	Male	10	3.90	0.99	4.00	3.1	4.6
	Female	10	1.70	1.05	1.50	0.9	2.4
Group 4	Male	10	3.40	1.71	4.00	2.1	4.6
	Female	10	1.70	1.16	2.00	0.8	2.5
Group 5	Male	10	3.40	1.50	3.00	2.3	4.4
	Female	10	2.60	0.66	2.50	2.1	3.1

Electronic social networking

Mean, median, standard deviation (SD) and 95% Confidence interval for mean across different age groups with respect to gender for ESN subscale.

Age groups	Gender	N	Mean	Standard deviation (SD)	Median	95% Confidence Interval for mean	
Group 1	Male	10	4.30	1.73	4.00	3.08	5.52
	Female	10	1.90	1.59	2.00	0.76	3.74
Group 2	Male	10	4.30	1.41	4.50	3.2	5.3
	Female	10	3.50	2.67	4.00	1.5	5.4
Group 3	Male	10	3.80	1.98	4.00	2.3	5.2
	Female	10	1.80	2.44	0.50	0.05	3.5
Group 4	Male	10	1.60	1.35	1.00	0.6	2.5
	Female	10	0.80	1.39	0.10	0.20	1.8
Group 5	Male	10	2.10	2.07	1.50	0.6	3.5
	Female	10	1.90	2.02	2.00	0.45	3.3

CIQ total

Mean, median, standard deviation (SD) and 95% Confidence interval for mean across different age groups with respect to gender for CIQ-R total.

Age groups	Gender	N	Mean	Standard deviation (SD)	Median	95% Confidence Interval for mean	
Group 1	Male	10	20.48	4.39	20.45	17.33	23.60
	Female	10	16.68	4.62	16.15	13.37	19.38
Group 2	Male	10	23.83	2.76	25.00	21.8	25.8
	Female	10	20.90	6.11	23.00	16.5	25.2
Group 3	Male	10	20.86	4.20	21.00	17.8	23.8
	Female	10	17.70	4.62	16.50	14.3	21.0
Group 4	Male	10	14.86	3.16	15.50	12.5	17.1
	Female	10	15.31	3.79	15.80	12.5	18.0
Group 5	Male	10	16.62	4.99	15.80	13.0	20.1
	Female	10	17.04	5.51	16.65	13.0	20.9