

**Adaptation and Validation of Revised Craig Handicap Assessment and
Reporting Technique (CHART) in Kannada**

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**This Dissertation is submitted as part fulfillment
For the Degree of Master of Science in (Speech-Language Pathology)
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**ALL INDIA INSTITUTE OF SPEECH AND HEARING
MANASAGANGOTHRI,
MYSORE-570006**

April 2018



Certificate

This is to certify that this dissertation entitled “**Adaptation and validation of Revised Craig Handicap Assessment and Reporting Technique (CHART) in Kannada**” is a bonafide work in part fulfillment for the degree of Master of Science (Speech-Language Pathology) of the student (Registration No. 16SLP004). 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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Declaration

This dissertation entitled “**Adaptation and validation of Revised Craig Handicap Assessment and Reporting Technique (CHART) in Kannada**” 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.

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CHAPTER I

INTRODUCTION

Aphasia can be defined as the loss or impairment of language caused by brain damage (Benson & Ardila, 1996). It is an acquired impairment in language production, comprehension and in other cognitive processes that underlie language (Chapey 1994). Aphasia has significant effect on language skills of a person, which is intricate, and multidimensional (Simmons-Mackie, Threats, & Kagan, 2005).

Persons with aphasia exhibit problems in different areas (language, behavioral and physical) which leads to restrictions in social involvement. Consequences of difficulty in communication can impinge on their participation in society and may lead to social isolation, mental and emotional changes (behavioral problems like depression, apathy), problems in adjustments of interpersonal relations, lack of independence and failure to return to their workplace (Cruice, Worrall, Hickson, & Murison, 2003; Hemsley & Code, 1996; Ross & Wertz, 2003; Worrall & Holland, 2003).

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; Le Dorze, Julian, Brassard, Durocher, & Boivin, 1994; Lomas, Pickard, & Mohide, 1987). Following are few aspects which are noteworthy and need 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, Wiggins, Byng, & Smith, 2003; Smith, 1985; Wade, Hewer, David, & Enderby, 1986).

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 (Smith, 1985).

Persons with stroke and TBI exhibit other associated like difficulty in social integration, economic status, mobility etc. these associated problems can lead to handicap in individual's life. World Health Organization (WHO), in 2001 has given few explanations to differentiate handicap, disability and impairment.

According to the World Health Organization (WHO), a **handicap** exists when individuals with impairment or disability are unable to fulfill one or more of the roles that are considered normal for their age, gender, and culture. "In the context of health experience, a **disability** is any restriction or lack (resulting from an impairment) of ability to perform an activity in the manner or within the range considered normal for a human being"- (WHO Geneva 1980). "In the context of health experience, an **impairment** is

any loss or abnormality of psychological, physiological, or anatomical structure or function”- (WHO Geneva 1980)

The model of disablement suggested by the World Health Organization (WHO) has provided useful conceptual distinctions for impairment, disability, and handicap. The WHO has identified six dimensions by which the extent of a person’s handicap can be described:

- Physical independence is an ability to sustain a customary effective independent existence.
- Cognitive independence refers to an ability of an individual to maintain independence without any supervision.
- Mobility is nothing but, to move around the one’s surrounding.
- Occupation is an ability to occupy one’s time in the manner customary to a person’s sex, age, and culture.
- Social integration refers to an ability to participate in and maintain customary social relationships.
- Economic self-sufficiency is to sustain customary socio-economic activity and independence

The Craig Handicap Assessment and Reporting Technique (CHART) was developed [Whiteneck, Mellick, Walker, Brooks, Gerhart, (1992) revised in the year 1995] to assess the WHO dimensions of handicap (physical independence, cognitive independence, mobility, occupation, social integration and economic self-efficiency). The instrument was designed to provide a simple, objective measure of the degree to

which impairments and disabilities result in handicaps in the years after initial rehabilitation.

CHART is used to assess the handicap level in persons with spinal cord injury (SCI), traumatic brain injury (TBI), Stroke (Segal, Richard, Schall, 1995), Multiple Sclerosis, Burn and Amputees. Various studies have been conducted on individuals with SCI, stroke and TBI using CHART to check the level of handicap in them but no study has been done on neuro-typical individuals to develop a normative for CHART in Indian context.

NEED FOR STUDY:

The present study focuses on activity and participation of persons with traumatic brain injury in activities of daily living under the six dimensions which are identified in WHO ICIDH 1980. CHART assesses the level of handicap in persons with traumatic brain injury under six dimensions (Orientation, physical independence, mobility, occupation, social integration and economic self-efficiency). Many checklist and instruments measures the linguistic deficit in persons with aphasia, but very few questionnaires are available in different languages, which assess the persons with aphasia as a whole including orientation, physical independence, mobility, occupation, social integration and economic self-efficiency. But, in Indian context there are limited numbers of studies to check the level of handicap in individuals with aphasia.

AIM:

The aim of the present study is to adapt and validate the Revised Craig Handicap Assessment and Reporting Technique (CHART) in Kannada.

OBJECTIVES:

- To adapt the Revised Craig Handicap Assessment and Reporting Technique (CHART) to Kannada language.
- To determine the performance of neuro-typical individuals on CHART-K
- To validate Revised Craig Handicap Assessment and Reporting Technique (CHART) in Kannada language.

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CHAPTER II

REVIEW OF LITERATURE

2.1 Effects of aphasia on individual's life.

Aphasia is an acquired impairment in language and cognitive processes caused by organic damage to the brain. It is characterized by a reduction in functions of language content or meaning, language form or structure, language use or function and the cognitive processes which underlie language such as memory and thinking (Chapey, 1981)

Aphasia caused due to TBI, tumor or stroke can affect an individual's function and life participation. Hence, currently research in aphasia assessment and management; focus more on activity of individual with aphasia, interpersonal relationship in social environment, and life participation. Affected life participation and social functions in individual with aphasia will result in handicap.

Handicap in individuals with aphasia is majorly due to language disabilities. It also negatively influences the situations that are involving communication, altered interpersonal relationship, social stigmatization and restricted activity (Le Dorze & Brassard, 1995).

2.2 Existing classifications and models.

In recent years, there has been a shift from classical biomedical models to models which consider organic as well as functional factors. There has been growing awareness of the importance of health classification in speech-language pathology because of its effect on health funding and intra- and inter-profession communications (Ma, Worrall, & Threats,

2007). There is also an emerging need for speech-language pathologists to be aware of frameworks that deals with functional health. Following are few of the existing frameworks:

2.2.1 International classification of functioning, disability and health (ICF) World Health Organization 2001

ICF defines the components of health and some health related components of well-being. Hence, the domains considered in ICF can be viewed in terms of health and health related components.

ICF domains are described from the perspective of the body, the individual and society in two basic lists:

- (1) Body Functions and Structures; and
- (2) Activities and Participation

Functioning is an umbrella term which includes all body functions, activities and participation; similarly, disability serves as an umbrella term for impairments, activity limitations or participation restriction.

ICF has two parts, each with two components:

Part 1: Functioning and Disability

- (a) Body Functions and Structures
- (b) Activities and Participation

Part 2: Contextual Factors

- (c) Environmental Factors
- (d) Personal Factors

Table 1: An overview of ICF, terms and definitions described in ICF [Source: The International Classification of Functioning, Disability and Health (ICF), World Health Organization, 2001]

Terms	Definitions
Body Functions	Physiological functions of body systems (including psychological functions)
Body Structures	Anatomical parts of the body such as organs, limbs and their components
Impairments	Problems in body function or structure such as a significant deviation or loss
Activity	Execution of a task or action by an individual
Participation	Involvement in a life situation
Activity Limitations	Difficulties an individual may have in executing activities
Participation Restrictions	Problems an individual may experience in involvement in life situations.
Environmental Factors	Make up the physical, social and attitudinal environment in which people live and conduct their lives

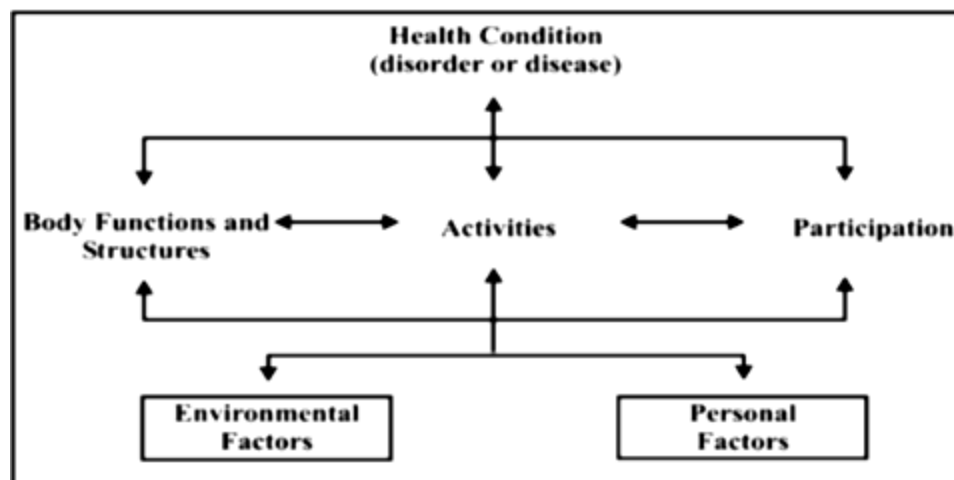


Figure.1. ICF schematic [Source: The International Classification of Functioning, Disability and Health (ICF), World Health Organization, 2001].

Applications of ICF (International classification of functioning disability and health., 2001):

- a. It can be used as a **statistical tool**: in the collection and recording of data (e.g. in population studies and surveys or in management information systems);
- b. It can be used as a **research tool**: to measure outcomes, quality of life or environmental factors;
- c. It can be used as a **clinical tool**: in needs assessment, matching treatments with specific conditions, vocational assessment, rehabilitation and outcome evaluation;
- d. It can be used as a **social policy tool**: in social security planning, compensation systems and policy design and implementation;
- e. It can be used as an **educational tool**: in curriculum design and to raise awareness and undertake social action.

ICF is inherently a health and health-related classification (WHO, 2001) it is also used by sectors such as insurance, social security, labour, education, economics, social policy and general legislation development, and environmental modification

2.2.2 WHO classification of handicap, impairment and disability.

International Classification of Impairments, Disabilities, and Handicaps (ICIDH); WHO 1980

ICIDH describes the circumstances of the individual with disability across a wide range of settings. The ICIDH is directly applied to the care of individuals in diagnosis and treatment, evaluation of treatment results, assessment for work, and information.

The limited scope of medical models of illness results in increased difficulties. This concept of disease can be depicted symbolically in a sequence is shown in Fig 2.



Figure 2: Schematic representation of concept of disease explained by ICD in 6th revision.

The International classification of diseases (ICD) 6th revision is based on the components of the sequence depicted in Figure 2. However, such a model fails to reflect the full range of problems that lead people to make contact with a health care system (International Classification of Impairments, Disabilities, 1980).

Persons with illness are unable to sustain the accustomed social role resulting in poor maintains of customary relationships with others. ICD in its 9th revision tackles, problem by altering the components of the sequence, the revised are shown in Figure 3 (International Classification of Impairments, Disabilities, 1980)

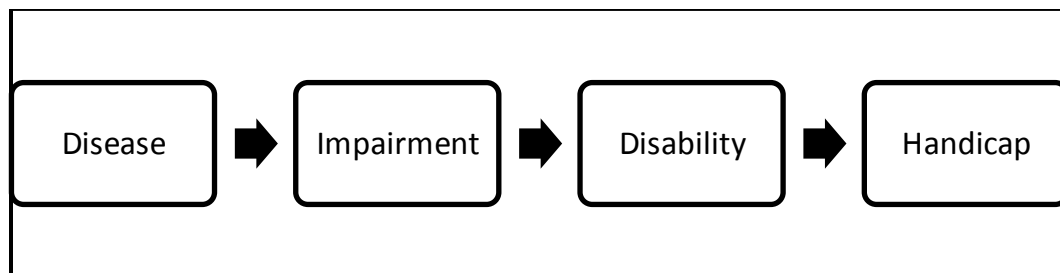


Figure 3: Concept of disease modified by ICD in 9th revision.

Various approaches provide greater emphasis on functions such as, activities of daily living during assessment procedure (Wood & Badley, 1978). The various consequences of diseases would be Impairment, Disability and Handicap.

Impairment

“In the context of health experience, impairment is any loss or abnormality of psychological, physiological, or anatomical structure or function” (ICIDH, 1980)

Impairment refers to temporary or permanent loss or abnormality. It can be either structural or functional deficit including the system of mental function.

Disability

“In the context of health experience, a disability is any restriction or lack (resulting from an impairment) of ability to perform an activity in the manner or within the range considered normal for a human being” (ICIDH, 1980)

Disability represents the deviation from the norms and is characterized either by excesses or deficiencies of expected behavior or activity which may be temporary or permanent, reversible or irreversible, and progressive or regressive.

Handicap

“In the context of health experience, a handicap is a disadvantage for a given individual, resulting from an impairment or a disability, that limits or prevents the fulfillment of a role that is normal (depending on age, sex, and social and cultural factors) for that individual” (ICIDH, 1980)

Handicap is a social phenomenon, representing the social consequences of an individual which has occurred due to presence of impairment and disability.

2.2.3 Handicap classification:

Handicap is a social phenomenon and hence classification of handicap based on the circumstances of individual with disability on their society has stated by ICDIH, WHO 1980. There are six major domains in classification. These domains are considered as the survival roles. Handicap classification is desirable that individuals always be identified on each dimension or survival role. This provides a profile of their disadvantage status. In each survival roles the below mentioned score categories are provided:

- a. Orientation handicap
- b. Physical independence handicap
- c. Mobility handicap
- d. Occupation handicap
- e. Social integration handicap
- f. Economic self-sufficiency handicap

a. ORIENTATION HANDICAP

Orientation is an ability of an individual to orient him/her-self to him/her-surrounding. It includes reciprocation, interaction with the surrounding, reception of signals from the surrounding with various sensory modalities, assimilating the signal and expression of the signal to the assimilated signal. To identify handicap, scoring can be done. Scores ranges from 0 to 9 where, “0” represents fully oriented and, “9” represents unspecified.

b. PHYSICAL INDEPENDENCE HANDICAP

Physical independence is an ability of an individual to sustain an independence existence. It includes aids, assistance, self-care and other activities of daily living. To identify handicap, scoring can be done. Scores range from 0 to 9 where, “0” represents fully oriented and, “9” represents unspecified.

c. MOBILITY HANDICAP

Mobility refers to an ability of an individual to move around effectively in his/her surroundings. It includes extent of mobility of an individual from his/her reference point (for his/her bed) with appropriate augmentation by using any kind of assistive devices. To identify handicap, scoring can be done. Scores range from 0 to 9 where, “0” represents fully oriented and, “9” represents unspecified.

d. OCCUPATION HANDICAP

Occupation is an ability of an individual to occupy him/her-self in an activity according to the individual’s age, gender, and culture. It includes play or recreation, employment, and the elderly pursuing occupations which is appropriate to their age group. To identify handicap, scoring can be done. Scores range from 0 to 9 where, “0” represents fully oriented and, “9” represents unspecified.

e. SOCIAL INTEGRATION HANDICAP

Social integration is an ability of an individual to build and maintain appropriate social relationships. It includes a wide range of contact of an individual considering him/her as a reference point. To identify handicap, scoring can be done. Scores range from 0 to 9 where, “0” represents fully oriented and, “9” represents unspecified.

f. ECONOMIC SELF-SUFFICIENCY HANDICAP

Economic self-sufficiency is an ability of an individual to maintain appropriate socioeconomic activity and independence. It includes, benefits of an individual through salary, pension or through any other sources. To identify handicap, scoring can be done. Scores ranges from 0 to 9 where, “0” represents fully oriented and, “9” represents unspecified.

2.3 Available questionnaires and assessment tools to assess activity and participation of individuals with aphasia.

In earlier literature research in aphasia was majorly focused on linguistic characteristics. But, the current research focuses more on the quality of life, activity and daily living of individuals with aphasia. There are plenty of assessment tools are available to assess the activity, participation, daily living and quality of life in individuals with aphasia. Few of the available questionnaires are mentioned below,

Functional Independence Measure (FIM) (Zeltzer, Bitensky & Sitcoff, 2011)

FIM is developed to measure the disability classified by International classification of disability, impairment and handicap which is used in the medical system of United States. In this measure, the level of the patient’s disability refers to the level of support and help needed by the person. The scoring for the measure will is done based on the person’s need of assistance from others.

Community Integration Questionnaire (CIQ) (*Dalemans, Witte, Beurskens, Heuvel, Wade, 2010*)

Community integration questionnaire (CIQ) was developed who assess the integration of an individual into various situation like, home, family, productivity, and social activity. CIQ is a 15 item questionnaire including three major domains, home integration, social integration and productivity. It is one of the reliable tools which can be used to assess the activity and participation of an individual.

Communicative Effectiveness Index (CETI) (*Lomas, Pickard, Bester, Elbard, Finlayson, & Zoghaib, 1989; Muller Pedersen, Vinter, & Skyhuj Olsen, 2001*)

It assesses four domains of functional communication skills including social need, life skill, basic need and health threat. It employs a 16 item questionnaire. Each question is concerned with an everyday situation and paired with a visual analogue scale, which the caregivers have to mark. It relies mainly on the person's communicative interaction with spouses or significant others in 16 different situations.

Functional Communication Profile (FCP) (*Sarno, 1969*)

FCP was the first standardized attempt to assess the functional usefulness of language ability in the everyday life of person with aphasia. It employs a nine point rating scale on which 45 behaviors are rated. The estimates are obtained from informal interviews and formal test performances. The scale ranges from 'normal' (100%) to 'absent' (0%) ability. The 45 behaviors are grouped into 5 categories i.e. movement, speaking, understanding, reading and others.

Communication Activities of Daily Living (CADL) (*Holland, 1980*)

This tool was designed to measure the functional communicative ability of daily life in persons with aphasia. CADL uses familiar situations for examining interpersonal interaction and response to communicative problems such as making an appointment, shopping at a store etc. It consists of 68 items which are organized within a series of situations and within each situation. Items are arranged according to the natural sequence in which behavior would occur. The test assesses skills such as reading, writing, and estimation of time, use of verbal and nonverbal contexts in communication, role playing, social conventions, non-verbal symbolic communication, humor, absurdity, and metaphor.

American Speech-Language Hearing Association Functional Assessment of Communication Skills for Adults -ASHA FACS (*Frattali, Thompson, Holland, Wohl, & Ferketic, 1995*)

It relies on observation of both the informant and the speech and language pathologist. It has 43 items which are rated on a seven point scale. It covers social communication, communication of basic needs, reading, writing and number concepts and daily planning.

2.4. Craig Handicap Assessment and Reporting Technique (CHART) (*Whiteneck, Brooks, Charlifue, Gerhart, Mellick, & Overholser, 2001*)

World Health Organization (WHO, 1980) has provided a model of disablement which provided a distinction between impairment, disability and handicap. Handicap

describes various consequences of disability which interplay; they are social, environmental, economics and culture.

World Health Organization (WHO, 1980) provides six dimensions by which the level of handicap can be measured, the details of these dimensions are given below

- Physical independence
- Cognitive independence
- Mobility
- Occupation
- Social Integration
- Economic self sufficiency

CHART was developed to measure the six dimensions provided by World Health Organization (WHO, 1980). Initially, in 1999 Whiteneck developed Craig handicap and assessment reporting technique-Short form (CHART-SF). It included a total of nineteen questions divided into five sub groups. Out of these nineteen questions, first subsection has three questions, second subsection has three questions, third subsection has five questions, fourth subsection has six questions, and fifth subsection has two questions.

