**PG RESEARCH PROPOSAL**

**Topic- Development of an android application in Kannada to enhance picture naming skills in persons with aphasia**

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**Introduction**

Stroke is one of the leading causes of death and disability in India. The estimated prevalence rate of stroke range, 84-262/100,000 in rural and 334-424/100,000 in urban areas. Stroke is a common cause of aphasia (Tonkonogy, 1986). During 1982-84, a study was carried out in Karnataka which estimated 1.18/1000 and 0.98/1000 prevalence in the urban and rural areas respectively. The prevalence increased to 1.154 per thousand in Karnataka during 1993-95 (Banerjee & Das, 2006). Among 60 diseases and 15 health conditions, aphasia shows the largest negative relationship with the health-related quality of life measure (HRQoL) in long-term care settings (Lam & Wodchis, 2010).

Epidemiology of aphasia is not only the major problem but treatment efficacy carries equal importance. There are various approaches to aphasia therapy stemming from various theorical accounts. However still there are various questions which need to be tackled such as timing, Intensity and Specificity of the treatment. Treatment efficacy till now is based on various study design where Systematic reviews are 3% , RCTs are 7% ,Non-RCTs are 5% ,Case series are 15% ,Single-Subject designs are 70% ( Togher et al., 2009). In the literature various Single study designs are reported which indicate the lack of uniformity in the techniques which can be used for same type of aphasia. While comparing all treatment techniques Melody Intonation therapy has given promising effect in improving communication skills mainly in Broca’s Aphasia. Wide therapy approaches has failed by its evidence. Evidence base for efficacy and effectiveness of aphasia treatment is, however, growing (Brady et al., 2012).

In the recent past, the rise of model-driven treatment approaches have shown some promising effects of treatment in persons with aphasia. One such technique to enhance naming is Semantic feature analysis and its similar technique i.e phonological treatment analysis where it targets semantic and phonological processes have found researcher to think about this.

These theoretically driven techniques needs to be tested empirically. A survey of speech language pathologists in India to know current status of aphasic treatment in the country reports that considerable proportion of people with aphasia do not receive adequate rehabilitative services (Krishnan and Tiwari 2011). The authors attributed this to several reasons such as the distant location of the clinical service centres, and the availability of trained professionals. The technology may be invited to fill in these potential lacunae.

**Review of literature:**

Smart phone technology can be used to facilitate the gap between intensive therapy and current status. India has become the second-biggest smart phone market in terms of active unique smart phone users. Recent estimation is that roughly 35 million smart phone users come from rural India and this number is growing rapidly, and could cross the 50 million mark in the first half of 2015, with 2016 being an inflection point for smart phone growth in rural India.

Naming deficits are common to all aphasia types. SFA and PCA tasks were chosen to target primarily semantic and phonological processing where it assumes enhancement of naming. SFA incorporates the principle of choice, a factor that has been identified by some as being important in producing longer-lasting effects of treatment (e.g., Hickin, Best, Herbert, Howard, & Osborne, 2002). SFA therapy approach was effective in improving auditory comprehension of single words in a person with Global

aphasia. (Munro & Samantha Siyambalapitiya ,2016)

PCA technique also has influence in comprehension, where studies have used this technique in both fluent and non fluent aphasia. By targeting semantic and phonologically processing deficits we can find improvement in not only naming aspects but also comprehension too. There are various applications created with base of phonological and semantic treatment such as tactus therapy and talk back.

**Need for the Study:**

Considerable proportion does not receive therapy in India mainly due to Dearth of trained professionals and distant rehabilitation centers. Theory driven techniques and incorporation to technology is in high demand to overcome the problem.

Smart phone and its applications are not new to the market. In the international scenario, several mobile-based applications have been developed to facilitate the provision of treatment in persons with aphasia. However this potential has not been sufficiently exploited in the Indian context. Further, as mentioned above, barriers in service delivery due to various reasons may be overcome by such applications.

**AIM OF THE STUDY:**

To develop an android application to enhance picture naming skills in persons in aphasia.

**Objectives:**

1. Preparation of a set of stimuli for treating naming deficits in persons with aphasia.
2. Integration of the training stimuli into the Android environment
3. Pilot testing of the application

**METHODOLOGY:**

Study will be done in three phases

**Phase 1-** *Preparation and validation of items*

A list of 150 Kannada words will be pooled from the resources like dictionary. These words will include items from different categories such as animals, Birds, insects, vegetables, fruits, vehicles, body parts, daily use items. The technique which will be used in the study will be Phonological Component Analysis. PCA will be modified considering Kannada language and set of cues will be carefully selected.

The stimuli subjected will be given to 3 Kannada teaching teachers , 2 Speech language pathologists, 5 Kannada speaking individuals for familiarity, relatedness and imageability check. This will be done by using 3point rating scale.

Familiarity- : 0 = highly unfamiliar, 1 = somewhat familiar, 2 = highly familiar

Relatedness- 0 = highly unrelated, 1 = somewhat related, 2 = highly related

Imagibility- 0 = less imageable, 1 = somewhat imageable, 2 = highly imageable

Final set of minimum 100 will be selected considering highly familiar, highly related and highly imageable phonologically by taking 8 out of 10 people will be used as training material.

Development of the training set:

**Phase 2**- *Development of the Android application*

The Phase 2 will be implemented with the help of the technical team. The application will be designed to do the following:

1. Present all the 100 pictures one-by-one (requires the vocal response capture and storing). Further, an accuracy indicator (correct/incorrect button) needs to be used.
2. From all the failed items 50 items (or all items if the total number of failed items is ≤50) will be selected for the training purpose.
3. An algorithm would be implemented to distribute 5 training items per day.
4. The user log will be saved and transferred to the investigator (web-based)

**Phase 3-**

The Android application would be pilot-tested in a group of 10 participants with naming difficulty following aphasia.

**Participants**-

**Inclusion criteria:**

1. Native Kannada speakers
2. Aged between 18-75 years
3. Diagnosis of stroke
4. Onset of stroke at least three months prior to study
5. Diagnosis of aphasia, as confirmed by a trained speech and language therapist (based on Western Aphasia Battery [Kannada version])
6. Handedness - Right

**Exclusion criteria**:

1. Persons with poor visual acuity
2. Attending speech-language therapy

**Procedure** – Prior to providing Application WAB-K, BNT-K and SAQOL-K will be administered

Informed consent will be taken and internet chargers will be provided by the Investigator

The home training module will be timed for daily session, number of items completed and usage of ration. The investigator electronically tracks (through email updates from the Android program) the progress of the therapy sessions. Home training is subjected to 10days in the study. After completion of training WAB-K, BNT-K and SAQOL-K will be administered.

**STATISTICAL ANALYSIS:** Will be done after pilot study and suitable analysis will be discussed after statistical appointment

**STUDY DURATION:** January 2017 – January 2018

**TIME FRAME:**

**Phase 1-** Preparation and validation of items – 1st January 2017 to 1st March 2017

**Phase 2**- Development of the Android application – 2nd March 2017 to 31st May 2017

**Phase 3**- Pilot Test of the application on 10 Individuals -1st June to 31st December

**Thesis Writing-** January 2018

**References**

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