



TECHNOLOGICAL REHABILITATION OF ADULT STUTTERERS: AWARENESS AND NEED ANALYSIS.

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Abstract:

Background: There is a high prevalence of stuttering and a dire need of evidence based assessment and management strategies with diverse range of interventions for stuttering with therapeutic intentions in vague.

Aim: To explore awareness of novel technological rehabilitation and current trends in practices of Speech Language Pathologists (SLP) and Psychologists for management of adult stuttering.

Material & Methods: This exploratory qualitative research design with purposive sampling was conducted at Riphah International University from March to August 2021. Study recruited N=12 practicing SLP's and Psychologists, well versed in English, with MS and/or PhD & minimum of 5 years' experience. An interview guide was prepared and piloted and final interview guide used for in depth interviews to collect data and thematic analysis was conducted and themes drawn manually.

Results: Study revealed 13 themes including Adult Stutterers Emotional state, Factors effecting stutterers' speech, causes of stuttering, Secondary symptoms of stuttering, Assessment approach, Therapeutic approach, Contemporary trends of assessment, Contemporary trends of management and Factors effecting prognosis/Outcomes of therapy, Awareness of self-help therapy, Knowledge of digital applications and Need/ suggestions for application development & Content of the applications. Participants were not aware of digital applications and technological rehabilitation, however need of such optimal digital applications was noted and participants suggested that application should be in Urdu Language, with informal assessment and record keeping.

Keywords: Assessment approaches, Combined approach, Digital applications, Developing countries, Quality of life, Self-help therapy, Speech Language Pathologists, Stuttering.

Introduction

Stuttering is a complex fluency disorder of neural coordination which is characterized by repetitions, sound prolongations and blocks during speech production (1). Developmental stuttering usually starts at 2 to 4 years and around 75% outgrow it within a period of 18 months (2). In adults, stuttering is considered as a group of experiences in addition to speech dysfluency including anticipation of a thought of being stuck or loss of control while speaking that can result in a number of affective, cognitive and behavioral issues posing detrimental impact on the lives of stutterers (3).

Stuttering affects around 1% of the world population while the incidence ranges between 5-8% (2). Developmental stuttering like dysfluencies is seen in 3% monolinguals and 3% to 22% in bilinguals (4) with male gender being more commonly affected (2). In most cases of developmental stuttering recovery is spontaneous without intervention before 8 years of age, however late presentation is associated with reduced rate of recovery and severity rating is high at age above 12 years (5).

Speech language pathologists (SLPs) and psychologists use a number of assessment methods to evaluate stuttering with Percentage Syllable Stutter (SS%) Speech Efficiency Score (SES) and Speech Control Index (SCI) commonly employed by SLPs (1). On the other hand, psychologists focus more on the psychological aspects like covert and overt behaviors, depression, anxiety, stress and experiences. Attitudinal changes due to stuttering with overall assessment of the Speaker's Experience of Stuttering (OASES) are frequently used to assess stutterer's overall negative experiences and avoidance strategies (6).

A diverse range of traditional interventions for stuttering with therapeutic intentions are in practice including face to face sessions, group sessions, tele-practice sessions, practice through audio taped speech pattern practice and self-help therapy (7) with one-to-one session, group therapy, tele-practice and digital applications being the main choices of treatment in a global perspective. The intervention by SLPs to target adult stuttering mainly focusses on new techniques of speech modification to improve speech fluency. The management of stuttering and speech restructuring is used in unison to help overcome stuttering (8). As pandemic has given birth to the new era of technology, tele-practice and digital applications have turned into the favored choice of adult stutters with tele-practice being effective for those who were technology well-oriented (9). The findings of a systematic review indicate that technology has highlighted exhilarating advancements. When healthcare professionals use such advanced technologies, it improves the therapeutic outcomes and brings ease to populations hailing from far flung areas as well. As far as the stuttering is concerned a wide range of technological interventions have been adopted globally. There are many applications available that assist stutters to use technology-oriented intervention programs. These technological rehabilitation programs include tele-practice, software, virtual reality, video group therapy links, applications for delayed auditory feedback and neuro-modulation. Besides intervention modern day technology has opened the doors of assessment too. According to the findings of systematic review, the broadly applied technology centered assessment applications are syllable stuttered (%SS) (10). ASHA's survey revealed that widely used digital applications by stutters are those that create synchronous video communication and includes speech exercises, training and real time video conferencing (11). A local study by Noreen H et al. to assess the awareness of stutterers about their problems and the self-help techniques employed reported that PWS have awareness about self-help techniques though they lacked knowledge regarding mobile software and computer-based software in such a perspective (12). There remains dearth of local data concerning technological rehabilitation.