The various sub-sections are:

1. What assistance do you need?
2. Are you up and about regularly?
3. How do you spend your time?

4. With whom do you spend time?
5. What financial resources do you have?

This tool was administered on various disabilities which includes, Traumatic brain injury, burns, amputees, spinal cord injury, multiple sclerosis and stroke. Results indicated high correlation between all the subscales in the CHART-SF.

In 2001, Whiteneck et.al, revised the CHART-SF into CHART where, it included total of 32 questions divided into six subscales. The subscales are mentioned below,

- Physical independence
- Cognitive independence
- Mobility
- Occupation
- Social Integration
- Economic self sufficiency

CHARTS assess individual ability in, Activities of Daily Living, Behavior, Cognition, Functional Mobility, Occupational Performance, Social Relationships, and Social Support. CHART is available in six different languages. They are English, Spanish, Japanese, Chinese, Korean and in Italian. Scoring of CHART includes scores ranging from “zero” to “one hundred” in each sub groups. Maximum total score that, one can score in CHART is “six hundred”. Higher scores indicate reduced level of handicap.

Several studies are present which uses CHART to assess the level of handicap across various disorders, but, no studies have been conducted to assess the performance of neuro-typical individuals in CHART. However, norms for CHART have been developed for various disorders.

2.5. Studies done on individuals with spinal cord injury (SCI) stroke and traumatic brain injury (TBI) by using CHART to assess level of handicap.

Most of the studies have been conducted using CHART on individuals with spinal cord injury. There are few studies conducted to check the level of handicap across various disorders like spinal cord injury, stroke, brain injury, amputation, burns and multiple sclerosis. CHART is a an effective tool to assess the level of handicap not only in individuals with spinal cord injury (SCI) but also in various other disorders like multiple sclerosis (MS), amputation, burns, stroke, and brain injury also it has a very good test retest reliability (Walker, Mellick, Brooks, & Whiteneck, 2003)

Odella, et. al, (2013), conducted a study, wherein to compare the outcomes of individuals with TBI and stroke using CHART-SF. They found that, in various domains such as, physical independence, cognitive independence, mobility, occupation and in social integration, individuals with TBI had better independence than individuals with stroke.

Studies conducted on individuals with Spinal cord injury (SCI) using CHART

In 2004 Forchheimer, Kalpakjian, & Tate, assessed the community integration and relationship of gender in environmental barriers among 2048 individuals with Spinal cord injury using CHART. Similarly Golhasani-keshtan, Ebrahimzadeh, Fattahi, Soltani-

moghaddas, & Omid-kashani, 2013 had examined the psychometric properties of CHART adapted in Persian language for 52 individuals with Spinal cord injury. Samuelkamaleshkumar et al., (2010) used CHART to examine the community integration in individuals with spinal cord injury in south Indian population for 104 individuals with spinal cord injury. Further Tozato, (2005) had assessed the reliability and validity of CHART in Japanese in 293 individuals with spinal cord injury.

Studies done on individuals with stroke and traumatic brain injury (TBI) using CHART

In 1997, Segal, et. al had validated CHART including 25 stroke survivors and their caregivers. They concluded that, CHART has good construct validity especially for domains like physical independence, mobility and occupation. Similarly, Walker et al., in 2003 had examined the efficacy of CHART across disorders in 1100 individuals with SCI, brain injury, MS, stroke, amputation, and burns. They found that, CHART is an appropriate tool to measure physical and cognitive impairments. Salter, Foley, Jutai, Bayley, & Teasell, (2008) provided a review about tools available to assess community integration in individuals with TBI. It was found that, CHART provides a comprehensive assessment of handicap but, validation of the tool for individuals with TBI is limited.

Srinivasan et al., (2009) compared the effect of deficiency of pituitary function on life satisfaction and functions in individuals with TBI and subarachnoid hemorrhage (SAH) in 18 individuals with TBI and 16 individuals with SAH. CHART was used to check the life satisfaction and function in TBI and SAH. They found that, function and life satisfaction are reduced in individuals with growth hormone deficiency when compared to individuals with growth hormone sufficiency. Similarly, Clancy M et al., (2012) had

determined the effectiveness of multidisciplinary approach in post-acute TBI adults. It was found that, CHART is an effective and promising tool for measuring community integration in individuals with post-acute TBI. Further, Wilde et al., in 2010 summarize the outcome measures available for individuals with TBI, and reported that, CHART is a reliable and valid measure in measuring participation in individuals with TBI.

CHAPTER III

METHOD

The main aim of the present study was to adapt the Revised Craig Handicap Assessment and Reporting Technique (CHART) in Kannada to check the level of handicap in Neuro typical individuals and neurological insult.

Operational definitions:

- *Traumatic Brain injury (TBI)*: it can be referred as damage to the brain that may possibly be permanent caused by injuries like a severe blow, damage due to some external force.
- *Brain Tumor*: It can be defined as an abnormal collection of mass or cells that grow in the brain. These abnormal cell growth or mass can either be benign (non-cancerous) or malignant (which spreads to other parts of the body).
- *Kannada*: It is one of the Dravidian languages spoken by a large number of populations predominantly in the state of Karnataka, India.
- *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.
- *Post stroke onset*: This refers to the duration that has passed since the episode of stroke.

The study included six phases:

1. Permission from authors

Prior to the commencement of the adaptation, permission from the developers of the Revised Craig Handicap Assessment and Reporting Technique (CHART) was taken.

2. Adaptation of the CHART to Kannada language

Revised Craig Handicap Assessment and Reporting Technique (CHART) included six major domains namely;

- **Physical independence:** The ability to sustain a customary effective independent existence.
- **Cognitive independence:** is the individual's ability to sustain a customary level of independence without the need for supervision
- **Mobility:** The ability to move around the one's surrounding.
- **Occupation:** The ability to occupy one's time in the manner customary to a person's sex, age, and culture.
- **Social integration:** The ability to participate in and maintain customary social relationships.
- **Economic self-sufficiency:** The ability to sustain customary socio-economic activity and independence

Adaptation of the Revised Craig Handicap assessment and reporting technique (CHART) included two steps:

Step 1: Translation of the CHART to Kannada language.

The questionnaire includes total of thirty two questions. Each question was translated to Kannada language keeping in mind the age appropriate, culturally, socially and ethically acceptable questions by a Speech language pathologist (SLP).

Step 2: Add/ Remove the questions that are (not) relevant to Indian context specifically in Karnataka

Among the thirty two questions, question number twenty six under the domain social integration was not culturally acceptable. This was replaced by a culturally and socially accepted question after obtaining feedback from various Speech-Language Pathologists. Additionally in the domain economic self-sufficiency one question was added. The adapted Revised Craig Handicap assessment and reporting technique (CHART) in Kannada has thirty three questions in the questionnaire (Appendix I).

3. Validation

The translated material was given to ten judges (nine Speech-Language Pathologists and one Linguist). Judges were native Kannada speakers who were proficient in reading and writing Kannada. They were asked to rate the questions on a Feedback questionnaire for aphasia management manual (Field testing of Manual for

Adult Non-fluent Aphasia therapy manual- *MANAT-K*, Goswami, Shanbal, Samasthitha & Navitha, 2010).

Table 2: Represents the validation of the material

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

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

Inclusion criteria for Neuro typical individuals:

- Participant should know to read and write Kannada language.
- All the participants should be native Kannada speakers.
- No linguistic deficit, cognitive deficit, physical / motor deficit, sensory deficit.

Inclusion criteria for individuals with aphasia:

- Aphasia following stroke or 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.

4. Administration of the adapted material

Data collection included following steps:

Step 1: Recruitment of the participants

A total of one hundred and ten participants between 25 years to 75 years of age were included in the study. Participants were divided into six groups where, Group I to Group V included 20 participants with equal number of men and women and Group VI included 10 individuals with aphasia. The mean age was 29.75 for Group I, 40.05 for Group II, 50.6 for Group III, 60.75 for Group IV and 71.4 for Group V and 43.7 for group VI. Participants with no linguistic, physical/ motor, sensory and cognitive deficits and who knows to read and write Kannada were considered for neuro-typical group.

Table 3: Details of participants

Subgroup	Age range	Total number of participants
Group I	>25 to ≤35	20
Group II	>35 to ≤45	20
Group III	>45 to ≤55	20
Group IV	>55 to ≤65	20
Group V	>65 to ≤75	20

In Group VI all the participants were diagnosed as Aphasia by a Speech-language Pathologist using an adapted Kannada version of Western Aphasia battery (WAB, Shyamala & Vijayashree, 2009). The diagnosis of Aphasia has been supported by the radiological and neurological reports.

Table 4: Demographic details of each participant in group IV

Sl. No	Age	Gender	Causes	Duration of speech and language therapy	Aphasia Quotient scores on WAB	Provisional diagnosis
1	44	Male	Stroke	4 months	73.3	Anomic Aphasia
2	50	Male	Stroke	1 month	6.6	Global Aphasia
3	56	Male	Stroke	2 months	86.3	Anomic Aphasia
4	53	Male	Stroke	1 month	5.6	Global Aphasia
5	50	Male	Stroke	2 days	6.3	Global Aphasia
6	27	Female	TBI	1.6 years	73	Conduction Aphasia
7	32	Female	Tumor	3 month	55.4	Broca's Aphasia
8	40	Female	Stroke	1 month	55.3	Broca's Aphasia
9	25	Male	TBI	2 months	76.6	Anomic Aphasia
10	60	Male	Stroke	3 months	59.6	Broca's Aphasia

Step2: Procedure for Administering CHART

Participants and caregivers (spouse, daughter and or son) were explained the aim and procedures of the study, and an informal verbal and/ or written consent (Appendix-II) were obtained. Participants were randomly selected. Participants 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 Revised Craig Handicap Assessment and Reporting Technique (CHART) in Kannada and were asked to answer all the questions which were present in the material. 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 clinician through interview method. Graphic response includes participants writing their response in the questionnaire. Test time was about ten to twenty minutes.

Step3: Scoring the samples.

Revised Craig Handicap assessment and reporting technique (CHART) in Kannada included a total of thirty-two questions which were divided into six major domains (Physical independence, Cognitive independence, mobility, social integration, occupation and economic self-sufficiency). In each domain, the maximum scoring is hundred. In each question scoring is done in terms of number of hours per day/ per week.

The tool was designed to measure handicap, not to identify the characteristics shared by ‘super-achievers.’ Therefore, although it is possible to score more than hundred on most of the subscales, a maximum of hundred points will be allowed, as a score of hundred would indicate no handicap in that dimension. Revised Craig Handicap Assessment and Reporting Technique (CHART) in Kannada have maximum score of six-hundred. Lower scores indicate the presence of handicap and higher scores indicates the absence of handicap in individuals with stroke and traumatic brain injury.

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.

6. Analysis of the data

The obtained scores was tabulated in an excel sheet. Obtained data was subjected to statistical analysis using the SPSS software (version 17.0).

CHAPTER IV

RESULTS

The present study aimed at validating and adapting Craig Handicap Assessment and Reporting Technique (CHART) to Kannada language. CHART was developed to measure the dimensions of handicap given by World Health organization (WHO) in 2001. CHART includes thirty two questions which are divided into six domains. They are physical independence, cognitive independence, mobility, occupation, social integration and economic self-sufficiency.

In the present study, CHART was administered on one hundred neuro-typical individuals (age range: 25years to 75years) and on ten individuals with aphasia (age range: 25years to 75years) in a face to face interview. Aphasia group included individuals varying in type of aphasia.

The obtained results were tabulated and subjected to statistical analysis using SPSS software (Version 17.0). To check the normality of data obtained 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 was obtained using descriptive statistics. Further, different age groups, gender groups and other factors were compared using Kruskal -Wallis and Mann Whitney U test.

The results obtained were analysed in various aspects. The findings of the data are presented under following headings;

1. Performance of normal individuals in each group across various domains of CHART-K.
2. Performance of males and females in each group and across groups in various domains of CHART-K.
3. Overall performance across age groups in normal individuals
4. Overall performance across gender
5. Performance of normal individuals across education
6. Performance of normal individuals across occupation
7. Comparing the difference between age groups, gender groups, education and occupation.
8. Comparison of normal individuals and persons with aphasia across various domains of CHART-K.
9. Comparison of domains of CHART-K between various types of aphasia.

1. Performance of normal individuals in each group across various domains of CHART-K

Mean median, standard deviation (SD) and 95% confidence interval for mean was obtained for each of the domain of CHART-K. Details of these are presented in the following sections.

The domains of CHART-K are,

- a. Physical independence
- b. Cognitive independence
- c. Mobility
- d. Occupation
- e. Social integration
- f. Economic self sufficiency

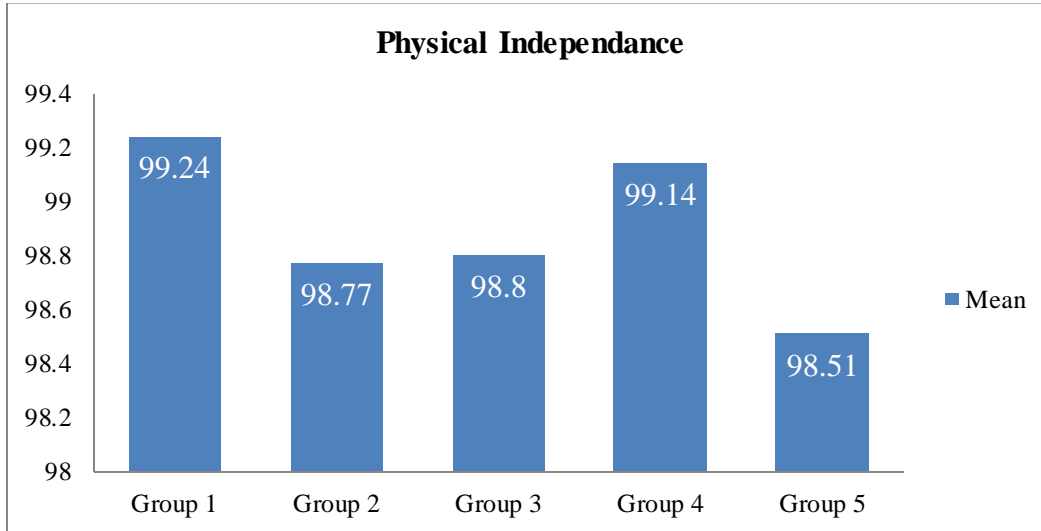
a. Physical independence

Physical independence is an ability of an individual to sustain independent existence. Table-5 and graph-1 shows the mean median, SD and 95% of confidence interval for mean in the physical independence domain.

Table-5: Mean median, standard deviation (SD) and 95% confidence interval for mean across different age groups for physical independence domain.

Age groups	N	Mean	Standard deviation (SD)	Median	95% Confidence Interval for mean	
Group 1	20	99.24	1.208	100.00	98.68	99.81
Group 2	20	98.77	1.428	99.55	98.10	99.44
Group 3	20	98.50	1.462	98.25	97.82	99.18
Group 4	20	99.14	1.160	100.00	98.60	99.69
Group 5	20	98.51	1.309	98.75	97.90	99.12

Graph-1: Mean scores for physical independence domain across each group.



In physical independence domain the mean scores of group 1 (>25 to ≤35 years) is higher i.e 99.24 (SD: 1.208) followed by group 4 (>55 to ≤65 years) 99.14 (SD: 1.160), group 3 (>45 to ≤55 years) 98.80 (SD: 1.462), group 2 (>35 to ≤45 years) 98.77 (SD: 1.428), and group 5 (>65 to ≤75 years) 98.51 (SD: 1.309).

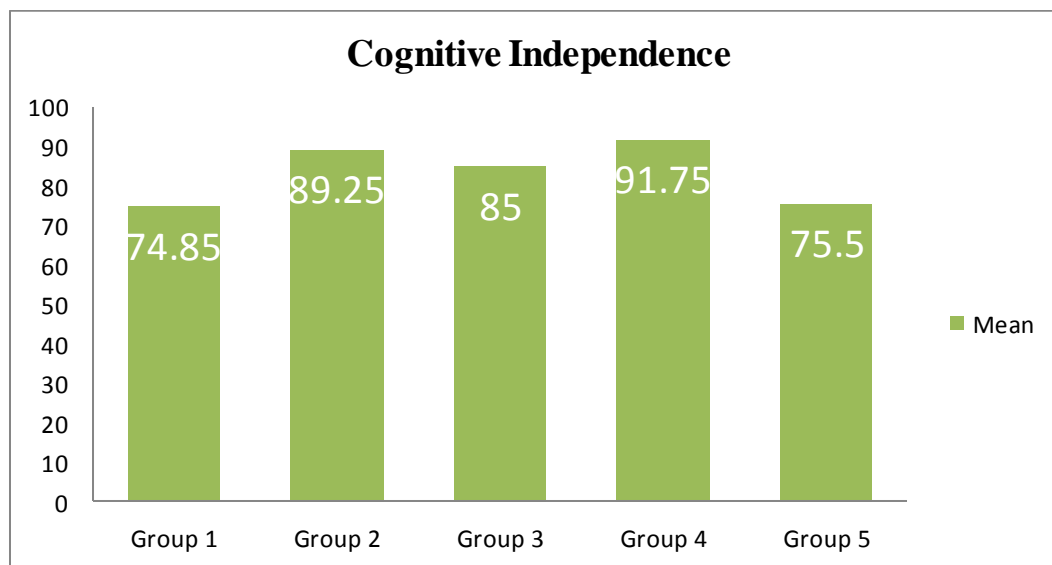
b. Cognitive independence

It is an ability of an individual to sustain a level of independence without any supervision. Table- 6 and graph-2 represents the mean scores, median, SD and 95% confidence interval for the domain cognitive independence.

Table-6: Mean, median, standard deviation (SD) and 95% confidence interval for mean across different age groups for cognitive independence domain

Age groups	N	Mean	Standard deviation (SD)	Median	95% Confidence Interval for mean	
Group 1	20	74.85	19.818	78.50	65.57	84.13
Group 2	20	89.25	10.833	91.00	84.18	94.32
Group 3	20	85.00	19.984	98.00	75.65	94.35
Group 4	20	91.75	12.294	100.00	86.00	97.50
Group 5	20	75.50	22.317	70.00	65.06	85.94

Graph-2: Mean scores for cognitive independence across age groups.



Further, the mean scores obtained are slightly higher in the group 4 (>55 to ≤65 years) 99.75(SD: 12.294) and the lower mean scores are obtained for group 1(>25 to ≤35 years) 74.85 (SD: 19.818) in cognitive independence domain. Whereas, the other groups have obtained the mean scores ranging between group 4 (>55 to ≤65 years) and group 1 (>25 to ≤35 years).

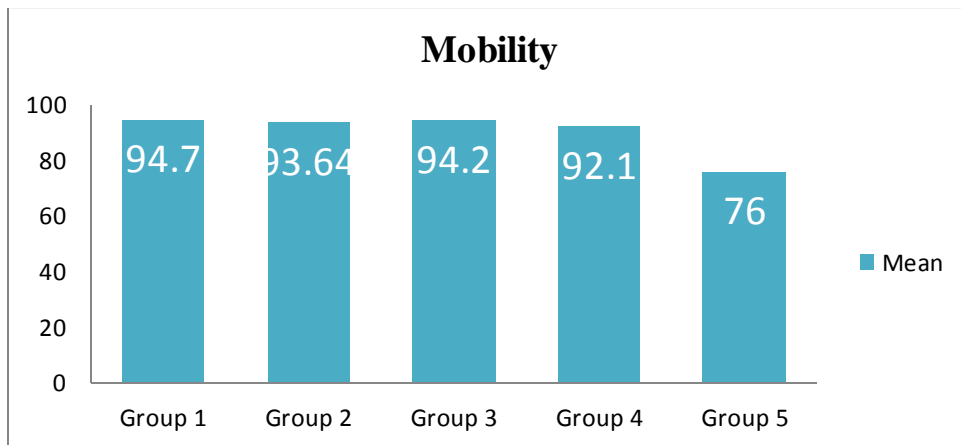
c. Mobility

Mobility refers to the ability of an individual to move around effectively in his/her surroundings. Table-7 and graph-3 shows the descriptive statistics of the data for the domain mobility.

Table-7: Mean, median, standard deviation (SD) and 95% confidence interval for mean across different age groups for mobility domain

Age groups	N	Mean	Standard deviation (SD)	Median	95% Confidence Interval for mean	
Group 1	20	94.70	8.304	100.00	90.81	98.59
Group 2	20	93.65	8.336	98.50	89.75	97.55
Group 3	20	94.20	8.906	100.00	90.03	98.37
Group 4	20	92.10	9.645	94.00	87.59	96.61
Group 5	20	76.00	19.463	68.00	66.89	85.11

Graph-3: Mean scores for the domain mobility for each group.



In mobility the mean scores were almost similar for the group 1 (>25 to ≤35 years), 2 (>35 to ≤45 years), 3 (>45 to ≤55 years) and 4 (>55 to ≤65 years) among them, the lower mean scores was observed for the group 5 (>65 to ≤75 years) 76 (SD: 19.463) and the higher mean scores for group 1 (>25 to ≤35 years) 94.7 (SD: 8.304).

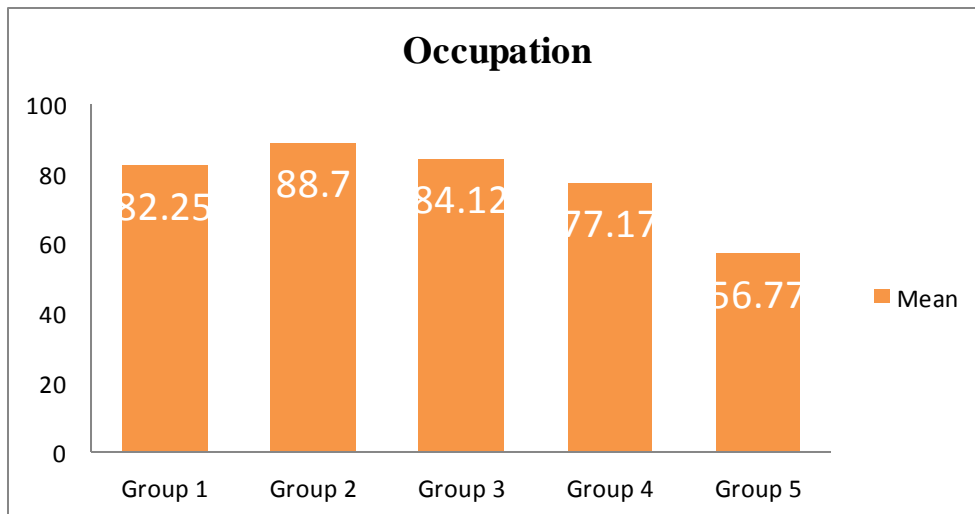
d. Occupation

The ability of an individual to occupy him/her-self in an activity which is appropriate to their age, gender and culture is called as occupation. The mean scores, median, SD and 95% of confidence interval for mean has been represented in the table as well as in the graph mentioned below.

Table-8: Mean median, standard deviation (SD) and 95% confidence interval for mean across different age groups for occupation domain.

Age groups	N	Mean	Standard deviation (SD)	Median	95% Confidence Interval for mean	
Group 1	20	82.25	24.259	99.00	70.90	93.60
Group 2	20	88.70	16.755	100.00	80.86	96.54
Group 3	20	84.12	20.178	95.50	74.68	93.57
Group 4	20	77.17	24.114	85.00	65.89	88.46
Group 5	20	56.77	32.667	52.50	41.49	72.06

Graph-4: Mean scores for the domain occupation across each age group.



In occupation domain of CHART-K the mean scores were decreasing from the age group 2 (>35 to ≤45 years) to 5 (>65 to ≤75 years) and the increased mean scores were obtained for the age group 2(>35 to ≤45 years) 88.7 (SD: 16.755) and the reduced mean scores for the age group 5(>65 to ≤75 years) 56.77 (SD: 32.667)

e. Social integration

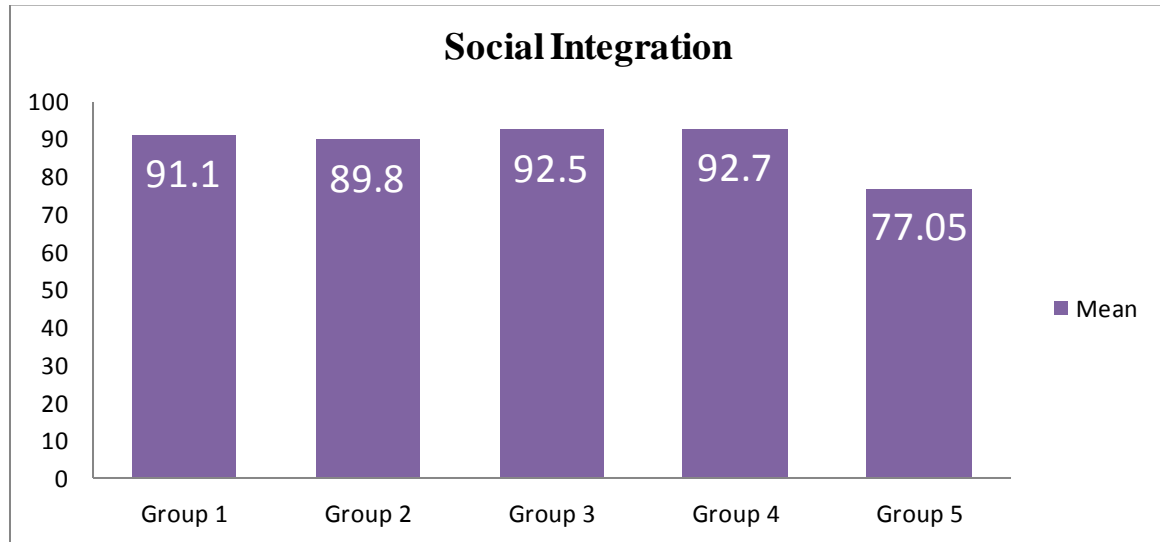
Social integration majorly deals with the ability of an individual to maintain social relationship.

Table-9: Mean, median, standard deviation (SD) and 95% confidence interval for mean across different age groups for social integration domain

Age groups	N	Mean	Standard deviation (SD)	Median	95% Confidence Interval for mean	
Group 1	20	91.10	12.744	100.00	85.14	97.06
Group 2	20	89.80	12.988	96.50	83.72	95.88
Group 3	20	92.50	8.369	95.00	88.58	96.42
Group 4	20	92.70	10.593	98.00	87.74	97.66
Group 5	20	77.05	20.944	75.50	67.25	86.85

The mean scores for the domain social integration were compared with the groups and slightly increased mean scores were obtained for the age group 4 (>55 to ≤65 years) 92.7 (SD: 10.593) and the lower mean scores when compared to other groups were obtained for the age group 5 (>65 to ≤75 years) 77.05 (SD: 20.944).

Graph-5: Mean scores for each age group for the domain social integration.



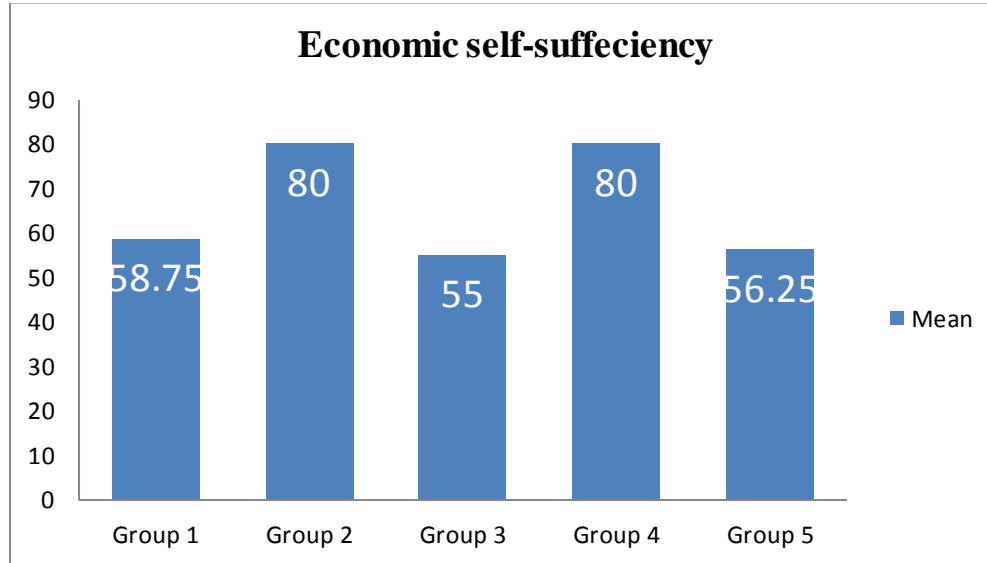
f. Economic self sufficiency

An ability of an individual to maintain appropriate socio-economic activity and independence is termed as economic self-sufficiency. The descriptive statistics for the data in the domain economic self-sufficiency has been provided in the Table and Graph below.

Table-10: Mean, median, standard deviation (SD) and 95% confidence interval for mean across different age groups for economic self-sufficiency domain

Age groups	N	Mean	Standard deviation (SD)	Median	95% Confidence Interval for mean	
Group 1	20	58.75	49.520	100.00	35.57	81.93
Group 2	20	80.00	34.027	100.00	64.07	95.93
Group 3	20	55.00	51.041	100.00	31.11	78.89
Group 4	20	80.00	26.407	100.00	67.64	92.36
Group 5	20	56.25	42.048	50.00	36.57	75.93

Graph-6: Mean scores for the domain economic self-sufficiency for each group



Unlike the other domains, in economic self-sufficiency, the mean scores were varying across groups and the highest mean scores for the age group 2 (>35 to ≤45 years) and 4 (>55 to ≤65 years) were obtained. The SD was higher (SD: 34.027) in the age group 2 (>35 to ≤45 years) when compared to age group 4 (>55 to ≤65 years) (SD: 26.407) and lower mean scores were obtained for the group 3 (>45 to ≤55 years) 55 (SD: 51.041).

g. CHART-K Total Scores

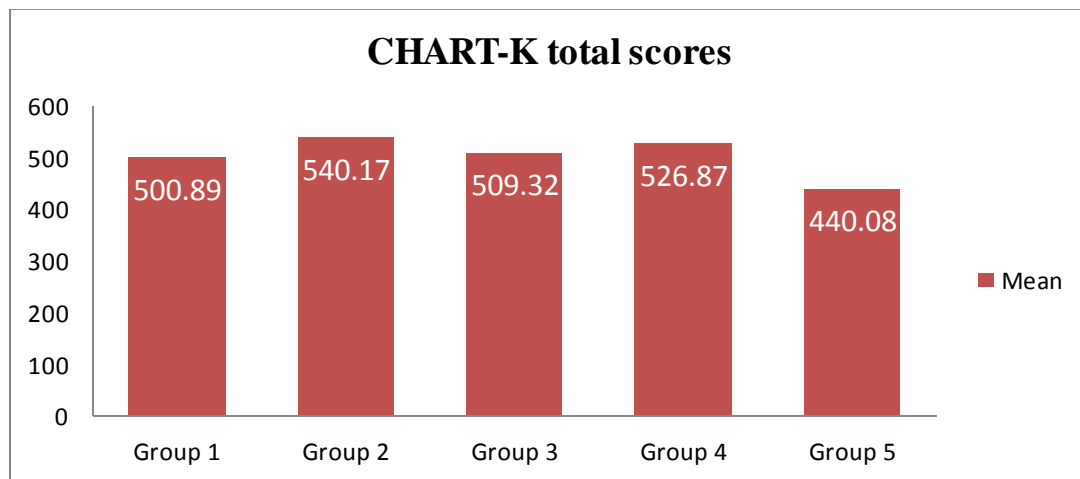
Total scores were obtained by adding the scores obtained in each domain. Table below represents the total scores of each group across each domain.

The total scores were subjected to descriptive analysis and the mean scores for each group were compared. Where, higher mean scores were observed in the age group 2 (>35 to ≤45 years) 540.17 (SD: 52.206) and the lower scores were observed for the age group 5 (>65 to ≤75 years) 440.08 (SD: 104.267)

Table-11: Mean median, standard deviation (SD) and 95% confidence interval for mean across different age groups for CHART-K total score.

Age groups	N	Mean	Standard deviation (SD)	Median	95% Confidence Interval for mean	
Group 1	20	500.89	92.891	547.90	456.58	544.20
Group 2	20	540.17	52.206	554.35	515.74	564.60
Group 3	20	509.32	84.897	557.35	469.59	549.06
Group 4	20	526.87	58.610	544.25	498.63	554.11
Group 5	20	440.08	104.267	488.45	391.29	488.88

Graph-7: Total CHART-K scores across each group.



2. Performance of males and females in each group and across groups in various domains of CHART-K

Further, data obtained was subjected to understand the performance of neuro-typical individuals across each domain. Mean scores, median, SD and confidence interval for mean was obtained for each group across each domain.

a. Physical Independence:

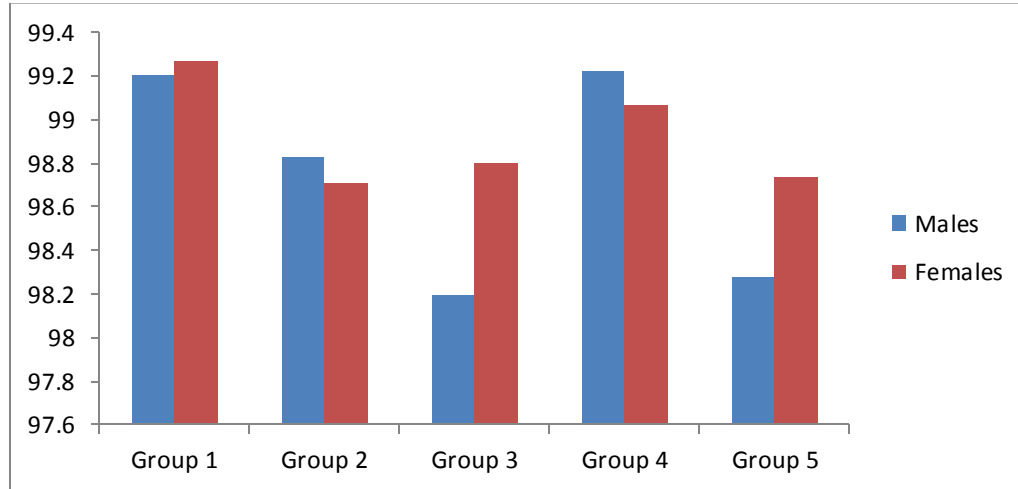
The mean scores are higher for females in age group (1)99.27 (SD: 1.377), age group (3) 98.80 (SD: 1.583) and in age group (5) 98.74 (SD: 1.275) when compared to males. But, in age groups 2 and 4 males have obtained higher mean scores than females. Same is represented in the Table and graph below.

Table 12: Mean scores, median, SD and 95% confidence interval for the each groups across gender.

Age groups	Gender	N	Mean	Standard deviation (SD)	Median	95% Confidence Interval for mean	
Group 1	Male	10	99.21	1.377	100.00	98.22	100
	Female	10	99.27	1.087	99.95	98.49	100
Group 2	Male	10	98.83	1.207	98.80	97.96	99.69
	Female	10	98.71	1.686	99.60	97.50	99.91
Group 3	Male	10	98.20	1.344	97.95	97.23	99.16
	Female	10	98.80	1.583	99.80	97.66	99.93
Group 4	Male	10	99.22	1.157	100.00	98.39	100
	Female	10	99.07	1.220	99.50	98.19	99.94
Group 5	Male	10	98.28	1.369	98.30	97.30	99.26
	Female	10	98.74	1.275	99.20	97.82	99.65

When compared physical independence across gender, males have obtained lower mean scores in group 3 (>45 to ≤55 years) 98.20 (SD: 1.344) and in females the lower scores are obtained in the age group 2 (>35 to ≤45 years) 98.71 (SD:1.686).

Graph 8: Mean scores across gender for each group.

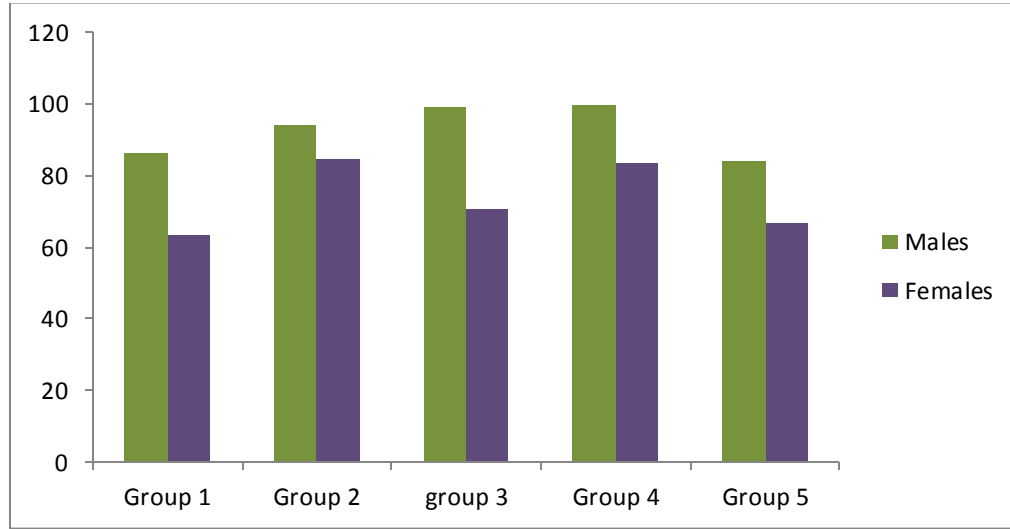


b. Cognitive independence:

Table 13: Mean scores observed across gender in each group for the domain cognitive independence.

Age groups	Gender	N	Mean	Standard deviation (SD)	Median	95% Confidence Interval for mean	
Group 1	Male	10	86.10	12.458	89.00	77.18	95.01
	Female	10	63.60	19.817	59.00	49.42	77.77
Group 2	Male	10	94.00	8.844	100.00	87.67	100
	Female	10	84.50	10.927	84.00	76.68	92.31
Group 3	Male	10	99.20	2.530	100.00	97.39	101.01
	Female	10	70.80	19.714	68.00	56.69	84.90
Group 4	Male	10	100.00	0.000	100.00	100	100
	Female	10	83.50	12.955	84.00	74.23	92.76
Group 5	Male	10	84.00	19.573	96.00	69.99	98
	Female	10	67.00	22.534	53.00	50.88	83.12

Graph 9: Mean scores for each group across gender.



Unlike physical independence, in cognitive independence domain, males scored higher mean values than females in all age groups. Amongst them, males in group 5 scored lower mean values and males in group 4 scored higher mean values. When compared the mean scores for females across groups, group 1 females have obtained lower mean scores and the females in group 2 obtained higher mean scores.