The current inclination in the management of stuttering is a combined approach designed to restructure speech and also to manage speech anxiety. Tangible evidence has emerged about the combined approach that can adequately manage stuttering by addressing the self-focused attention, use of safety behaviors and applying speech reconstruction together (13). The primary aim of interventional therapy is to avoid relapse upon discontinuation of therapy therefore a multimodal approach integrating counselling jointly with therapy may be appropriate to overcome such recurring challenges encountered by therapists (14).

Research and clinical trials on the theme and topic at hand have been advocated since it could result in regularly initiating optimum speech as well as psychological interventions for stutterers (13, 14). The present study was envisaged in the backdrop of high prevalence and the dire need of assessment and management of this population with the objective to investigate awareness of innovative technological rehabilitation and contemporary propensities and practices of SLPs and psychologists for management of adult stuttering arising out of their own clinical experience with stuttering. This study is significant as it adds value to the literature about latest trends of assessment and management practices utilized by SLPs and psychologists while focusing on large research gaps incorporating usage of mobile technological applications to tackle the stuttering population in developing countries by providing ease, reducing financial constraints and enhanced quality of life.

Materials & Methods

This exploratory qualitative research design utilizing purposive sampling technique was conducted at Riphah College of Rehabilitation and Allied Health Sciences, Riphah International University, Lahore over a period of 6 months from 1st March 2021 to 31st August, 2021. The study was conducted following approval of Research and Ethics Committee Riphah International University vide Registration # REC/RCR & AHS/21/1111 dated 12 February, 2021 and informed consent of the participants.

Participants

A sample of N= 2 participants including a SLP and a psychologist was recruited for pilot study while a sample of N= 12 participants including six SLPs and six psychologists were recruited for the main study. The sample comprised practicing SLPs and psychologists with MS and/or PhD qualification and a minimum of 5 years of experience in the relevant specialty and well versed in English language (table 1). The main study was conducted with data collected from sample of 12 participants. Online interviews were conducted using Zoom application due to Covid-19 pandemic.

Instrument

The study was conducted with in depth interviews in English with questions for interview guide developed, piloted and final guide used in the same study and thematic analysis conducted. The interview guide was designed keeping in view the research objectives and reviewed by two field experts and their opinion incorporated regarding different questions resulting in exclusion, inclusion or modification of certain questions. This was followed by pilot testing of the interview guide on two participants, including a SLP and psychologist to determine the designed items in the interview guide thorough discussion. After analyzing the results of pilot interview, suitability and appropriateness of interview questions was re-assessed and finally a semi structured interview guide was developed consisting of 8 questions with appropriate probes, covering stutterers' experiences, emotional health, assessment and management techniques, contemporary trends of assessment and management, effects of therapy and opinion about self-help therapeutic approach. The interview guide was prepared in English language as participants who took part in the research were proficient in English hence the medium for communication was same.

Procedure:

Purposive sampling technique was employed and participants were contacted for consent to partaking in the study. Formal appointment from each participant as per their availability was sought and the interviews were conducted with average time duration of 40 to 55 minutes indicating ample time to obtain sufficient data from the participants while consent was obtained prior for recording the interviews. Following the interviews, the data was transcribed verbatim and then subjected to thematic analysis. After generating initial codes, searching for themes, exhausting, reviewing and developing categories, subcategories, the themes were developed (figure 1). Finally, after fine-tuning, the results were organized towards a rational and consistent arrangement and presented in tabulated form.

Results

The current thematic analysis revealed 13 themes including “adult stutterers emotional state”, “factors effecting stutterers’ speech”, “causes of stuttering”, “secondary symptoms of stuttering”, assessment approach, therapeutic approach, contemporary trends of assessment, contemporary trends of management and factors effecting prognosis/outcomes of therapy, awareness of self-help therapy, knowledge of digital applications and need / suggestions for application development & content of the applications. Enumerated in table 2 are themes and linkages of these themes/ categories to subthemes/ subcategories.

Discussion:

The thematic analysis explored awareness of innovative technological rehabilitation and contemporary trends employed by speech language pathologists (SLP) and clinical psychologists (CP) for management of adult stuttering revealing thirteen themes.

The outcome of current study has highlighted that “self-help therapy” has been used by adult stutters widely but none have reported to use any of the technological rehabilitation program except Tele-practice. Although the concept of self-therapy is not new, the modern world has advanced towards employing technological rehabilitation by incorporating the concept of self-help therapy. Digitalization and research reveal that stutterers in developed countries utilize these applications and acquire benefits like customizable speech practice application for individuals who stutter. The same is used for speech practice of stutters in which written words and sentences are read and listened through audio recordings and practiced (15).

The current study found that tele-practice has positive impact but SLPs professed no “knowledge of digital applications”. The participants revealed “need of digital applications” to be used by those who cannot follow up for regular speech therapy, reside in remote locations and those with psychological issues and history of relapses. A Swedish study revealed similar findings (16). This need is highlighted by the participants of current study.

As regards “App Content” researches have established that technological rehabilitation has been employed for assessment and management (17). The current study participants suggested that application must involve informal assessment and management techniques, be in vernacular or Urdu language along with English, must include breathing exercises and content for speech practice. A participant suggested ‘It will leave a very good impact when it will be in Urdu’.

The participants experiences regarding “stutterers emotional health” revealed that stutterers are unable to speak primarily due to social anxiety making them self-conscious and develop feeling of insecurity leading to depression. Available literature is supportive of findings of the current study that multiple psychological factors affect the adult stutterers and may manifest in form of anxiety, depression, shattering of confidence as well as resentment (18).

Another theme “Factors effecting Stutter’s speech” postulates that multiple factors intensify stuttering including emotional deprivation. The results indicate labelling as a negative attitude of the society as quoted by a participant who explains “We need to be very careful while giving them any diagnosis as it may lead to labelling in our society”. Stuttering carries negative social stigma hence they stress negatively affecting them (19).

The theme “Causes of stuttering” brought numerous etiologies of stuttering in limelight including genetics, negative personal experiences of family and society, mocking, bullying and psychological trauma. Literature defines the etiologies of stuttering as caused by psychological problems however neurogenic stuttering has been reported to be associated with brain damage as a result of cerebrovascular accident (20). Alterations in configuration of brain in terms of anatomy and function including dopamine regulation because of genetic etiology has also been stated in specific circumstances (21).

In the theme “secondary symptoms of stuttering” symptoms like lack of eye contact, using short words and sentences, eye blinking, rapid hand movements were elaborated upon by a participant “They don’t give eye contact, they use secondary behaviors, use bilingual language and shorten

conversation”. This is in compliance to existing literature according to which stuttering is associated with muscle tension and facial grimaces. Head movement, tapping hand and feet and jerky movements are learned by patients to aid in reducing the severity of stuttering yet this may give rise to enhanced fear of communicating (21, 22).