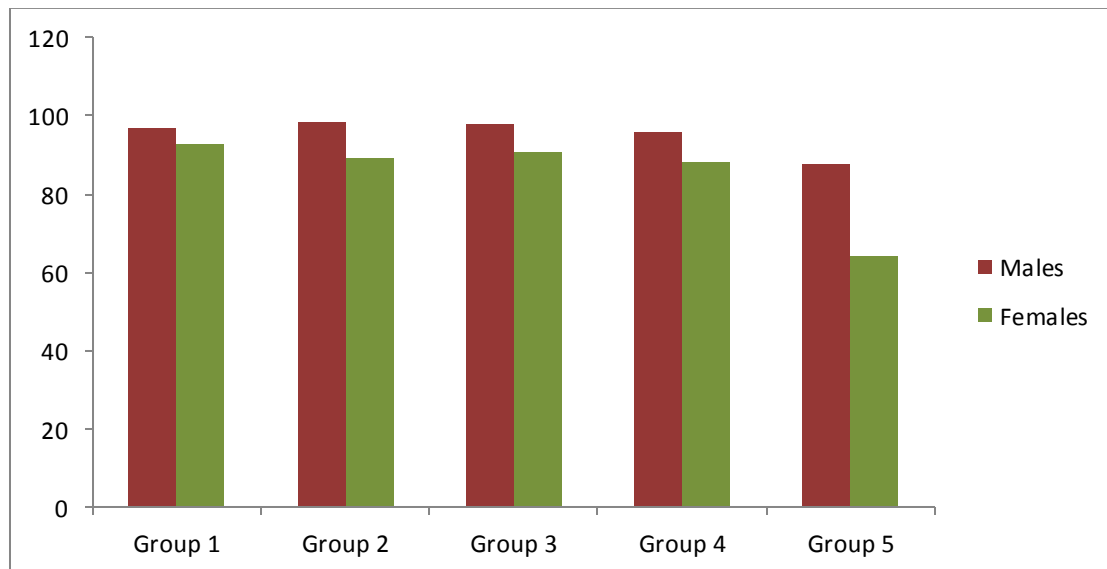
c. Mobility:

Similar results as the domain cognitive independence were also obtained in mobility domain of CHART-K. Males scored higher mean scores in all the groups than females. In males, the mean scores started decreasing from group 3 to group 5 and similar trend was observed in females.

Table 14: Mean standard deviation and median for each group across gender for the domain mobility.

Age groups	Gender	N	Mean	Standard deviation (SD)	Median	95% Confidence Interval for mean	
Group 1	Male	10	96.70	6.237	100.00	92.23	101.16
	Female	10	92.70	9.889	98.50	85.62	99.77
Group 2	Male	10	98.20	4.733	100.00	94.81	101.58
	Female	10	89.10	8.850	89.50	82.76	95.43
Group 3	Male	10	97.70	7.273	100.00	92.49	102.90
	Female	10	90.70	9.346	93.00	84.01	97.38
Group 4	Male	10	96.10	6.488	100.00	91.45	100.74
	Female	10	88.10	10.898	91.00	80.30	95.89
Group 5	Male	10	87.60	16.091	96.50	76.08	99.11
	Female	10	64.40	15.551	60.00	53.27	75.52

Graph 10: Mean scores for males and females for each group.

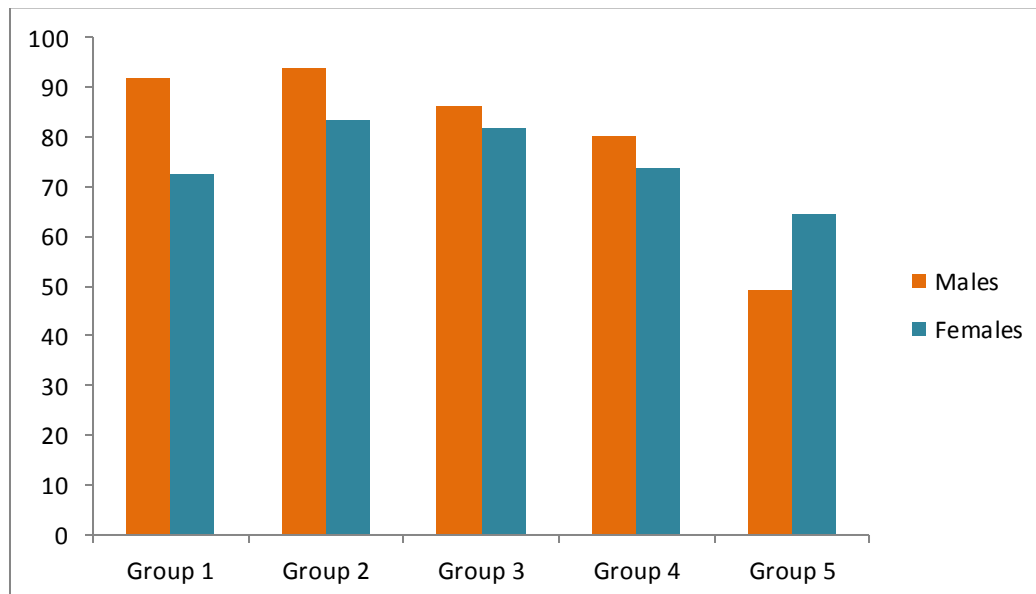


d. Occupation:

Table 15: Mean scores, median and standard deviation for each group across gender for the domain occupation.

Age groups	Gender	N	Mean	Standard deviation (SD)	Median	95% Confidence Interval for mean	
Group 1	Male	10	91.90	13.812	100.00	82.02	101.78
	Female	10	72.60	29.065	75.00	51.80	93.39
Group 2	Male	10	93.80	8.929	100.00	87.41	100.18
	Female	10	83.60	21.334	100.00	68.33	98.86
Group 3	Male	10	86.30	14.712	90.00	75.77	96.82
	Female	10	81.95	25.151	95.50	63.95	99.94
Group 4	Male	10	80.40	20.818	84.00	65.50	95.29
	Female	10	73.95	27.769	85.00	54.08	93.81
Group 5	Male	10	49.05	32.554	45.75	25.76	72.33
	Female	10	64.50	32.565	61.00	41.20	87.79

Graph 11: Mean scores for each group across gender.



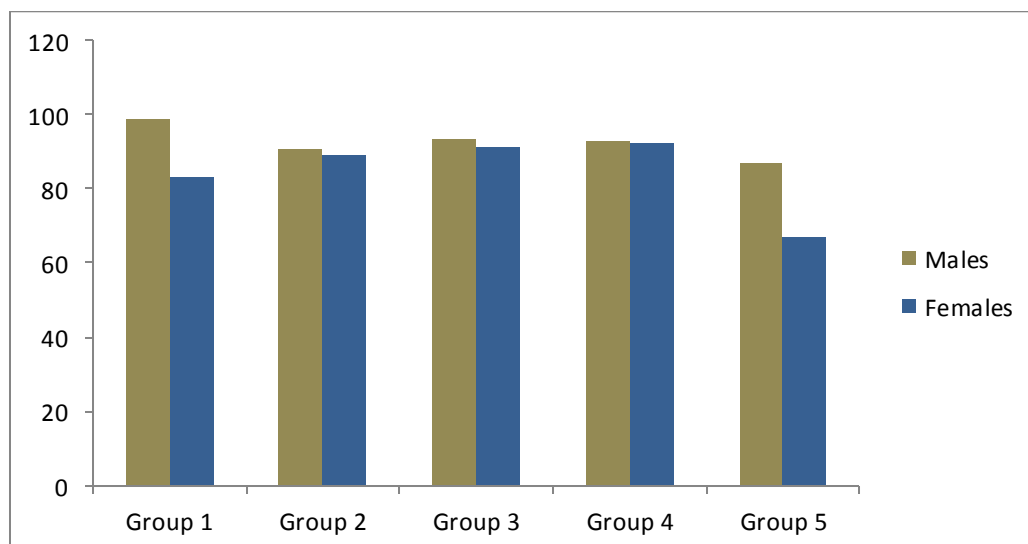
Further, in the occupation domain, the mean scores are higher for males than females in all age group except group 5. Whereas, in group 5, the females have scored higher mean scores than males.

e. Social integration:

Table 16: Mean median, standard deviation and confidence interval for the domain social integration.

Age groups	Gender	N	Mean	Standard deviation (SD)	Median	95% Confidence Interval for mean	
Group 1	Male	10	98.80	3.795	100.00	96.08	101.51
	Female	10	83.40	14.025	82.50	73.36	93.43
Group 2	Male	10	90.60	12.176	97.50	81.88	99.31
	Female	10	89.00	14.368	96.50	78.72	99.27
Group 3	Male	10	93.60	6.569	95.00	88.90	98.29
	Female	10	91.40	10.102	95.50	84.17	98.62
Group 4	Male	10	92.80	13.079	100.00	83.44	102.15
	Female	10	92.60	8.113	92.50	86.79	98.40
Group 5	Male	10	87.10	17.432	97.00	74.63	99.57
	Female	10	67.00	19.944	62.00	52.73	81.26

Graph 12: Mean scores of social integration for males and females across each group.



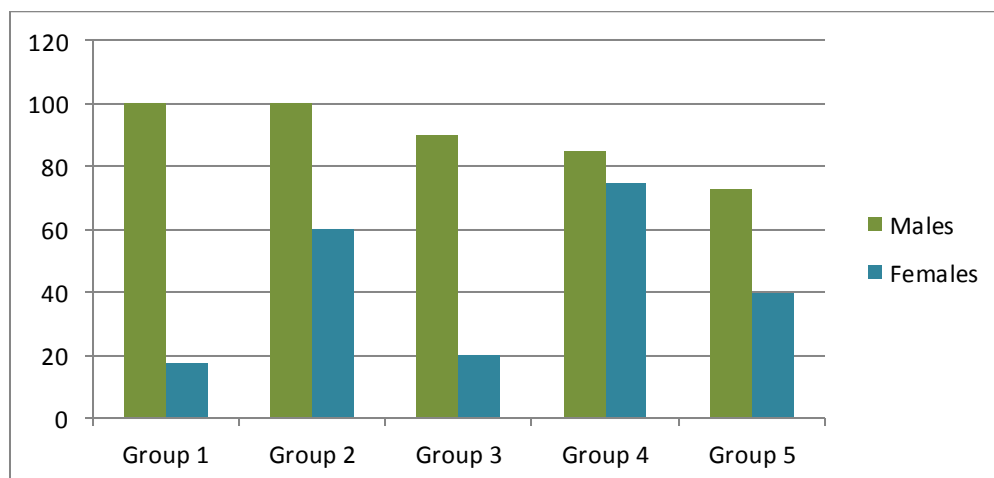
Similar to the domain cognitive independence, social integration showed increased mean scores for males than females in all the groups. Amongst females, group 5 has scored lesser mean scores than in other group.

f. Economic self-sufficiency:

Table 17: Mean median, standard deviation and confidence interval for the domain economic self-sufficiency.

Age groups	Gender	N	Mean	Standard deviation (SD)	Median	95% Confidence Interval for mean	
Group 1	Male	10	100.00	0.000	100.00	100	100
	Female	10	17.50	37.361	0.00	9	44.2
Group 2	Male	10	100.00	0.000	100.00	100	100
	Female	10	60.00	39.441	50.00	31.78	88.21
Group 3	Male	10	90.00	31.623	100.00	67.37	112.62
	Female	10	20.00	42.164	0.00	10.16	50.16
Group 4	Male	10	85.00	21.082	100.0	69.91	100.08
	Female	10	75.00	31.180	87.50	52.69	97.30
Group 5	Male	10	72.50	34.258	87.50	47.99	97
	Female	10	40.00	44.410	25.00	8.23	71.76

Graph 13: Mean scores for males and females for the domain economic self-sufficiency.



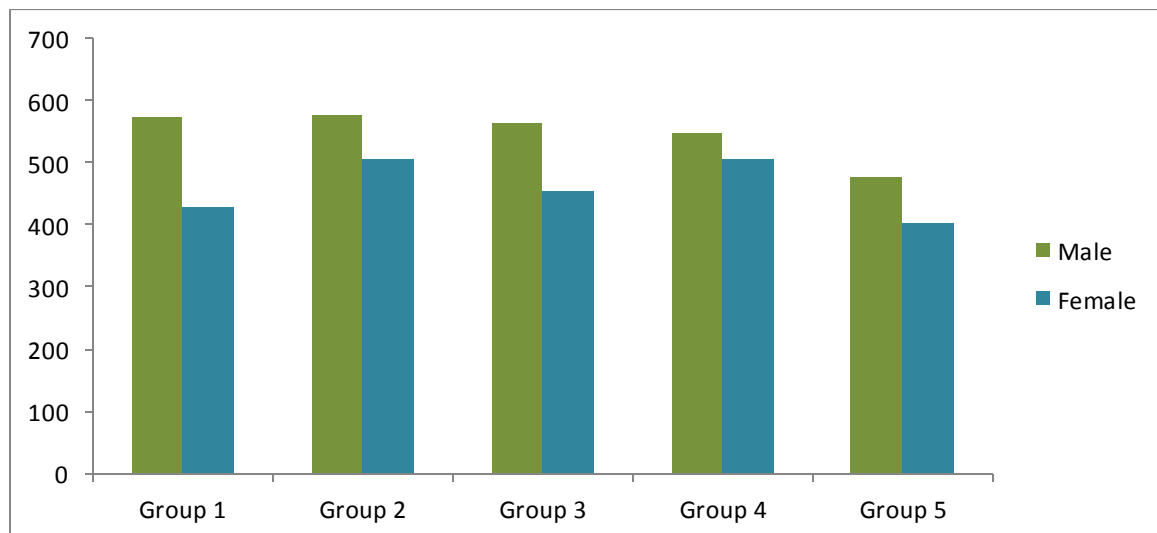
When males and females were compared for mean scores, in economic self-sufficiency the overall mean scores were higher for males. As age group increases the mean scores were reducing for males. But for females, the overall mean scores are reduced, and the lowest mean scores were observed in the group 1.

g. CHART-K total scores

Table 18: Mean SD and 95% confidence interval for total scores across gender for each group.

Age groups	Gender	Mean	Standard deviation (SD)	95% Confidence Interval for mean	
Group 1	Male	572.71	27.168	553.27	592.14
	Female	428.07	78.346	320.26	483.01
Group 2	Male	575.43	24.078	558.20	592.65
	Female	504.91	49.105	469.78	540.03
Group 3	Male	565.00	43.227	534.07	595.92
	Female	453.65	80.368	396.15	511.14
Group 4	Male	547.52	47.884	515.88	581.15
	Female	505.22	64.255	459.25	551.18
Group 5	Male	478.53	82.008	419.86	537.19
	Female	401.64	113.760	320.26	483.01

Graph 14: Total mean scores for each group across gender.



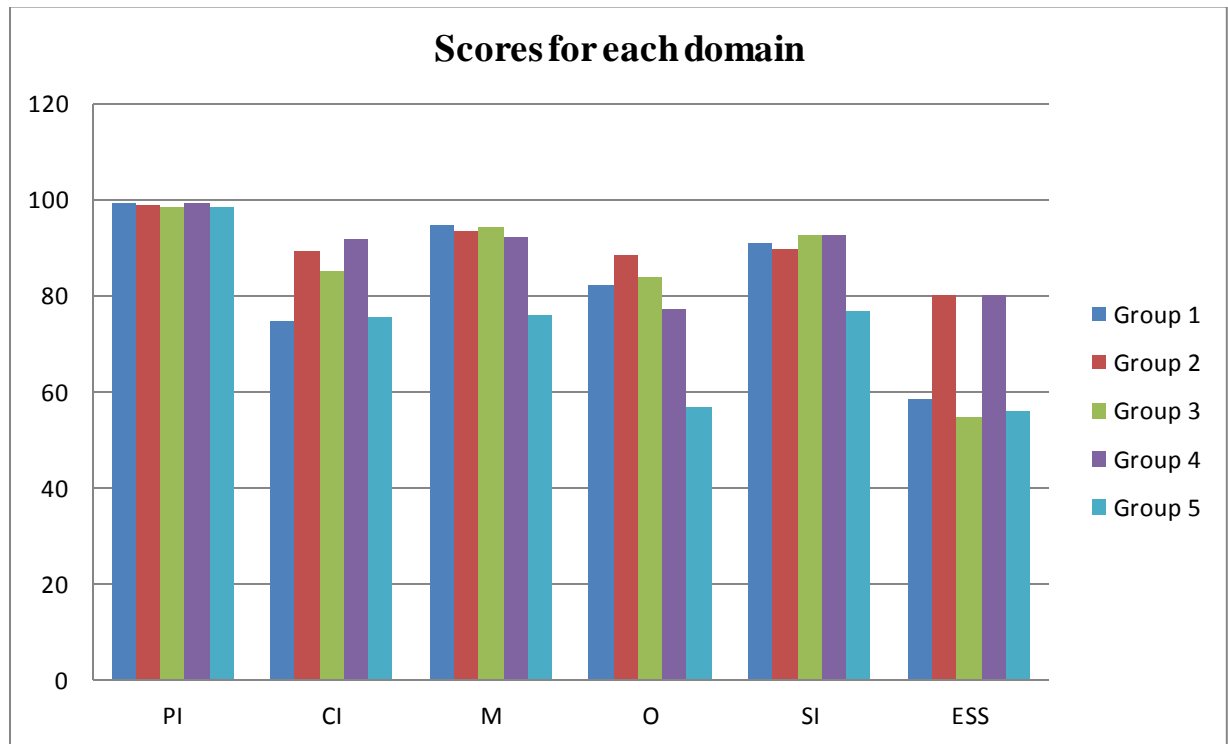
The total mean scores are observed across males and females for each age group. In males the higher mean scores are obtained than females in all the age groups.

h. Overall Comparison Of Performance Across Age Groups In Normal Individuals

Table 19: summarizes the Mean, SD and median for each domain across each group.

Age Group		PI	CI	M	O	SI	ESS	TS
Group 1	N	20	20	20	20	20	20	20
	Mean	99.241	74.850	94.700	82.250	91.100	58.750	500.891
	Std. Deviation	1.2080	19.8183	8.3041	24.2598	12.7440	49.5207	92.8910
	Median	100.000	78.000	100.000	99.000	100.000	100.000	547.900
Group 2	N	20	20	20	20	20	20	20
	Mean	98.770	89.250	93.650	88.700	89.800	80.000	540.170
	Std. Deviation	1.4283	10.8331	8.3368	16.7555	12.9883	34.0279	52.2065
	Median	99.550	91.000	98.500	100.000	96.500	100.000	554.350
Group 3	N	20	20	20	20	20	20	20
	Mean	98.500	85.000	94.200	84.125	92.500	55.000	509.325
	Std. Deviation	1.4622	19.9842	8.9065	20.1781	8.3697	51.0418	84.8970
	Median	98.250	98.000	100.000	95.500	95.000	100.000	557.350
Group 4	N	20	20	20	20	20	20	20
	Mean	99.145	91.750	92.100	77.175	92.700	80.000	526.870
	Std. Deviation	1.1601	12.2941	9.6458	24.1145	10.5934	26.4077	58.6101
	Median	100.000	100.000	94.000	85.000	98.000	100.000	544.250
Group 5	N	20	20	20	20	20	20	20
	Mean	98.510	75.500	76.000	56.775	77.050	56.250	440.085
	Std. Deviation	1.3090	22.3171	19.4639	32.6672	20.9447	42.0487	104.2671
	Median	98.750	70.000	68.000	52.500	75.500	50.000	488.450
Total	N	110	110	110	110	110	110	110
	Mean	98.247	80.136	88.436	72.314	86.473	62.273	486.788
	Std. Deviation	3.9520	22.3978	15.1630	31.7558	17.1334	43.7289	102.5471
	Median	99.450	87.000	96.000	80.000	94.000	100.000	515.000

Graph 15: Mean scores for each group across each domain of CHART-K.



As explained earlier, the mean scores are almost equal in all groups for the domain physical independence. Reduced mean scores are observed in the domain economic self-sufficiency for all the age groups.

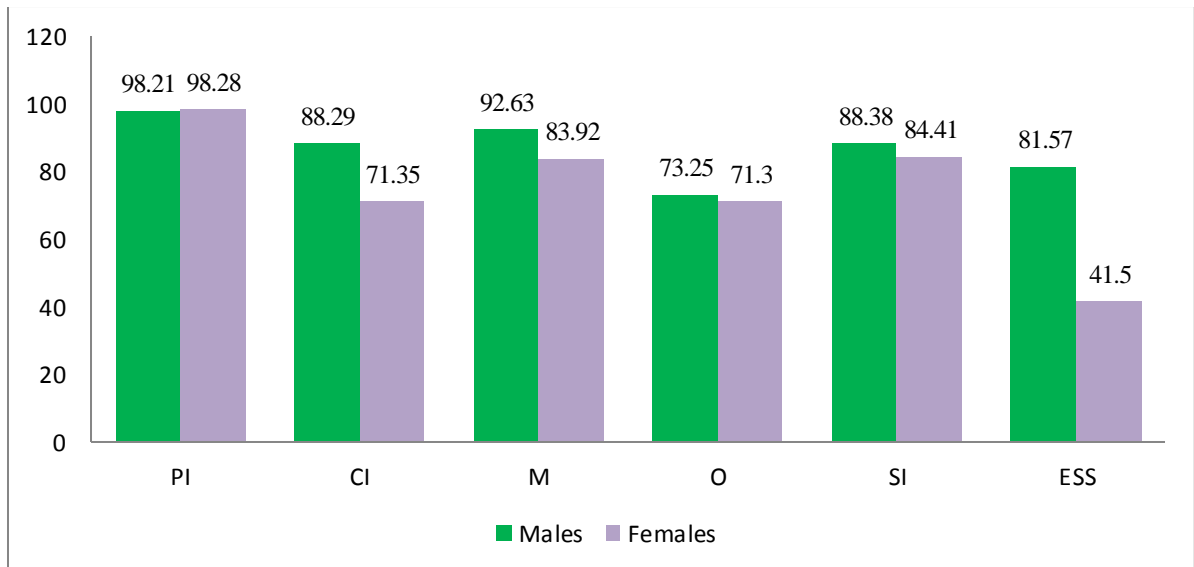
Group 1 has got higher mean scores in physical independence and mobility. Whereas, group 2 has secured higher mean scores in the domains occupation and economic self-sufficiency. Group 5 has obtained lower mean scores in all the domains of CHART-K.

i. Overall comparison of performance across gender

Table 20: Overall mean scores for each domain across gender has been provided in the table below.

Gender	PI	CI	M	O	SI	ESS	TS
Male	N	57	57	57	57	57	57
	Mean	98.210	88.298	92.632	73.254	88.386	81.579
	Std. Deviation	3.5564	20.4048	12.9486	32.5286	17.8163	34.2412
	Median	99.000	100.000	100.000	80.000	98.000	100.000
Female	N	53	53	53	53	53	53
	Mean	98.286	71.358	83.925	71.302	84.415	41.509
	Std. Deviation	4.3720	21.2513	16.1660	31.1819	16.2841	43.5623
	Median	99.600	72.000	88.000	80.000	90.000	25.000
Total	N	110	110	110	110	110	110
	Mean	98.247	80.136	88.436	72.314	86.473	62.273
	Std. Deviation	3.9520	22.3978	15.1630	31.7558	17.1334	43.7289
	Median	99.450	87.000	96.000	80.000	94.000	100.000

Graph 16: Mean scores of males and females across each domain.



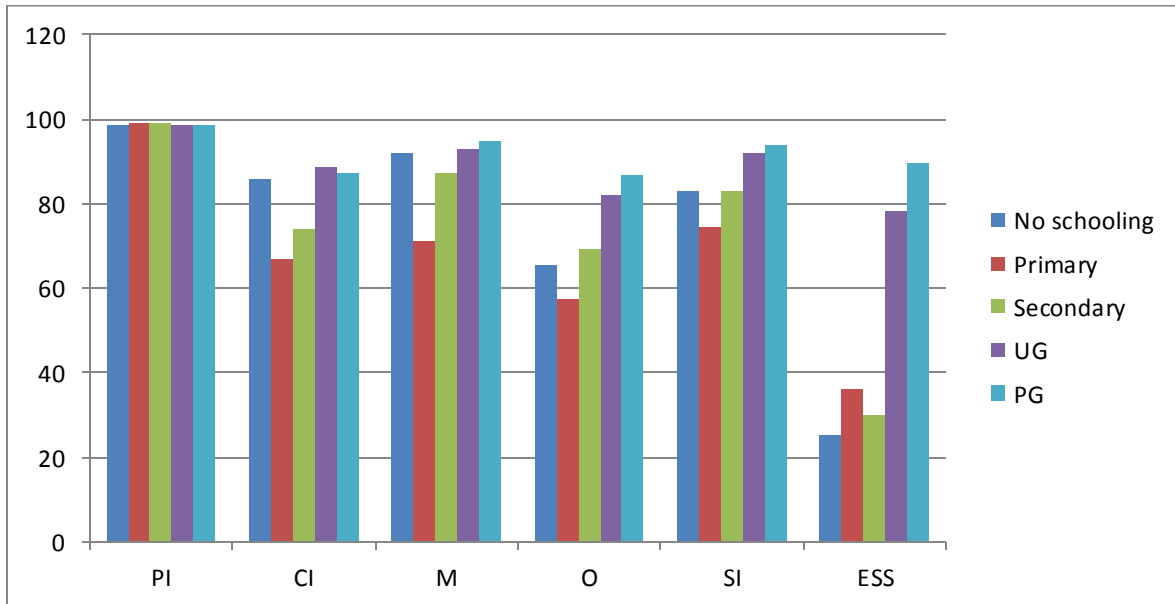
From the above table, the mean scores are increased for males than females for all the domains of CHART-K. And the difference of mean scores is observed to be more in cognitive independence and in economic self-sufficiency.

j. Performance of normal individuals across education

Table 21: Mean median, standard deviation (SD) and 95% confidence interval for mean across different domains of CHART-K with respect to education.

Education		PI	CI	M	O	SI	ESS	TS
No Schooling	N	2	2	2	2	2	2	2
	Mean	98.45	86.00	92.00	65.50	83.00	25.00	449.95
	Std. Deviation	2.192	19.799	7.071	48.790	11.314	35.355	87.752
	Median	98.45	86.00	92.00	65.50	83.00	25.00	449.95
primary	N	9	9	9	9	9	9	9
	Mean	99.24	66.89	71.00	57.56	74.33	36.11	405.13
	Std. Deviation	.693	18.169	16.248	28.585	20.316	39.747	94.446
	Median	99.40	66.00	66.00	52.00	75.00	25.00	421.50
secondary	N	21	21	21	21	21	21	21
	Mean	99.01	74.05	87.05	69.14	82.90	29.76	437.63
	Std. Deviation	1.283	23.179	13.159	26.536	17.785	39.226	82.093
	Median	99.90	75.00	92.00	63.00	88.00	.00	442.00
UG	N	44	44	44	44	44	44	44
	Mean	98.82	88.84	92.95	81.84	91.75	78.41	531.48
	Std. Deviation	1.321	15.027	10.441	26.371	11.795	37.584	71.024
	Median	99.30	100.00	100.00	99.00	99.00	100.00	558.40
PG	N	24	24	24	24	24	24	24
	Mean	98.58	87.04	94.67	86.60	93.75	89.58	550.22
	Std. Deviation	1.535	14.807	12.359	17.385	9.701	24.358	44.554
	Median	99.35	94.00	100.00	98.00	100.00	100.00	561.50
Total	N	100	100	100	100	100	100	100
	Mean	98.83	83.27	90.13	77.80	88.63	66.00	503.27
	Std. Deviation	1.329	18.655	13.548	26.208	14.754	42.420	86.874
	Median	99.55	91.00	97.00	90.50	96.00	100.00	529.85

Graph 17: Represents the mean scores for each domain across education levels.



The graph above clearly depicts the mean scores for each domain across education. From the above graph one can conclude that the mean scores are higher in all the domains for individuals who are post graduated. Further, the lower scores were observed for individuals who had no schooling and who had secured primary education.

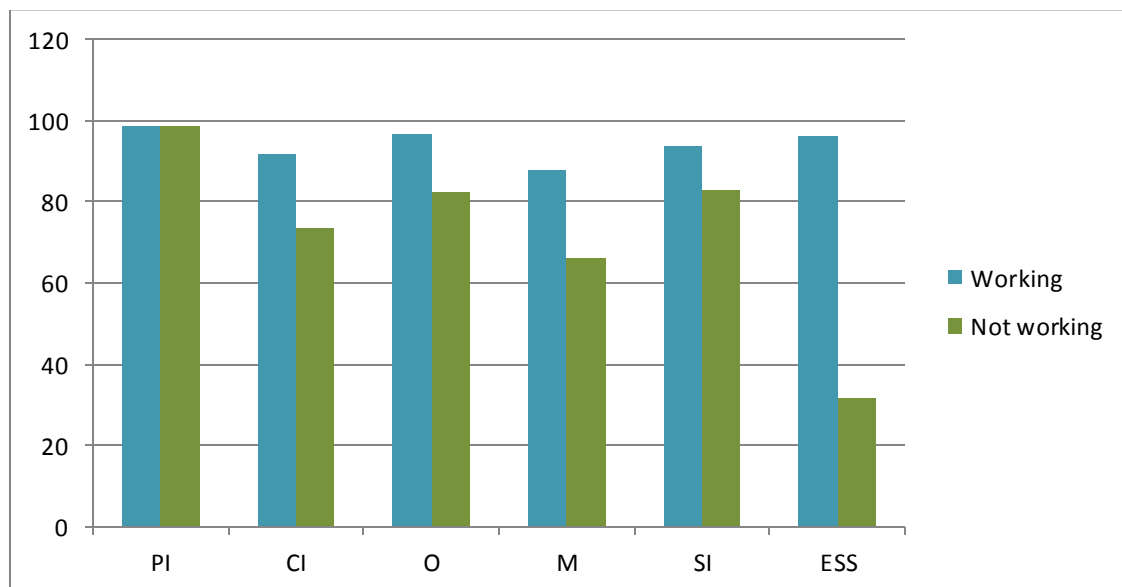
k. Performance of normal individuals across occupation

Individuals who are working have obtained higher mean scores in all the domains; whereas, individuals who are not working have obtained lower mean scores in all the domains. Among them, the lowest mean scores were observed in economic self-sufficiency.

Table 22: Mean, median, standard deviation (SD) and 95% Confidence Interval for mean across different domains of CHART-K with respect to occupation.

occupation		PI	CI	M	O	SI	ESS	TS
not working	N	47	47	47	47	47	47	47
	Mean	98.86	73.79	82.62	66.26	82.91	31.91	434.64
	Std. Deviation	1.314	20.617	15.707	29.421	17.161	38.555	77.597
	Median	99.50	72.00	87.00	70.00	88.00	.00	442.00
working	N	53	53	53	53	53	53	53
	Mean	98.81	91.68	96.79	88.05	93.70	96.23	564.12
	Std. Deviation	1.354	11.542	5.911	17.732	9.910	11.389	31.801
	Median	99.60	100.00	100.00	100.00	100.00	100.00	567.40
Total	N	100	100	100	100	100	100	100
	Mean	98.83	83.27	90.13	77.80	88.63	66.00	503.27
	Std. Deviation	1.329	18.655	13.548	26.208	14.754	42.420	86.874
	Median	99.55	91.00	97.00	90.50	96.00	100.00	529.85

Graph 18: depicts the mean scores for all the domains for individuals who are working and not working.



1. Comparing the difference between age groups, gender groups, education and occupation.

The present study included total of one hundred neuro-typical individuals age ranging from >25 to ≤75 years and they were divided into 5 groups. Each group included total of twenty participants with equal number of males and females.

Further, Kruskal Wallis and Mann-Whitney U tests were carried out to compare each age group, gender, education and occupation across each domain. The results are tabulated.

AGE GROUPS KRUSKAL WALLIS TEST

Table 23: Results of Kruskal Wallis test for group comparison.

	PI	CI	M	O	SI	ESS	TS
Chi-Square	7.301	13.432	14.620	15.548	9.294	5.399	11.885
p value	.121	.009**	.006**	.004**	.054*	.249	.018*

***p<0.05**

****p<0.01**

Kruskal Wallis results for age groups revealed significant difference in cognitive independence (P<0.001), motor (P<0.01), occupation (P<0.01), Social integration (P<0.05) and total scores (P<0.05). Further Mann-Whitney U test was done to compare between each group.

Table 24: Mean rank scores for each groups

Age Group	PI		CI		M		O		SI		ESS		TS	
	N	Mean Rank	N	Mean Rank	N	Mean Rank	N	Mean Rank	N	Mean Rank	N	Mean Rank	N	Mean Rank
Group 1	20	59.68	20	36.75	20	59.10	20	55.53	20	56.25	20	47.28	20	51.33
Group 2	20	49.78	20	56.73	20	54.88	20	62.00	20	51.40	20	59.15	20	60.58
Group 3	20	44.35	20	54.23	20	57.63	20	56.83	20	54.23	20	45.78	20	53.33
Group 4	20	58.35	20	64.23	20	50.68	20	47.65	20	56.58	20	56.40	20	55.83
Group 5	20	40.35	20	40.58	20	30.23	20	30.50	20	34.05	20	43.90	20	31.45

Table 25: Results of Mann-Whitney U Test

Groups	CI		M		O		SI		TS	
	Z-Value	P-Value	Z-Value	P-Value	Z-Value	P-Value	Z-Value	P-Value	Z-Value	P-Value
1 Vs 2	2.340	0.019*	0.548	0.583	0.711	0.477	0.629	0.529	0.920	0.358
1 Vs 3	1.859	0.063	0.211	0.833	0.188	0.851	0.205	0.838	0.140	0.889
1 Vs 4	3.093	0.002**	1.070	0.284	0.958	0.338	0.030	0.976	0.998	0.318
1 Vs 5	0.314	0.754	3.084	0.002**	2.671	0.008**	2.464	0.014*	0.219	0.827
2 Vs 3	0.114	0.910	0.366	0.714	0.667	0.505	0.341	0.733	1.515	0.130
2 Vs 4	0.951	0.342	0.539	0.590	1.703	0.089	0.573	0.567	0.531	0.595
2 Vs 5	1.869	0.062	2.767	0.006**	3.446	0.001**	1.979	0.048*	1.941	0.052*
3 Vs 4	1.127	0.260	0.902	0.367	1.155	0.248	0.429	0.668	1.209	0.227
3 Vs 5	1.358	0.174	2.951	0.003**	2.795	0.005**	2.337	0.019*	0.044	0.965
4 Vs 5	2.694	0.007**	2.506	0.012*	2.113	0.035*	2.377	0.017*	1.756	0.079

P<0.05***P<0.01**

Mann-Whitney U test results revealed that, there is a significant difference between age group 1 (>25 to ≤35years) and age group 2 (>35 to ≤45 years) in cognitive independence $p<0.05$. Where, group 2 (56.73) had higher mean ranks than group 1(36.75). Further, significant difference was found between age group 1 (>25 to ≤35years) and age

group 4 (>55 to ≤65 Years) in cognitive independence $p<0.01$. Similarly, statistically Significant difference between age group 1 (>25 to ≤35years) and age group 5 (>65 to ≤75 years) was found in mobility ($p<0.01$), occupation ($p<0.01$) and social integration ($p<0.05$). Meanwhile, significant difference found between age groups 2 (>35 to ≤45 years) and age group 5 (>65 to ≤75 years) in mobility ($p<0.01$), occupation ($p<0.01$), social integration ($p<0.05$) and in Chart total scores ($p<0.05$).

Further, Significant differences obtained between age group 3 (>45 to ≤55 years) and age group 5 (>65 to ≤75 years) in mobility ($p<0.01$), occupation ($p<0.01$) and in social integration ($p<0.05$). Also, statistically significant difference found for the age group 4 (>55 to ≤65 years) and age group 5 (>65 to ≤75 years) for cognitive independence ($p<0.01$), mobility ($p<0.05$), occupation ($p<0.05$) and social integration ($p<0.05$).

Mann-Whitney Test For Gender Difference

Table 26: Results of Mann-Whitney U test for gender difference

	PI	CI	M	O	SI	ESS	TS
Z	0.517	5.154	4.613	0.960	2.640	5.468	5.484
p-value	0.605	0.000**	0.000**	0.337	0.008**	0.000**	0.000**

* $P<0.05$

** $P<0.01$

Table 27: Mean rank for gender across domains of CHART-K

Gender		PI	CI	M	O	SI	ESS	TS
Male	N	50	50	50	50	50	50	50
	Mean Rank	64.85	64.96	63.21	53.18	57.80	64.85	66.41
Female	N	50	50	50	50	50	50	50
	Mean Rank	36.15	36.04	37.79	47.82	43.20	36.15	34.59

Mann-Whitney U test results revealed that, there is a significant difference between males and females in cognitive independence, mobility, social integration, economic self-sufficiency and in CHART-K total scores. Males have obtained higher mean rank than females in cognitive independence, mobility, social integration, economic self-sufficiency and in CHART-K total.

Kruskal Wallis Test for Education Difference

Further to check the significant difference across education, Kruskal Wallis test was administered.

Table 28: Kruskal Wallis test results for difference between education levels.

	PI	CI	M	O	SI	ESS	TS
Chi-Square	2.180	13.063	27.751	13.567	13.865	32.967	31.736
p-value	.703	.011*	.000**	.009**	.008**	.000**	.000**

***P<0.05**

****P<0.01**

Kruskal Wallis test results revealed that, there is a significant difference between education levels in cognitive independence, mobility, occupation, social integration, economic self-sufficiency and in total CHART-K scores.

Table 29: Mean rank scores for education level for each domain

Education	PI		CI		M		O		SI		ESS		TS	
	N	Mean Rank	N	Mean Rank	N	Mean Rank	N	Mean Rank	N	Mean Rank	N	Mean Rank	N	Mean Rank
No Schooling	2	47.25	2	54.25	2	41.00	2	43.25	2	31.75	2	23.25	2	29.50
Primary	9	53.00	9	27.11	9	17.17	9	29.28	9	29.33	9	33.00	9	21.28
Secondary	21	54.83	21	38.90	21	39.14	21	41.14	21	40.95	21	27.74	21	28.43
UG	44	50.15	44	58.78	44	56.15	44	55.67	44	55.25	44	58.44	44	60.13
PG	24	46.69	24	53.92	24	63.38	24	57.77	24	59.65	24	64.69	24	64.88

Table 30: Results of Mann-Whitney test for education level

Education	CI		M		O		SI		ESS		TS	
	Z-	P-	Z-	P-	Z-	P-	Z-	P-	Z-	P-	Z-	P-
	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value	Value
No Schooling Vs primary	1.378	0.168	1.736	0.082	0.824	0.410	0.920	0.358	0.098	0.922	0.913	0.361
No Schooling Vs Secondary	0.775	0.438	0.330	0.742	0.279	0.780	0.166	0.868	0.061	0.952	0.218	0.827
No Schooling Vs Under Graduation	0.050	0.960	0.454	0.650	0.100	0.921	1.021	0.307	1.703	0.089	0.999	0.318
No Schooling Vs Post Graduation	0.000	1.000	1.711	0.087	0.589	0.556	1.447	0.148	2.70	0.007**	1.852	0.064
Primary Vs Secondary	1.318	0.187	3.019	0.003**	2.243	0.025*	1.686	0.092	0.041	0.967	1.871	0.061
Primary Vs Under Graduation	3.030	0.002**	4.092	0.000**	2.662	0.008**	2.895	0.004**	2.976	0.003**	3.653	0.000**
Primary Vs Post Graduation	3.215	0.001**	4.381	0.000**	3.485	0.000**	3.250	0.001**	4.108	0.000**	4.364	0.000**
Secondary Vs Under Graduation	1.756	0.079	0.638	0.101	0.953	0.341	1.468	0.12	3.700	0.000**	3.005	0.003**
Secondary Vs Post Graduation	1.830	0.067	3.238	0.001**	2.288	0.022*	2.017	0.044*	4.698	0.000**	4.455	0.000**
Under Graduation Vs Post Graduation	0.023	0.981	1.847	0.065	1.163	0.245	0.845	0.398	1.778	0.075	1.326	0.185

***P<0.05**

****P<0.01**

Mann-Whitney U test was conducted to check the difference between education levels in each domain. Mann-Whitney U test results revealed that, there is a significant difference between individuals who had no schooling and individuals who had post-graduation in economic self-sufficiency $p < 0.01$.