According to the theme “Assessment approach” perspectives observed the speech and psychological assessment. SLPs use stuttering Severity Instrument (SSI) 3 & 4, Syllable per minute, Word per minute and informal assessment as quoted by a participant SLP describing it as “Percentage syllable stutter and other techniques like SSI 3 or 4 is used for assessment mostly”. On the other end of the spectrum and quoted by a participant CP “We assess in two ways namely formal and informal assessment”. Literature also supports the findings of this study that SSI is the prevalent tool of evaluation internationally, however there are other tools too including Speech Efficiency Score and Speech Control Index. (1). Psychologists on the other hand practice with behavioral and anxiety tests, Overall Anxiety Severity and Impairment Scale (OASIS), Depression, Anxiety & Stress Scale (DASS 21) and Diagnostic Statistical Manual (DSM) IV & V. Similarly, literature reveals that psychologists employ a variety of tools and tests for evaluation of stuttering thus the first test psychologists carry out is an anxiety test followed by administration of self-reporting checklist to understand the extent of their speech problem following which they make a plan for the PWS (23).

In the current study, for the theme “therapeutic approach” SLPs mainly focused on speech modification through therapy, fluency shaping exercise, stutter free speech, easy onset, mirror talk and slow and prolong reading. Similarly, according to Beita & Boyle SLPs also use multidimensional approach including fluency shaping, speech modification and stutter free speech that produces quicker and improved results (24). Though in the present study no participant talked about group therapy approach however, in contrast, Everard & Howell reported positive impact of group therapy approach for PWS (25). On the other hand, psychologists use therapies for behavioral and psychological factors. They mostly utilize behavior modification therapy, systematic desensitization, distraction technique, counselling, acceptance and commitment therapy and psycho-education. Quoting a participant CP “Acceptance and commitment therapy works with those having negative self-image of themselves”. With etiology of psychological causes for stuttering, the psychologists mostly focus their intervention on psychological aspects including covert behaviors through Cognitive Behavioral Therapy (CBT) and psycho-education for PWS and their families. Nowadays, the Acceptance and Commitment therapy (ACT) technique has been efficaciously in practice (25, 26).

The theme “contemporary trends of assessment” revealed that SSI and multidimensional approach being used as verbatim described by a participant CP “Even if we look at the West, they have the centers where they have multi-disciplinary teams like psychiatrist, psychologist and SLP work in close collaboration “. Similarly, literature reveals that recent trends indicate that SSI 4 is being commonly employed for assessment without any modifications (27).

The theme “contemporary trends of management” revealed that the combined approach is used with focus on collaboration of speech and psychological therapeutic techniques as an integrated approach. Multidimensional Individualized Stuttering Therapy (MIST) is a contemporary trend combining multiple therapies for improving the Quality of life (QoL) (28).

Apropos the theme “Factors effecting prognosis/Outcomes of therapy” several factors influence the prognosis with most significant being self-motivation and willingness to take the therapy followed by family involvement. As per a participant SLP “Some stutterers have general stresses in their lives which they cannot cope.” Similarly, literature discloses that several factors like personal, familial and frustration can affect PWS (29). Among these factors the social stigmas have significant association with anxiety leading to compromised prognosis and the effectiveness of therapy, while increased frustration leads to increased severity of stuttering and cognitive reactions of the stutterer as a vicious cycle (30).

Conclusion

The speech language pathologists and psychologists in Pakistan utilize almost the same measures of assessment and management as in vogue and practice in the developed countries with certain matters calling for attention. Though well versed about combined approach which is an internationally accepted trend, the Pakistani clinicians are not following it religiously. Lack of awareness of digital applications persists. The pressing requirement for development of such digital applications in vernacular or Urdu language with culturally appropriate norms needs to be emphasized.

Limitations: Approaching and obtaining appointments from the participant SLPs and psychologists keeping in view their busy schedule was the main limitation.