Further, Significant difference was observed between individuals who had primary education and individuals with secondary education in mobility $p < 0.01$ and occupation $p < 0.05$. Also, statistically significant difference in cognitive independence, mobility, occupation, social integration, economic self-sufficiency and total CHART-K scores between individuals who had primary education and under graduation. Similar results found between individuals having primary education and post-graduation education level.

Individuals with secondary education and under-graduation level had a significant difference in economic self-sufficiency and total CHART-K scores. Further, Significant differences obtained between secondary education and post-graduation in all the domains of CHART-K except physical independence and cognitive independence.

Table 31: Mann-Whitney Test results for Occupation Difference

	PI	CI	M	O	SI	ESS	TS
Z	.204	-.617	5.494	4.128	3.482	7.577	7.683
p-value	.839	.000**	.000**	.000**	.000**	.000**	.000**

***P<0.05**

****P<0.01**

Further, Mann-Whitney test was administered to check the difference between occupations across each domain of CHART-K.

Table 32: Mean ranks for occupation across each domain.

occupation		PI	CI	M	O	SI	ESS	TS
not working	N	47	47	47	47	47	47	47
	Mean Rank	49.89	36.74	34.43	38.27	40.28	29.38	26.83
working	N	53	53	53	53	53	53	53
	Mean Rank	51.04	62.70	64.75	61.35	59.57	69.23	71.49

Results revealed that, there is a significant difference between individuals who are working and who are not working in all domains of CHART-K except physical independence. Mean rank of individuals who work is higher than individuals who are not working in all the domains of CHART-K.

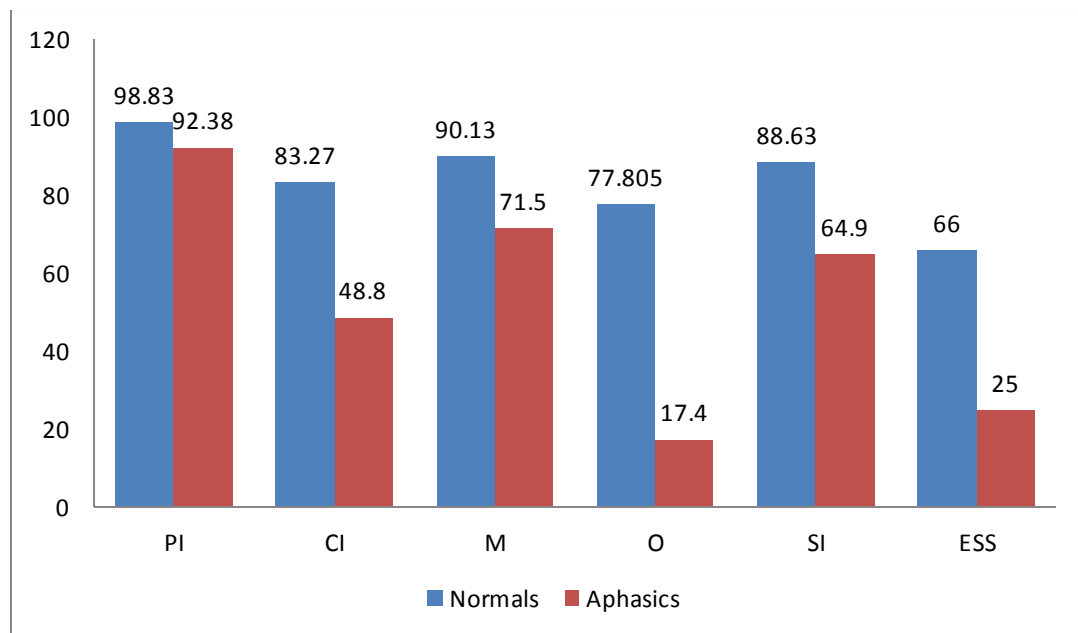
m. Comparison of normal individuals and persons with aphasia across various domains of CHART-K.

Further, the mean scores obtained for the neuro-typical group was compared with the group including individuals with aphasia.

Table 33: Mean SD and median for each domain across normal and individuals with aphasia.

Groups	PI	CI	M	O	SI	ESS	TS
Normal	N	100	100	100	100	100	100
	Mean	98.833	83.270	90.130	77.805	88.630	66.000
	Std. Deviation	1.3291	18.6552	13.5480	26.2078	14.7543	42.4205
	Median	99.550	91.000	97.000	90.500	96.000	100.000
Aphasics	N	10	10	10	10	10	10
	Mean	92.384	48.800	71.500	17.400	64.900	25.000
	Std. Deviation	11.3009	32.3618	20.3702	31.1812	24.3285	40.8248
	Median	97.835	31.000	76.000	3.500	70.000	.000

Graph 19: Mean scores for neuro-typical individuals and individuals with aphasia.



The graph above represents the mean scores for each domain across neuro-typical and individuals with aphasia. From the graph it is clear that, the mean scores for individuals with aphasia are far below in all the domains of CHART-K when compared with neuro-typical individuals.

n. Comparison of domains of CHART-K between various types of aphasia.

Table 34: Scores of PWA 1 of aged 44years Male with anomic aphasia compared with 95% confidence interval for of their age and gender matched neuro-typical individual.

Domains	Anomic aphasia	Neuro typical	
		95% confidence interval for mean	
PI	99.6	97.96	99.69
CI	96	87.67	100
M	100	94.81	101.58
O	100	87.41	100.18
SI	65	81.88	99.31
ESS	100	100	100
TS	560.6	558.20	592.65

Table 35: Scores of PWA 2 of aged 50years Male with global aphasia compared with 95% confidence interval for of their age and gender matched neuro-typical individual.

Domains	Global aphasia	Neuro typical	
		95% confidence interval for mean	
PI	96.67	97.23	99.16
CI	82	97.39	101.01
M	83	92.49	102.90
O	2	75.77	96.82
SI	70	88.90	98.29
ESS	0	67.37	112.62
TS	333.67	534.07	595.92

Table 36: Scores of PWA 3 of aged 56years Male with anomic aphasia compared with 95% confidence interval for of their age and gender matched neuro-typical individual.

Domains	Anomic aphasia	Neuro typical	
		95% confidence interval for mean	
PI	99.8	98.39	100
CI	86	100	100
M	77	91.45	100.74
O	0	65.50	95.29
SI	23	83.44	102.15
ESS	75	69.91	100.08
TS	360.8	515.88	581.15

Table 37: Scores of PWA 4 of aged 53years Male with global aphasia compared with 95% confidence interval for of their age and gender matched neuro-typical individual.

Domains	Global	Neuro typical	
	Aphasia	95% confidence interval for mean	
PI	90.5	97.23	99.16
CI	6	97.39	101.01
M	70	92.49	102.90
O	1	75.77	96.82
SI	90	88.90	98.29
ESS	0	67.37	112.62
TS	257.5	534.07	595.92

Table 38: Scores of PWA 5 of aged 50years Male with global aphasia compared with 95% confidence interval for of their age and gender matched neuro-typical individual.

Domains	Global	Neuro typical	
	Aphasia	95% confidence interval for mean	
PI	75	97.23	99.16
CI	22	97.39	101.01
M	39	92.49	102.90
O	0	75.77	96.82
SI	55	88.90	98.29
ESS	0	67.37	112.62
TS	191	534.07	595.92

Table 39: Scores of PWA 6 of aged 27years female with Conduction aphasia compared with 95% confidence interval for of their age and gender matched neuro-typical individual.

Domains	Conduction aphasia	Neuro typical	
		95% confidence interval for mean	
PI	100	98.49	100
CI	76	49.42	77.77
M	68	85.62	99.77
O	30	51.80	93.39
SI	28	73.36	93.43
ESS	0	9	44.2
TS	302	320.26	483.01

Table 40: Scores of PWA 7 of aged 32years female with Broca's aphasia compared with 95% confidence interval for of their age and gender matched neuro-typical individual.

Domains	Broca's aphasia	Neuro typical	
		95% confidence interval for mean	
PI	99	98.49	100
CI	32	49.42	77.77
M	80	85.62	99.77
O	28	51.80	93.39
SI	78	73.36	93.43
ESS	0	9	44.2
TS	317	320.26	483.01

Table 41: Scores of PWA 8 of aged 40years female with Broca’s aphasia compared with 95% confidence interval for of their age and gender matched neuro-typical individual.

Domains	Broca’s aphasia	Neuro typical	
		95% confidence interval for mean	
PI	68.8	97.50	99.91
CI	30	76.68	92.31
M	35	82.76	95.43
O	0	68.33	98.86
SI	70	78.72	99.27
ESS	0	31.78	88.21
TS	203.8	469.78	540.03

Table 42: Scores of PWA 9 of aged 25years Male with anomic aphasia compared with 95% confidence interval for of their age and gender matched neuro-typical individual.

Domains	Anomic aphasia	Neuro typical	
		95% confidence interval for mean	
PI	94.67	98.22	100
CI	28	77.18	95.01
M	75	92.23	101.16
O	8	82.02	101.78
SI	100	96.08	101.51
ESS	0	100	100
TS	305.67	553.27	592.14

Table 43: Scores of PWA 10 of aged 60years female with Broca’s aphasia compared with 95% confidence interval for of their age and gender matched neuro-typical individual.

Domains	Broca’s aphasia	Neuro typical	
		95% confidence interval for mean	
PI	99.8	98.19	99.94
CI	30	74.23	92.76
M	88	80.30	95.89
O	5	54.08	93.81
SI	70	86.79	98.40
ESS	75	52.69	97.30
TS	367.8	459.25	551.18

Table 44: Mean SD and median for each domain across various types of aphasia.

Type of Aphasia		PI	CI	M	O	SI	ESS
Global	N	3	3	3	3	3	3
	Mean	87.390	36.667	64.000	1.000	71.667	.000
	Std. Deviation	11.1647	40.0666	22.6053	1.0000	17.5594	.0000
	Median	90.500	22.000	70.000	1.000	70.000	.000
Broca	N	3	3	3	3	3	3
	Mean	89.200	30.667	67.667	11.000	72.667	25.000
	Std. Deviation	17.6714	1.1547	28.5715	14.9332	4.6188	43.3013
	Median	99.000	30.000	80.000	5.000	70.000	.000
Anomic	N	3	3	3	3	3	3
	Mean	98.023	70.000	84.000	36.000	62.667	58.333
	Std. Deviation	2.9058	36.7151	13.8924	55.5698	38.5530	52.0416
	Median	99.600	86.000	77.000	8.000	65.000	75.000
conduction	N	1	1	1	1	1	1
	Mean	100.000	76.000	68.000	30.000	28.000	.000
	Std. Deviation
	Median	100.000	76.000	68.000	30.000	28.000	.000

From the table it is clear that, persons with global aphasia have higher level of handicap in physical independence, mobility, occupation, and economic self-sufficiency than other type of aphasia. The results obtained in the present study are discussed in chapter V.

CHAPTER V

DISCUSSION

The present study aimed at adapting Craig Handicap Assessment and Reporting Technique (CHART) to the Kannada language. The study included a total of 100 neuro-typical individuals and ten individuals with aphasia. Neuro-typical individuals were divided into five groups; each group included an equal number of males and females. The age range of the neuro-typical individuals is between >25 years to ≤ 75 years. The participants were divided into five groups with equal age interval.

Craig Handicap Assessment and Reporting Technique (CHART)- Kannada includes a total of 33 questions divided into six major domains, namely; physical independence, cognitive independence, mobility, occupation, social integration, and economic self-sufficiency. In each domain, the age groups, gender, education, and occupation were compared for neuro-typical individuals. Later, the obtained scores were compared with individuals having aphasia to check the level of handicap among them with respect to their age, gender, and type of aphasia.

➤ Physical independence

Following conclusions can be drawn from the results obtained for the physical independence domain.

- As age increases, physical independence decreases. Older individuals are having lesser physical independence.
- Physical independence is highly variable amongst males and females.

- Individuals with aphasia had lesser physical independence than neuro-typical individuals. Among aphasics, individuals with global aphasia were more dependent for physical assistance than other types of aphasia.

It is reported that individuals above 65 years have various medical conditions like arthritis, hypertension, diabetes, etc. as a result they will not be either allowed or not able to assist their family members in various household activities including grocery shopping, housekeeping etc. In the Indian context, older individuals are provided with respect and care. Hence, they may not be allowed to do any of the household activities, rather they will be asked to use their wisdom in providing support and guidance for the family. Hence, the older age group has poorer physical independence when compared to the other age groups. Elderly individuals who are living in a community have difficulty in physical functions. Similar results were reported by Castaneda-Sceppa et al., (2010) and National Health survey, (1977)

Among males and females, females have higher physical independence than males in group 1 (>25 years to \leq 35 years), group 3(>45 years to \leq 55 years) and in group 5 (>65 years to \leq 75 years). Females in these groups were homemakers and were more involved in housekeeping, laundry and grocery shopping than males. Whereas, females in the group 2 (>35 years to \leq 45 years) and in group 4 (>55 years to \leq 65 years) have poor physical independence than males. Because, in these groups females were working and they had lesser time to spend in housekeeping, grocery shopping etc. Among males, group 3 (>45 years to \leq 55 years) males were physically more dependent on assistance. Males in group 3 (>45 years to \leq 55 years) had the responsibility to take care of their

family members and to settle down in their profession and personal life. Hence, they were not much involved in the household, housekeeping activities.

Aphasia caused due to various conditions like stroke, TBI, tumor etc. is usually associated with motor deficits ranging from weakness, paresis, and paralysis. Persons with aphasia exhibit more dependency on physical activities. Dependency also depends on the type of aphasia, cause of aphasia, age of an individual, the severity of aphasia etc. individuals who have a severe form of aphasia caused due to stroke were more dependent on family members or spouse for personal care and physical independence. Hence, handicap was observed more in aphasia group when compared to neuro-typical individuals. Among aphasics, individuals having global aphasia had higher handicap followed by Broca's aphasia, anomia aphasia, and conduction aphasia. Individuals with global aphasia had lesser post-stroke duration and they had just started physiotherapy and occupational therapy hence, individuals in this group were more handicapped. Persons with Broca's aphasia were having a longer post-stroke duration; they were attending occupation therapy and physiotherapy for a long time which results in reduced handicap level compared to global aphasia.

➤ **Cognitive independence**

Results obtained for the domain cognitive independence can be summarized as;

- Individuals age ranging from >25 years to ≤35 years had poor cognitive independence and higher independence was observed in individuals age ranging between >55 years to ≤65 years.

- Males have better cognitive independence than females. As age increases cognitive independence also increases but reduces at the age of >65 years.
- When compared to neuro-typical individuals, persons with aphasia had poor cognitive independence. Among aphasics, poor cognitive independence was observed in individuals with Broca's aphasia followed by global aphasia.

In Indian context, younger population are more protected by elder where they are provided with less opportunities which makes them depend more on the older population in making decisions. Hence, younger individuals exhibited poor cognitive independence than older age group. Generally, individuals above 55 years of age were the head of the family and they use to take care of the family related decisions and they tend to manage the family with economic support hence, individuals in this group have obtained higher cognitive independence. Further, the psychological well-being of an individual majorly depends on their involvement in work and volunteering. This was supported by Matz-costa, Besen, James, & Pitt-catsoupes, (2018).

In gender, a trend was observed in cognitive independence domain for males. As age increases the cognitive independence also increases but in group 5 (>65 years to ≤ 75 years) it is reduced. In the Indian context, as age increases, individuals are matured and can take decisions on their own but after the age of 65 years, individuals have the fear of security and their health, and hence care will be taken by their family members.

In all the groups, females had poorer cognitive independence when compared to males. Among females, group 1 had poor cognitive independence than females of the

other groups. Most of the females in the age range >25 years to ≤ 35 years were studying or married. They were more dependent on their parents or spouse for decision making. Hence, poor cognitive independence was found.

When a person has aphasia due to the presence of other associated problems like loss of speech and language, motor difficulty, cognitive difficulties person need more care and support from the family members. After acquiring aphasia person fails to take all the responsibilities. If a person was the head of the family then they alone cannot make decisions for themselves and for the entire family hence, they depend on the other family members for making decisions which resulted in handicap.

➤ **Mobility**

Following conclusions can be drawn in the mobility domain:

- As age increases irrespective of gender independence in mobility reduces.
- Individuals with aphasia had comparatively poor independence in mobility when compared with neuro-typical individuals. Individuals with global aphasia exhibited poor mobility followed by Broca's aphasia, conduction aphasia, and anomic aphasia.

As age increases, most of the individuals in age range >65 years to ≤ 75 years have fear of fall, reduced muscle strength and associated with other medical conditions such as arthritis, hypertension, diabetes, asthma, etc. and they are not able to look after their transportation on their own rather they depend more on assistance for the same. As discussed in physical independence domain, all the family members pay more attention towards older population for providing extra care and help in the Indian scenario. Hence,

they will be always provided with assistance by the family members. As age increases the mobility is reducing and the dependency is increasing. From the trend obtained it can be concluded that as age increases people tend to depend more on an assistance for mobility. Poor mobility is observed in group 5 for both males and females. Younger population is more independent and can use automobiles hence; they are more independent in terms of mobility. Older individuals are more heterogeneous and as age increases, they are different from each other resulting in varied features (Bleich, Boro, & Rowe, 1997).

After stroke due to the presence of motor difficulties individual fails to use transportation systems, and the person needs few assistive devices like a wheelchair, walking stick etc. hence, they cannot be independent in mobility like other neuro-typical individuals. But, the family, and friends support has a very good influence and plays an important role in modulating the impact of the disorder (Gilford, 1988).

➤ **Occupation**

The main key points to summarize the results of occupation are;

- Independence in occupation increases from 25 years to 35 years following which it starts decreasing with increased age.
- When gender is considered as a variable, males had higher independence in occupation than females.
- Persons with aphasia are highly dependent on occupation support than neuro-typical individuals. Individuals with global aphasia are lesser independent in occupation followed by Broca's aphasia, conduction aphasia, and anomic aphasia.

Occupation is highly variable, after completing the education, i.e. around 20-25 years of age; most of the individuals start working. Many individuals will not get the job opportunities immediately after completing the education in India as there is a lot of unemployment due to the high population. Hence, they have obtained low occupation scores than individuals in age groups 2 and 3. At the age of 60 people tend to get retired from their occupation. But few of them will be able to work like volunteering, gardening, completing their hobbies etc. Hence, individuals in the age group 4 have obtained better occupation scores than individuals in the age group 6.

When males and females were compared across different age groups, it was observed that in each group males were more independent in working than females. Except in group 5 where females were more independent in working than males. In group 5 females are more involved in household activities, housekeeping, home improvement and gardening etc. Individuals who were not working are satisfied with their family, friends, and leisure time (Ginn & Fast, 2015).

Most of the individuals who were working had left their job after acquiring aphasia, which resulted in an increased dependency on others for occupation assistance. After the condition persons with aphasia were not able to be independent both physically and cognitively this led them to depend more on assistance.

➤ **Social integration**

The findings of social integration can be summarized as;

- Individuals above age 65 years exhibited poor social integration.
- Across gender, males had higher social integration than females.

- A person with aphasia had poor social integration than neuro-typical individuals. Individuals with conduction aphasia had poor social integration compared to other types of aphasia.

Individuals in all the age groups had good social integration except group 5. As observed, individuals between age range >65 years to ≤ 75 years were not spending much time in using communication systems like phone, letter, mail and other social media. Also, they do not spend much time in talking to strangers and few of them had less number of friends and colleagues when compared to other age groups. Social integration also depends on individual's lifestyle, environment, education, occupation etc. Hence, social integration is poor in older populations when compared to younger once. Individuals who are younger, functionally independent and healthier are more socially integrated. In the older population, limited mobility and poor health condition will result in poor social integration. This was supported by Vitman, Iecovich, & Alfasi, (2014) also retirement can result in reduced social integration. Similar results were obtained in a study conducted by Drentea, (2002)

Higher independence in social integration was present in males than females in all age groups. Among males, group 1 individuals are more socially integrated. Because younger people are socially more active and they tend to build rapport more quickly with friends, family members, colleagues and with strangers hence, they have higher independence in social integration than males in other groups. Among females, group 5 had less independence in social integration. Most of the females in this group were homemakers and were not having many friends to communicate and were not speaking with strangers. Hence, they had poor social integration than females in the other age

groups. For middle-aged women conflict between work and spending more time with family led no time to spend with friends resulted in reduced social integration (Ginn & Fast, 2015)

Social integration can be affected by a person's environment, age, medical condition, the reaction of others for the condition, support from the family members and others etc. in persons with aphasia, after the condition most of the individuals will be depressed and aggressive about their condition. It will be very difficult to accept the condition by the person and by the family members, which creates a mental block for the person to get integrated into the society.

➤ **Economic self-sufficiency**

Following conclusions can be drawn from the obtained results;

- Economic self-sufficiency is highly variable across age.
- When compared to gender, males have higher independence than females. Among males as age increases independence in economic self-sufficiency reduces.
- Individuals with aphasia are more dependent on others for economic support than neuro-typical individuals. Persons with global and conduction aphasia had lesser economic independence followed by Broca's aphasia and anomic aphasia.

Individuals with the age range of >45 years to ≤55 years have poor economic self-sufficiency followed by group 5 and group 1. Individuals in group 2 and group 4 are economically more independent when compared to the other group. Most of the

individuals in these groups were working and had taken economic responsibilities of their family. Hence, higher scores for economic self-sufficiency were obtained in these groups. Individuals above 65years are more dependent only on the sources like pension, and property income for economic support (Gilford, 1988).

A trend was obtained for males in this domain. As age increases, the independence in economic self-sufficiency was decreasing. But in females, no trend was observed. In every group, it was found that males have higher independence in economic self-sufficiency than females. In group 1 and group 2 males were working and they were economically more independent than females. In females, group 1 and group 3 individuals are more dependent on assistance for economic support. In group 1 females were not working hence, they had more dependency on either parents or spouse for economic support. In group 3 most of the females were homemakers and they did not have a source of income. Hence, they were dependent on their spouse for economic support.

In individuals with aphasia, immediately after stroke or TBI, they tend to take a leave or quite from their job. They depend more on their family for economic support. Most of individuals in aphasia group were working, and they quit the job after the condition which resulted in an increased dependency on others for economic assistance.

➤ **CHART-K total scores**

To summarize,

- Individuals above the age of 65 years had more dependency in all the domains of CHART-K.

- In all the domains males have higher independence than females.
- Poor independence was obtained for individuals with aphasia in all the domains of CHART-K.

The overall CHART-K scores were compared across groups, where, the sum of all totals of the domains was combined. The overall performance was poor in group 5 i.e. individuals age ranging from >65 years to ≤75 years. From the results, it is clearly shown that the performance of individuals in group 5 is poor in most of the domains of CHART-K when compared to individuals in the other groups. Older population exhibited poor performance in physical independence, cognitive independence, mobility, occupation, social integration and in economic self-sufficiency. The dependency ratio for the older population is reported to be increased compared to younger once (Gilford, 1988). Older individuals are more heterogeneous and as age increases, they are different from each other resulting in varied features (Bleich et al., 1997). It has been also reported that when domains like family, friends, income, health, and work etc. older people are not satisfied much with their lives as in younger once (Andrews, 1986). Hence, the overall performance of individuals above age 65 years has reduced.

The overall CHART-K scores were compared across males and females in each age group. In males, the total mean scores were almost similar for the age group 1, 2 and 3 but it starts reducing from group 4 to 5. More dependency was seen in group 5 when compared to all other age groups. Among females, individuals in group 5 are more dependent followed by group 1 than other age groups. Individuals with aphasia had poor independence in all the domains of CHART-K resulting in reduced overall performance and increased handicap in them

CHAPTER VI

SUMMARY AND CONCLUSION

The present study was intended to adapt and validate Craig Handicap Assessment and Reporting Technique (CHART) (Whiteneck, Brooks, Charlifue, Gerhart, Mellick, & Overholser, 2001) in Kannada language. The basis to develop CHART in Kannada is the facts that, there are very few attempts have been made to adapt and validate CHART on neuro-typical individuals in the Indian context. Hence, the present study aimed at adapting the CHART into the Kannada language.

CHART-K includes 33 questions which are divided into six major domains including physical independence, cognitive independence, mobility, occupation, social integration, and economic self-sufficiency. A total of 100 neuro-typical individuals (10 males and 10 females in each of the age groups) of age range 25-35 years, 35-45 years, 45-55 years, 55-65 years, and 65-75 years were considered as participants for the study. Ten individuals with aphasia were also included in the study.

This study aimed at investigating the performance of neuro-typical individuals (males and females) and persons with aphasia across various domains of CHART-K.

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 neuro-typical individuals and for individuals with aphasia.

Following conclusions can be drawn from the present study:

- As age increases, physical independence decreases. Older individuals are having lesser physical independence. It is highly variable across gender.
- Males have better cognitive independence than females. As age increases cognitive independence also increases but reduces at the age of >65 years.
- As age increases irrespective of gender independence in mobility reduces.
- Independence in occupation increases from 25 years to 35 years following which it starts decreasing with increased age and males have higher independence in occupation than females.
- Individuals above age 65 years exhibited poor social integration. Across gender, males had higher social integration than females.
- Economic self-sufficiency is highly variable across age. Males have higher independence than females. Among males as age increases independence in economic self-sufficiency reduces.
- The performance of individuals with aphasia was relatively poor than neuro-typical individuals in all the domains of CHART-K

The CHART-K is able to assess the difference in performance among neuro-typical individuals and in persons with aphasia which intern fulfills the purpose of the study.

Implications of the study:

Results of the present study highlight the importance of having a handicap tool to assess the level of handicap in individuals with various types of aphasia. The obtained normative for CHART-K are applicable to Indian context particularly to Karnataka region.

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ALL INDIA INSTITUTE OF SPEECH AND HEARING
MANASAGANGOTRI, MYSORE – 570006

Consent letter for Research paper

Title: Adaptation and validation of Revised Craig Handicap Assessment and Reporting Technique (CHART) in Kannada

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 handicap which can be further incorporated for persons with aphasia. Developing a normative facilitates clinician to assess and to compare the level of handicap in persons with aphasia in terms of mobility, cognition, physical competence, orientation and economic self-efficacy. Also it helps in choosing appropriate therapy goals for individuals with aphasia.

APPENDIX-II

Criag Handicap Assessment and Reporting Technique in Kannada (Scoring sheet)

ಭಾಗ: 1: (ದೈಹಿಕ ಚಟುವಟಿಕೆಗಳು) Physical Independence

1. ನಿಮ್ಮ ದಿನನಿತ್ಯದ ಕೆಲಸಗಳಲ್ಲಿ (ಊಟ ಮಾಡುವುದು, ಸ್ನಾನ ಮಾಡುವುದು, ಬಟ್ಟೆ ಹಾಕಿಕೊಳ್ಳುವುದು, ಶೌಚಾಲಯ ಬಳಸುವುದು ಹಾಗೂ ಓಡಾಡುವುದು) ಯಾರಾದರೂ ನಿಮಗೆ ಸಹಾಯ ಮಾಡುತ್ತಾರಾ?
ಹೌದು/ಇಲ್ಲ

ಹೌದು ಎಂದಲ್ಲಿ, ಒಂದು ದಿನದಲ್ಲಿ ಎಷ್ಟು ಗಂಟೆಗಳಕಾಲ ಸಹಾಯ ಮಾಡುತ್ತಾರೆ? _____

2. ಮೇಲ್ಕಂಡ ಕೆಲಸಗಳನ್ನು ಹೊರತುಪಡಿಸಿ, ಸಾಮಾನ್ಯತರಲು, ಬಟ್ಟೆ ಒಗೆಯಲು, ಮನೆ ಕೆಲಸ ಮಾಡಲು ಮತ್ತು ಔಷಧಿ ತೆಗೆದುಕೊಳ್ಳಲು ಒಂದು ತಿಂಗಳಲ್ಲಿ ಎಷ್ಟು ಗಂಟೆಗಳಕಾಲ ಇತರರ ಸಹಾಯ ಪಡೆಯುತ್ತೀರಿ?
ಒಂದು ತಿಂಗಳಿಗೆ _____ ಗಂಟೆಗಳಕಾಲ ಸಹಾಯ ಪಡೆಯುತ್ತೇನೆ

3. ನಿಮ್ಮ ಸೇವೆ ಮಾಡುವವರಿಗೆ ಸೂಚನೆಗಳನ್ನು ನೀಡುವ ಜವಾಬ್ದಾರಿಯನ್ನು ಯಾರು ತೆಗೆದುಕೊಳ್ಳುತ್ತಾರೆ?

- ನಾನೇ ಸೂಚನೆಗಳನ್ನು ನೀಡುತ್ತೇನೆ
- ಬೇರೆಯವರು/ ಇತರರು
- ಅನ್ವಯಿಸುವುದಿಲ್ಲ, ನಾನು ಯಾರಿಂದಲೂ ಸೇವೆ ಮಾಡಿಸಿಕೊಳ್ಳುವುದಿಲ್ಲ.

A. Total the hours of paid and unpaid care.

B. Divide the hours of occasional care by 30.

C. Add the sums of "A" and "B".

D. If the respondent instructs and directs his/her own attendants or caregivers, multiply the answer of "C" by 3.

If someone other than the respondent instructs and directs the attendants or care givers, multiply the answer of "C" by 4.

E. Subtract the total in "D" from 100.

SCORING

+

(_____/30)
=

X 3 or 4
=

100
Minus

Sum from "D" above

=

--

ಭಾಗ: 2 (ಅರಿವಿನ ಶಕ್ತಿ) Cognitive Independence

4. ನಿಮ್ಮ ಮನೆಯಲ್ಲಿ ನಿಮಗೆ ನೆನಪಿಟ್ಟುಕೊಳ್ಳಲು, ತೀರ್ಮಾನಿಸಲು ಮತ್ತು ನಿರ್ಣಯಿಸಲು ನಿಮಗೆ ಯಾರಾದರೂ ಸಹಾಯ ಮಾಡುತ್ತಾರೆ?

- ನನ್ನ ಜೊತೆ ಯಾವಾಗಲೂ ನನಗೆ ಸಹಾಯ ಮಾಡಲು ಒಬ್ಬರು ಇರುತ್ತಾರೆ.
- ನನ್ನ ಜೊತೆ ಯಾವಾಗಲೂ ಒಬ್ಬರು ಇರುತ್ತಾರೆ ಆದರೆ ಕೆಲವೊಮ್ಮೆ ಮಾತ್ರ ನನಗೆ ಸಹಾಯ ಮಾಡುತ್ತಾರೆ.
- ಕೆಲವೊಮ್ಮೆ ಒಂದು ಅಥವಾ ಎರಡು ಗಂಟೆಗಳಕಾಲ ನನಗೆ ಸಹಾಯ ಮಾಡಲು ಯಾರೂ ಇರುವುದಿಲ್ಲ.
- ಕೆಲವೊಮ್ಮೆ ನಾನು ಒಂಟಿಯಾಗಿ ಕೆಲವು ದಿನಗಳ ಕಾಲ ಇರುತ್ತೇನೆ ನನಗೆ ಸಹಾಯ ಮಾಡಲು ಯಾರೂ ಇರುವುದಿಲ್ಲ.
- ನಾನು ಒಬ್ಬನೆ/ ಒಬ್ಬಳೆ ನೆನಪಿಟ್ಟುಕೊಳ್ಳುತ್ತೇನೆ, ತೀರ್ಮಾನ ಪಡೆಯುತ್ತೇನೆ, ಆಗಾಗ ನನಗೆ ಸಹಾಯ ಪಡೆಯುತ್ತೇನೆ.
- ನಾನು ಒಬ್ಬನೆ/ ಒಬ್ಬಳೆ ನೆನಪಿಟ್ಟುಕೊಳ್ಳುತ್ತೇನೆ, ತೀರ್ಮಾನ ಪಡೆಯುತ್ತೇನೆ ಯಾರ ಸಹಾಯವು ಬೇಡ.

5. ನೀವು ಹೊರಗಡೆ ಹೋದಾಗ ನಿಮಗೆ ನೆನಪಿಟ್ಟುಕೊಳ್ಳಲು, ತೀರ್ಮಾನಿಸಲು ಮತ್ತು ನಿರ್ಣಯಿಸಲು ಸಹಾಯ ಮಾಡಲು ನಿಮ್ಮ ಜೊತೆ ಯಾರಾದರೂ ಬರುತ್ತಾರೆ?

- ನನ್ನ ಜೊತೆ ಯಾರಾದರೂ ಇದ್ದರೂ, ನಾನು ಹೊರಗಡೆ ಹೋಗುವುದಿಲ್ಲ.
- ನನ್ನ ಜೊತೆ ಯಾವಾಗಲೂ ನನಗೆ ಸಹಾಯ ಮಾಡಲು ಒಬ್ಬರು ಇರುತ್ತಾರೆ.
- ನನಗೆ ಗೊತ್ತಿರುವವರ ಬಳಿಗೆ ಮಾತ್ರ ನಾನು ಹೋಗುತ್ತೇನೆ.
- ನನಗೆ ಹೊರಗಡೆ ಹೋಗಲು ಯಾರ ಸಹಾಯವು ಬೇಡ.

SCORING

A. Assign points as follows:

Response #1 = 0 points
Response #2 = 1 points
Response #3 = 2 points
Response #4 = 3 points
Response #5 = 4 points and
Response #6 = 5 points.

x 8

=

B. Multiply points in “A” by 8.

+

C. Assign points as follows:

Response #1 = 0 points
Response #2 = 1 point
Response #3 = 2 points and
Response #4 = 3 points.

x 8

=

D. Multiply points in “C” by 8.

+

6. ಇತರೆ ಜನರನ್ನು ಸಂಪರ್ಕಿಸಲು ನಿಮಗೆ ತೊಂದರೆಯಾಗುತ್ತಿದೆಯೇ?

- ಯಾವಾಗಲೂ ತೊಂದರೆಯಾಗುತ್ತದೆ.
- ಕೆಲವೊಮ್ಮೆ ತೊಂದರೆ ಯಾಗುತ್ತದೆ.
- ತೊಂದರೆಯಾಗುವುದಿಲ್ಲ.

7. ನೀವು ಮುಖ್ಯವಾಗಿ ಮಾಡಬೇಕಾದ ಕೆಲಸಗಳನ್ನು ಮರೆಯುತ್ತೀರಾ?

- ಯಾವಾಗಲೂ ಮರೆಯುತ್ತೇನೆ.
- ಕೆಲವೊಮ್ಮೆ ಮರೆಯುತ್ತೇನೆ.
- ಮರೆಯುವುದಿಲ್ಲ.

8. ನಿಮ್ಮ ಹಣಕಾಸಿನ ವ್ಯವಹಾರವನ್ನು ಯಾರು ನಿಯಂತ್ರಿಸುತ್ತಾರೆ?

- ನನ್ನ ಹಣಕಾಸಿನ ವ್ಯವಹಾರವನ್ನು ಬೇರೊಬ್ಬರು ನಿರ್ವಹಿಸುತ್ತಾರೆ.
- ಸ್ವಲ್ಪ ಹಣವನ್ನು ಮಾತ್ರ ಖರ್ಚುಮಾಡಲು ನನಗೆ ಕೊಡುತ್ತಾರೆ.
- ನನ್ನ ಸಂಪೂರ್ಣ ಹಣದ ತೀರ್ಮಾನಗಳಲ್ಲಿ ಬೇರೆಯವರು ನನಗೆ ಸಹಾಯ ಮಾಡುತ್ತಾರೆ.
- ನನ್ನ ಹಣಕಾಸಿನ ವ್ಯವಹಾರವನ್ನು ನಾನೇ ನಿರ್ವಹಿಸುತ್ತೇನೆ.

E. Assign points as follows:

Response #1 = 0 points

Response #2 = 1 point

Response #3 = 2 points.

F. Multiply points in “E” by 6.

G. Assign points as follows:

Response #1 = 0 points

Response #2 = 1 point

Response #3 = 2 points.

H. Multiply points in “G” by 6.

I. Assign points as follows:

Response #1 = 0 points

Response #2 = 1 point

Response #3 = 2 points and

Response #4 = 3 points.

J. Multiply points in “I” by 4.

K. Add the sums of “B”, “D”, “F”, “H”, and “J”.

x 6

=

+

x 6

=

+

x 4

=

=

ಭಾಗ: 3 (ಚಲನಶೀಲತೆ) Mobility

9. ಒಂದು ದಿನದಲ್ಲಿ ಎಷ್ಟು ಗಂಟೆಗಳಕಾಲ ವಿಶ್ರಾಂತಿ ಪಡೆಯುತ್ತೀರ? _____ ಗಂಟೆಗಳು.
10. ಒಂದು ವಾರದಲ್ಲಿ ನೀವು ಎಷ್ಟು ದಿನಗಳಕಾಲ ಮನೆಯಿಂದ ಹೊರಗಡೆ ಹೋಗುತ್ತೀರ? _____ ದಿನಗಳು.
11. ಕಳೆದ ಒಂದು ವರ್ಷದಲ್ಲಿ ಎಷ್ಟು ದಿನಗಳು ಮನೆಯಿಂದ ಹೊರಗಡೆ ಕಳೆದಿದ್ದೀರ? (ಆಸ್ಪತ್ರೆಯನ್ನು ಹೊರತುಪಡಿಸಿ)
- ಒಂದು ದಿನವು ಇಲ್ಲ
 - ೧-೨ ದಿನಗಳು
 - ೩-೪ ದಿನಗಳು
 - ೫ ಅಥವಾ ಹೆಚ್ಚು
12. ಯಾರ ಸಹಾಯವು ಇಲ್ಲದೆ ನೀವು ಮನೆಯಿಂದ ಹೊರಗೆ ಅಥವಾ ಒಳಗೆ ಓಡಾಡುತ್ತೀರ? **ಹೌದು/ಇಲ್ಲ**
13. ಮನೆಯಲ್ಲಿ ಯಾರ ಸಹಾಯವು ಇಲ್ಲದೆ, ನೀವು ಮಲಗುವ ಜಾಗಕ್ಕೆ ಹೋಗುವುದು, ಅಡಿಗಮನೆಗೆ ಹೋಗುವುದು, ಸ್ನಾನದಮನೆಗೆ ಹೋಗುವುದು, ದೂರವಾಣಿ, ಟೀವಿ ಅಥವಾ ರೇಡಿಯೋ ಉಪಯೋಗಿಸುತ್ತೀರ? **ಹೌದು/ಇಲ್ಲ**
14. ನೀವು ಹೊರಗಡೆ ಹೋಗಬೇಕಾದರೆ ಯಾರ ಸಹಾಯವನ್ನುಪಡೆಯದೆ ನಿಮ್ಮ ವಾಹನದ ವ್ಯವಸ್ಥೆಯನ್ನು ಮಾಡಿಕೊಳ್ಳುತ್ತೀರ? **ಹೌದು/ಇಲ್ಲ**

A. Multiply the number of hours out of bed by 2.

B. Multiply the number of days per week out of the house by 5.

C. Assign points as follows:

No nights out = 0

1-2 nights out = 10

3-4 nights out = 15

5 or more nights = 20.