Ethical Considerations:

Ethical issues including informed consent, plagiarism, misconduct etc. have been completely observed by the authors.

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Figure 1: Steps of Thematic Analysis

Table 1: Demographic Characteristics of Sample Population (N=12)

| S. No | Profession | Years of Experience | Qualification |
|---------|------------------------------|---------------------|----------------|
| 1 | Speech Language Pathologists | 9 | Ph.D |
| 2 | | 25 | Ph D (Scholar) |
| 3 | | 16 | Ph.D (Scholar) |
| 4 & 5 | | 10 | MS |
| 6 | | 6 | MS |
| 7 | Psychologists | 20 | Ph.D (Scholar) |
| 8 & 9 | | 16 | MS. |
| 10 & 11 | | 15 | MS. |
| 12 | | 10 | Ph.D (Scholar) |

Table 2: Thematic Analysis: Themes and Sub-Themes (N=12)

| Themes | Sub-Themes | Themes | Sub-Themes | |
|---|--|---|--|---|
| Adult stutter's Emotional state | Confuse, embarrassed & low self esteem | Therapeutic Approach | Speech Modification Therapy | |
| | Discouraged in oral, verbal discussion and communication, hence anticipation of inability to speak | | Fluency shaping Therapy | |
| | Hypersensitive and becomes part of the personality | | Stress buster activities | |
| | Self-conscious of themselves and their speech | Contemporary Trends of Assessment | Counselling and psycho-education | |
| | Depression & anxiety | | Multidimensional approach | |
| | Sympathy | | SSI 4 | |
| | Anger & Resentment | | Percentage syllable stammer | |
| | Feeling of failure & insecurity | | Multidimensional approach | |
| | Mocking | | Combined approach of Therapy | |
| Being odd one out | Contemporary Trends of Management | Factors affecting prognosis/ outcome of therapy | Active participation, level of confidence and sense of accomplishment. | |
| Factors affecting Stutter speech Causes of stuttering | | | Social stigma | Follow ups & patient's concern |
| | | | Personal demotivation | Family involvement |
| | | | Emotional deprivation | Societal awareness |
| | | | Leg pulling, mocking and bullying | History about depression, anxiety and psychiatric illness |
| | | | Negative experience | Low socio- economic status & job-related issues |
| | | | Genetic | Jobs issue |
| | | | Psychological & Social cause | Marital status |
| | | | Familial pattern of speech | Parental expectations |
| | Muscular or Neurological problem | Awareness of Self-help therapy | Aware of Self-help therapy | |
| Emotional trauma | Effective for adult and educated stutters | | | |
| Secondary symptoms | No eye contact | | Learned approach and usually includes Tapping and Prolongation | |
| | Use of Bilingual language | Knowledge about digital Application | No knowledge about the Applications | |

| | | | | |
|---------------------|---|--|--|--|
| | Shortening of conversation | Need / Suggestions for App development | Need to develop the application in both Urdu and English languages | |
| Assessment Approach | Stuttering Severity Instrument (SSI) 3 and 4 | | . | Quick assessment and management |
| | Syllable per minute | | | User friendly and Pocket friendly |
| | Word per minute | | | Facilitates in the continuation of therapy in situations like Pandemic |
| | Informal history taking through questionnaire and parental interview. | | | Use with collaboration of the therapist |
| | Informal, formal assessment and rating scales | Used in case of relapse and for those lives in periphery | | |
| | Behavioral assessment | Content of the App | Reading and verbal reciprocal communication | |
| | Anxiety tests | | History, Daily monitoring charts and alarm option | |
| | Overall Anxiety Severity and Impairment Scale (OASIS) | | Informal assessment and Counselling tutorials | |
| | Diagnostic and Statistical Manual (DSM) | | Therapy according to the severity level including fluency shaping, easy on set tapping method, prolongation, Negative practice, mirror talk can be added | |
| | Depression Anxiety Stress Scale (DASS 21) | | | |