D. For questions #12-#17, assign 5 points for each "yes" response and 0 points for each "no" response.

E. Add the sums from "A", "B", "C", and "D". If the total sum is greater than 100, enter 100.

SCORES

+

+

+

(# 12)

+

(# 13)

+

(# 14)

+

15. ನಿಮ್ಮ ವಾಹನದ ವ್ಯವಸ್ಥೆಯು, ನೀವು ಯಾವ ಯಾವ ಸ್ಥಳಗಳಿಗೆ ಹೋಗಬೇಕೆಂದು ಬಯಸುವಿರಿ ಅಲ್ಲಿಗೆ ಹೋಗಲು ಸಹಾಯ ಮಾಡುತ್ತದೆಯೇ? ಹೌದು/ಇಲ್ಲ

(# 15)

+

16. ನಿಮ್ಮ ವಾಹನದ ವ್ಯವಸ್ಥೆಯು, ನಿಮಗೆ ಬೇಕಾದಾಗ ಇಳಿಯಲು ಅವಕಾಶ ನೀಡುತ್ತದೆಯೇ? ಹೌದು/ಇಲ್ಲ

(# 16)

+

17. ನಿಮ್ಮ ವಾಹನವನ್ನು ಸ್ವಲ್ಪ ಅಥವಾ ಚೂರು ಯೋಚನೆಮಾಡದೆ/ಹಿಂಜರಿಯದೆ ಉಪಯೋಗಿಸುವಿರಾ? ಹೌದು/ಇಲ್ಲ

(# 17)

=

ಭಾಗ: 4 (ಉದ್ಯೋಗ) Occupation

18. ಒಂದು ವಾರದಲ್ಲಿ ಎಷ್ಟು ಗಂಟೆಗಳಕಾಲ ಕೆಲಸಕ್ಕೆ (ಸಂಬಳಬರುವ) ಹೋಗುತ್ತೀರ?
_____ ಗಂಟೆಗಳು

19. ಒಂದು ವಾರದಲ್ಲಿ ಎಷ್ಟು ಗಂಟೆಗಳ ಕಾಲ ಪದವಿ ಪೂರ್ವ ಶಾಲೆಯಲ್ಲಿ ಅಥವಾ ತರಬೇತಿ ಕಾರ್ಯಕ್ರಮದಲ್ಲಿ ಭಾಗವಹಿಸುತ್ತೀರ (ತರಗತಿ ಹಾಗೂ ವಿದ್ಯಾಭ್ಯಾಸದ ಅವಧಿ ಒಳಗೊಂಡಂತೆ)
_____ ಗಂಟೆಗಳು

20. ಒಂದು ವಾರದಲ್ಲಿ ಎಷ್ಟು ಗಂಟೆಗಳ ಕಾಲ ನೀವು ಮನೆಕೆಲಸ, ಮಕ್ಕಳನ್ನು ನೋಡಿಕೊಳ್ಳುವುದು ಹಾಗೂ ಅಡಿಗೆ ತಯಾರಿಯಲ್ಲಿ ತೊಡಗಿದ್ದೀರ?
_____ ಗಂಟೆಗಳು

21. ಒಂದು ವಾರದಲ್ಲಿ ಎಷ್ಟು ಗಂಟೆಗಳ ಕಾಲ ನೀವು ತೋಟ ನಿರ್ವಹಣೆ, ಮನೆ ದುರಸ್ತಿ ಹಾಗೂ ಮನೆ ಅಭಿವೃದ್ಧಿ ಮುಂತಾದ ಮನೆ ಕೆಲಸ ನಿರ್ವಹಣೆಯಲ್ಲಿ ತೊಡಗಿರುತ್ತೀರಿ?
_____ ಗಂಟೆಗಳು

22. ಒಂದು ವಾರದಲ್ಲಿ ಎಷ್ಟು ಗಂಟೆಗಳ ಕಾಲ ನೀವು ಯಾವುದಾದರೂ ಸಂಸ್ಥೆಗೆ ಸ್ವಯಂಸೇವಕರಾಗಿ ಕಾರ್ಯನಿರ್ವಹಿಸುತ್ತೀರಿ?
_____ ಗಂಟೆಗಳು

23. ಒಂದು ವಾರದಲ್ಲಿ ಎಷ್ಟು ಗಂಟೆಗಳ ಕಾಲ ಕ್ರೀಡೆ, ವ್ಯಾಯಾಮ, ಚಲನಚಿತ್ರ ವೀಕ್ಷಣೆ ಮುಂತಾದ ಮನೋರಂಜನೆ ಕಾರ್ಯಕ್ರಮಗಳಲ್ಲಿ ಭಾಗವಹಿಸುವಿರಿ? (ದೂರದರ್ಶನ ವೀಕ್ಷಿಸಿದ ಹಾಗೂ ರೇಡಿಯೋ ಕೇಳಿದ ಅವಧಿವನ್ನು ಸೇರಿಸಬೇಡಿ)
_____ ಗಂಟೆಗಳು

A. Multiply the number of hours working by 2.

B. Multiply the number of hours in school by 2.

C. Multiply the number of hours in active homemaking by 2.

D. Multiply the number of hours in home maintenance by 2.

E. Add the number of hours in volunteer work to the number of hours in recreational activities and the number of hours in other self-improvement activities.

SCORES

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(# 23)

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24. ಒಂದು ವಾರದಲ್ಲಿ ಎಷ್ಟು ಗಂಟೆಗಳ ಕಾಲ ಹವ್ಯಾಸಗಳು ಅಥವಾ ಅಧ್ಯಯನದಂತಹ ಸ್ವಂತ ಅಭಿವೃದ್ಧಿ ಕಾರ್ಯಗಳಲ್ಲಿ ತೊಡಗುವಿರಿ? (ದೂರದರ್ಶನ ವೀಕ್ಷಿಸಿದ ಹಾಗೂ ರೇಡಿಯೋ ಕೇಳಿದ ಅವಧಿವನ್ನು ಸೇರಿಸಬೇಡಿ)

_____ ಗಂಟೆಗಳು

F. Add the sums of "A", "B", "C", "D", and "E". If the total sum is greater than 100, enter 100.

(# 24)

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ಭಾಗ: 5 (ಸಾಮಾಜಿಕ ಒಗ್ಗಟ್ಟು) Social Integration

25. ನೀವು ಒಬ್ಬರೆ ವಾಸವಿದ್ದೀರ? ಹೌದು/ಇಲ್ಲ

ಅ. (ಒಬ್ಬರೆ ವಾಸವಿದ್ದಲ್ಲಿ) ನಿಮ್ಮ ಸಂಗಾತಿ ಅಥವಾ ನಿಮಗೆ ಬೇಕಾದ ಬೇರೊಬ್ಬರ ಜೊತೆ ವಾಸಮಾಡುತ್ತಿದ್ದೀರ? ಹೌದು/ಇಲ್ಲ

26. ನಿಮ್ಮ ಸಂಗಾತಿಯೊಡನೆ ಸಂತೋಷವಾಗಿದ್ದೀರ?

___ ಹೌದು ___ ಇಲ್ಲ ___ ಈ ಪ್ರಶ್ನೆ ನನಗೆ ಅನ್ವಯಿಸುವುದಿಲ್ಲ

27. ಒಂದು ತಿಂಗಳಲ್ಲಿ ಎಷ್ಟು ಸಂಬಂಧಿಕರನ್ನು ಭೇಟಿಯಾಗುತ್ತೀರಿ, ಕರೆಮಾಡುತ್ತೀರಿ ಅಥವಾ ಪತ್ರಬರೆಯುತ್ತೀರಿ?

___ ಸಂಬಂಧಿಕರು

28. ಕನಿಷ್ಠ ಒಂದುಬಾರಿಯಾದರು ಒಂದು ತಿಂಗಳಲ್ಲಿ ಎಷ್ಟು ವ್ಯಾಪಾರಿಗಳು ಅಥವಾ ಸಂಸ್ಥೆಯ ಸಹವರ್ತಿಗಳನ್ನು ಭೇಟಿಯಾಗುವಿರಿ, ಕರೆಮಾಡುವಿರಿ ಅಥವಾ ಪತ್ರಬರೆಯುವಿರಿ?

___ ವ್ಯಾಪಾರಿಗಳು ಅಥವಾ ಸಂಸ್ಥೆಯ ಸಹವರ್ತಿಗಳನ್ನು

29. ಕನಿಷ್ಠ ಒಂದುಬಾರಿಯಾದರು ಒಂದು ತಿಂಗಳಲ್ಲಿ ಎಷ್ಟು ಸ್ನೇಹಿತರನ್ನು ಭೇಟಿಯಾಗುವಿರಿ, ಕರೆಮಾಡುವಿರಿ ಅಥವಾ ಪತ್ರಬರೆಯುವಿರಿ?

___ ಸ್ನೇಹಿತರು

30. ಕಳೆದ ತಿಂಗಳಲ್ಲಿ ಎಷ್ಟು ಜನ ಅಪರಿಚಿತರೊಡನೆ ಮಾತನಾಡಿದ್ದೀರಿ? (ಉದಾಹರಣೆ: ಏನಾದರೂ ಮಾಹಿತಿಪಡೆಯಲು ಇತ್ಯಾದಿ)

- ಒಬ್ಬರೊಂದಿಗೂ ಮಾತನಾಡಿಲ್ಲ
- ೧-೨ ಅಪರಿಚಿತರು
- ೩-೫ ಅಪರಿಚಿತರು
- ೬ ಅಥವಾ ಹೆಚ್ಚು ಅಪರಿಚಿತರು

A. Assign 30 points if living with Spouse/partner/parents OR assign 20 points if living alone

B. Assign 20 points if person is happy with his/her spouse, unless points are assigned in "A".

If person is happy with his/her spouse and points are assigned in "A", then "B" equals 30 minus "A".

C. Number of relatives contacted monthly should be multiplied by 5. A maximum score for this component is 25 points.

D. Number of business or organizational associates contacted monthly should be multiplied by 2. A maximum score for this component is 20 points.

E. Number of friends contacted monthly should be multiplied by 10. A Maximum score for this component is 50 points.

F. Assign points as follows:

None = 0 points

1-2 = 10 points

3-5 = 15 points

6 or more = 20 points.

G. Add the sums from "A", "B", "C", "D", "E", and "F". If the total sum is greater than 100, enter 100.

SCORES

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ಭಾಗ: 6 (ಆರ್ಥಿಕ ಸ್ವಾವಲಂಬನೆ) Economic Self Sufficiency

31. ನಿಮ್ಮ ಕುಟುಂಬದ ಎಲ್ಲಾ ಸದಸ್ಯರ ಆದಾಯವನ್ನು ಸೇರಿ, ಕಳೆದ ವರ್ಷದಲ್ಲಿ ನಿಮ್ಮ ಒಟ್ಟು ವಾರ್ಷಿಕ ಆದಾಯ ಎಷ್ಟಿರಬಹುದು? (ಎಲ್ಲಾ ಮೂಲಗಳನ್ನು ಪರಿಗಣಿಸಿ: ವೇತನ, ಸಂಪಾದನೆ, ಅಂಗವಿಕಲತೆಯ ಲಾಭ, ಪಿಂಚಣಿ, ನಿವೃತ್ತಿ ಆದಾಯ, ನ್ಯಾಯಾಲಯದ ಒಪ್ಪಂದದಿಂದ ಬಂದ ಆದಾಯ, ಬಂಡವಾಳ ಹಾಗೂ ಟ್ರಸ್ಟ್ ನಿಧಿಗಳು, ಮಕ್ಕಳ ಬೆಂಬಲ ಹಾಗೂ ಜೀವನಾಂಶಗಳು, ಸಂಬಂಧಿಕರ ಕೊಡುಗೆ, ಇತ್ಯಾದಿ)

_____ ರೂಪಾಯಿಗಳು.

- ಅ. ನಿಮ್ಮ ಮನೆಯಲ್ಲಿ ಎಷ್ಟು ಜನ ಇದ್ದೀರಿ? _____ ಜನ
ಆ. ನಿಮ್ಮ ವಾರ್ಷಿಕ ಆದಾಯ ಎಷ್ಟು? _____ ರೂಪಾಯಿಗಳು.
ಇ. ಆದಾಯ ತೆರಿಗೆ ಪಾವತಿಸುತ್ತಿದ್ದೀರ? ಹೌದು/ಇಲ್ಲ

32. ಕಳೆದ ವರ್ಷದಲ್ಲಿ ವೈದ್ಯಕೀಯ ರಕ್ಷಣೆಯ ವೆಚ್ಚ ಎಷ್ಟಿರಬಹುದು? (ನೀವು ವ್ಯಚ್ಛಮಾಡಿರುವ ಹಣ ಅಥವಾ ಮನೆಯ ಸದಸ್ಯರಾದವು ವ್ಯಚ್ಛಮಾಡಿರುವ ಹಣವನ್ನು ಪರಿಗಣಿಸಬಹುದು. ಆದರೆ ವಿಮೆ ಇಂದ ಮರುಪಾವತಿಯಾಗಿರುವ ಹಣವನ್ನು ಪರಿಗಣಿಸಬಾರದು)

_____ ರೂಪಾಯಿಗಳು.

33. ನೀವು ಆರೋಗ್ಯಕ್ಕೆ ಸಂಬಂಧಪಟ್ಟ ಯಾವುದಾದರೂ ವಿಮೆಯನ್ನು ಪಾವತಿಸುತ್ತಿದ್ದೀರ?

- ___ ಇಲ್ಲ
___ ಹೌದು ಪ್ರತಿ ತಿಂಗಳು _____ರೂಪಾಯಿಯನ್ನು ಪಾವತಿಸುತ್ತಿದ್ದೀರಿ.

A.Subtract the unreimbursed medical expenses from the annual income (amount in question #31 minus amount in question #32).

Assign points based on per capita income

- Above Rs. 75000: 100 points
Rs. 50000-75000: 75 points
Rs. 30000-50000: 50 points
Rs. 15000-30000: 25 points
Below Rs. 15000: 0 points

SCORES

APPENDIX- C

Normative scores for CHART across each domain with respect to age and gender.

1. Physical independence

Age groups	Gender	N	Mean	Standard deviation (SD)	Median	95% Confidence Interval for mean	
						Minimum	Maximum
>25 to ≤35	Male	10	99.21	1.377	100.00	98.22	100
	Female	10	99.27	1.087	99.95	98.49	100
>35 to ≤45	Male	10	98.83	1.207	98.80	97.96	99.69
	Female	10	98.71	1.686	99.60	97.50	99.91
>45 to ≤55	Male	10	98.20	1.344	97.95	97.23	99.16
	Female	10	98.80	1.583	99.80	97.66	99.93
>55 to ≤65	Male	10	99.22	1.157	100.00	98.39	100
	Female	10	99.07	1.220	99.50	98.19	99.94
>65 to ≤75	Male	10	98.28	1.369	98.30	97.30	99.26
	Female	10	98.74	1.275	99.20	97.82	99.65

2. Cognitive independence

Age groups	Gender	N	Mean	Standard deviation (SD)	Median	95% Confidence Interval for mean	
						Minimum	Maximum
>25 to ≤35	Male	10	86.10	12.458	89.00	77.18	95.01
	Female	10	63.60	19.817	59.00	49.42	77.77
>35 to ≤45	Male	10	94.00	8.844	100.00	87.67	100
	Female	10	84.50	10.927	84.00	76.68	92.31
>45 to ≤55	Male	10	99.20	2.530	100.00	97.39	101.01
	Female	10	70.80	19.714	68.00	56.69	84.90
>55 to ≤65	Male	10	100.00	0.000	100.00	100	100
	Female	10	83.50	12.955	84.00	74.23	92.76
>65 to ≤75	Male	10	84.00	19.573	96.00	69.99	98
	Female	10	67.00	22.534	53.00	50.88	83.12

3. Mobility

Age groups	Gender	N	Mean	Standard deviation (SD)	Median	95% Confidence Interval for mean	
						Minimum	Maximum
>25 to ≤35	Male	10	96.70	6.237	100.00	92.23	101.16
	Female	10	92.70	9.889	98.50	85.62	99.77
>35 to ≤45	Male	10	98.20	4.733	100.00	94.81	101.58
	Female	10	89.10	8.850	89.50	82.76	95.43
>45 to ≤55	Male	10	97.70	7.273	100.00	92.49	102.90
	Female	10	90.70	9.346	93.00	84.01	97.38
>55 to ≤65	Male	10	96.10	6.488	100.00	91.45	100.74
	Female	10	88.10	10.898	91.00	80.30	95.89
>65 to ≤75	Male	10	87.60	16.091	96.50	76.08	99.11
	Female	10	64.40	15.551	60.00	53.27	75.52

4. Occupation

Age groups	Gender	N	Mean	Standard deviation (SD)	Median	95% Confidence Interval for mean	
						Minimum	Maximum
>25 to ≤35	Male	10	91.90	13.812	100.00	82.02	101.78
	Female	10	72.60	29.065	75.00	51.80	93.39
>35 to ≤45	Male	10	93.80	8.929	100.00	87.41	100.18
	Female	10	83.60	21.334	100.00	68.33	98.86
>45 to ≤55	Male	10	86.30	14.712	90.00	75.77	96.82
	Female	10	81.95	25.151	95.50	63.95	99.94
>55 to ≤65	Male	10	80.40	20.818	84.00	65.50	95.29
	Female	10	73.95	27.769	85.00	54.08	93.81
>65 to ≤75	Male	10	49.05	32.554	45.75	25.76	72.33
	Female	10	64.50	32.565	61.00	41.20	87.79

5. Social integration

Age groups	Gender	N	Mean	Standard deviation (SD)	Median	95% Confidence Interval for mean	
						Minimum	Maximum
>25 to ≤35	Male	10	98.80	3.795	100.00	96.08	101.51
	Female	10	83.40	14.025	82.50	73.36	93.43
>35 to ≤45	Male	10	90.60	12.176	97.50	81.88	99.31
	Female	10	89.00	14.368	96.50	78.72	99.27
>45 to ≤55	Male	10	93.60	6.569	95.00	88.90	98.29
	Female	10	91.40	10.102	95.50	84.17	98.62
>55 to ≤65	Male	10	92.80	13.079	100.00	83.44	102.15
	Female	10	92.60	8.113	92.50	86.79	98.40
>65 to ≤75	Male	10	87.10	17.432	97.00	74.63	99.57
	Female	10	67.00	19.944	62.00	52.73	81.26

6. Economic self-sufficiency

Age groups	Gender	N	Mean	Standard deviation (SD)	Median	95% Confidence Interval for mean	
						Minimum	Maximum
>25 to ≤35	Male	10	100.00	0.000	100.00	100	100
	Female	10	17.50	37.361	0.00	9	44.2
>35 to ≤45	Male	10	100.00	0.000	100.00	100	100
	Female	10	60.00	39.441	50.00	31.78	88.21
>45 to ≤55	Male	10	90.00	31.623	100.00	67.37	112.62
	Female	10	20.00	42.164	0.00	10.16	50.16
>55 to ≤65	Male	10	85.00	21.082	100.0	69.91	100.08
	Female	10	75.00	31.180	87.50	52.69	97.30
>65 to ≤75	Male	10	72.50	34.258	87.50	47.99	97
	Female	10	40.00	44.410	25.00	8.23	71.76

CHART total scores.

Age groups	Gender	Mean	Standard deviation (SD)	95% Confidence Interval for mean	
				Minimum	Maximum
>25 to ≤35	Male	572.71	27.168	553.27	592.14
	Female	428.07	78.346	320.26	483.01
>35 to ≤45	Male	575.43	24.078	558.20	592.65
	Female	504.91	49.105	469.78	540.03
>45 to ≤55	Male	565.00	43.227	534.07	595.92
	Female	453.65	80.368	396.15	511.14
>55 to ≤65	Male	547.52	47.884	515.88	581.15
	Female	505.22	64.255	459.25	551.18
>65 to ≤75	Male	478.53	82.008	419.86	537.19
	Female	401.64	113.760	320.26	483.01